



AGRICULTURE AND FOOD SECURITY MARITIME STUDIES WATER, ENVIRONMENT AND BIODIVERSITY BIOTECHNOLOGY ENERGY
AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT HIV/AIDS, TB AND HEALTH PROMOTION SOCIAL DEVELOPMENT AND
ECONOMIC STUDIES INDIGENOUS AFRICAN KNOWLEDGE SYSTEMS GENDER, RACE AND IDENTITY STUDIES

RESEARCH REPORT 2011



UNIVERSITY OF
KWAZULU-NATALTM
INYUVESI
YAKWAZULU-NATALI

INSPIRING GREATNESS





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PRE-EMINENCE IN RESEARCH

PROFESSOR MALEGAPURU W MAKGOBA

Vice-Chancellor and Principal

Universities have three traditional core missions: research, teaching and learning, and meaningful community engagement.

At university, research informs and drives all three. Firstly, research is paramount for new knowledge production, knowledge identity, knowledge dissemination and knowledge interpretation.

Secondly, university teaching and learning is informed and driven by new knowledge to create a new and high-level teaching.

Thirdly, meaningful community engagement is based on research ideas that are more often solution-oriented.

Therefore, research in its own right is fundamental to the culture of a university.

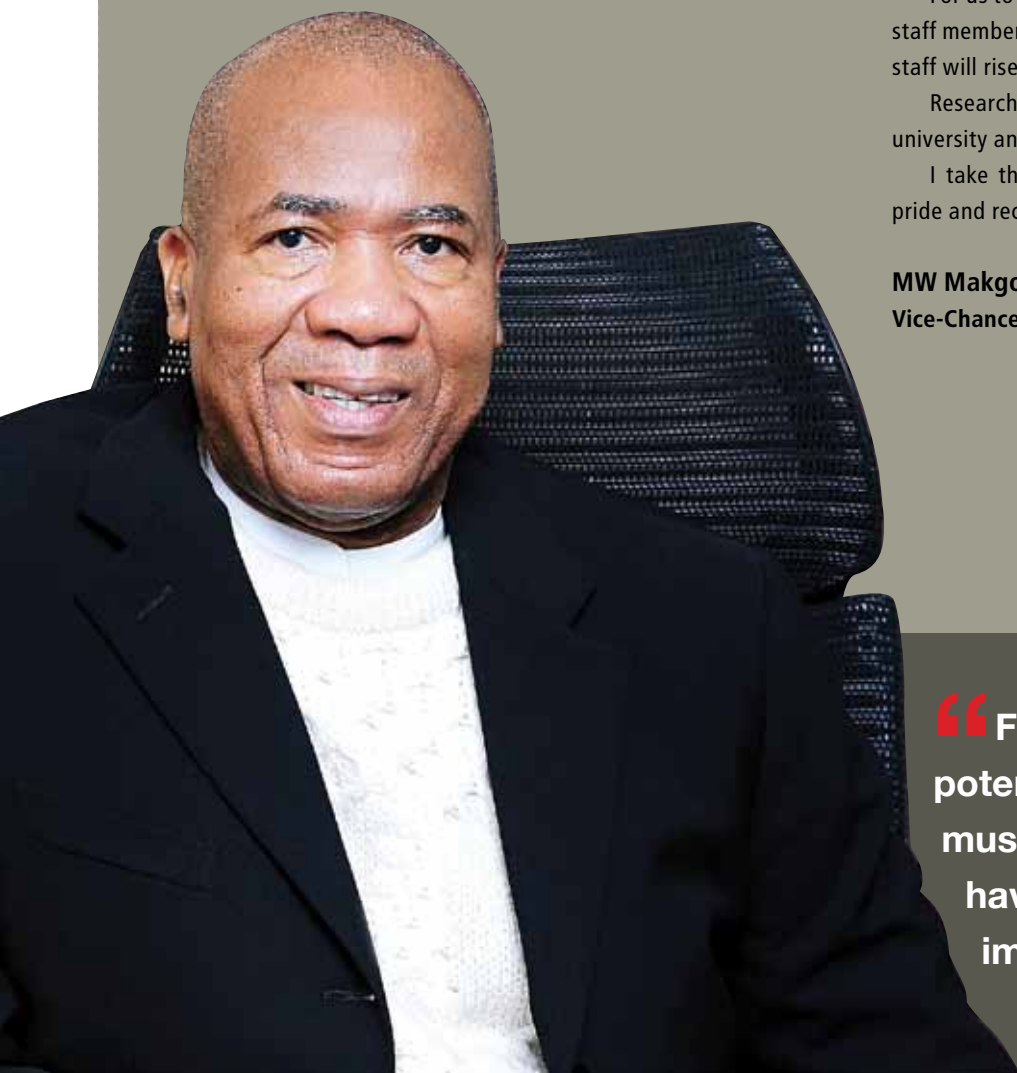
UKZN staff and students have embraced this research ethos. The 2011 report summarises and highlights many aspects of this culture.

For us to reach our full research potential, every academic staff member must play their role adequately. I have no doubt staff will rise to this important and exciting challenge.

Research also generates competitive funds, it brands the university and it brings much-needed reputation.

I take this opportunity to thank all those who brought pride and recognition to UKZN as a research-led university.

MW Makgoba
Vice-Chancellor and Principal



“For us to reach our full research potential, every academic staff member must play their role adequately. I have no doubt staff will rise to this important and exciting challenge.”



SOCIALLY-RESPONSIVE RESEARCH

PROFESSOR NELSON IJUMBA

Deputy Vice-Chancellor: Research

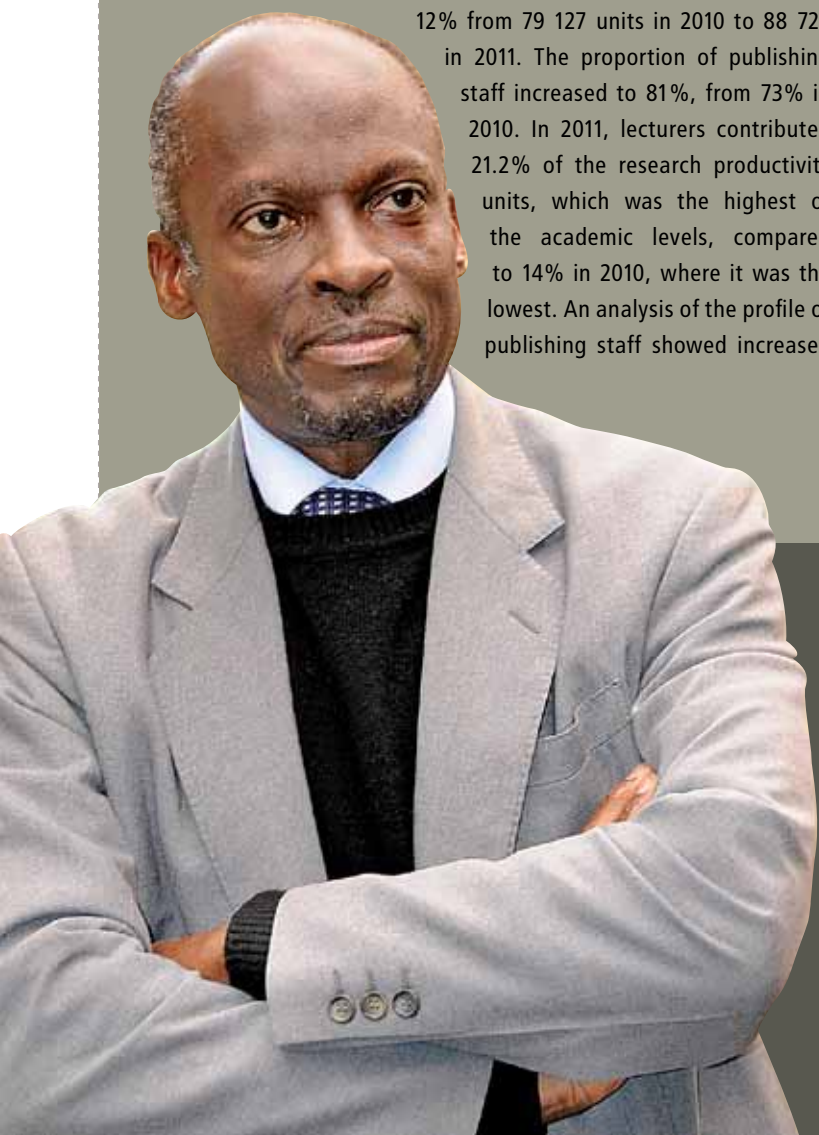
PROFESSOR CHERYL POTGIETER

University Dean of Research

In 2011, UKZN made significant strides in research productivity and research capacity building endeavours. Both the research output and the number of publishing staff, across race and gender lines, continued to increase.

The total number of productivity units increased by 12% from 79 127 units in 2010 to 88 727 in 2011. The proportion of publishing staff increased to 81%, from 73% in 2010. In 2011, lecturers contributed 21.2% of the research productivity units, which was the highest of the academic levels, compared to 14% in 2010, where it was the lowest. An analysis of the profile of publishing staff showed increased

participation of Female and Black researchers. The proportion of female publishers increased from 31.8% in 2010 to 40.7% in 2011. Correspondingly, the proportion of Black researchers increased from 35.6% to 38.2%. In 2011, the majority of the researchers occupying the Top 30 published were below 50 years of age. The above statistics are a clear indication that young and transformed researchers are beginning to make a significant contribution to UKZN's high level of knowledge production and research excellence. The broadening of the base of publishing staff and the increasing participation of female and Black researchers were consequent to a number



“The increasing participation of Black and Female staff in research is a further demonstration that at UKZN, high level knowledge production is progressively moving into the hands of younger and transformed academics.”

of capacity building initiatives by the Directorate of the Postgraduate and Research Capacity Development of the Research Office. These included: writing and publications support workshops, NRF rating workshops, a pre-doctoral training programme, and interventions to assist with costing of funding proposals. By the end of 2011 the directorate had reached over 700 academics. Particularly successful was the paper out workshop, where emerging women academics were paired with a mentor for two days and the contractual obligation was to have a journal article submitted to a journal within a few weeks of the workshop.

The continued excellent performance of UKZN at the national level enhanced its stature as a research-led institution. In 2011, UKZN produced 1 152.02 units of journal publications, which was second highest of the 23 universities in the country, and about 12% higher than the 2010 output. In terms of the weighted research publications, UKZN's output of 1 250.37 units was third highest in the country and about 11.2% of the national total. UKZN was also placed third in terms of publication units for books and for staff who graduated with doctoral degrees. The per capita research output exceeded the national norm, of 1.25 weighted output per staff, by 19% compared to 18% in 2010.

Internationally, UKZN maintained its position in the top 500 of the Academic Ranking of World Universities (ARWU) listing of universities, and was also ranked third nationally and regionally (in Africa).

In 2011, a number of our staff received prestigious appointments and awards. The Vice-Chancellor, Professor Malegapuru Makgoba, received the National Research Foundation (NRF) President's Lifetime Achiever Award and was also elected Vice-President of the International Council for Science. Professor Quarraisha Abdool Karim won the Distinguished Women in Science (Life, Natural and Engineering) Award of the Department of Science and Technology (DST), Professor Pearl Sithole was DST's winner of Distinguished Young Women in Science (Social Sciences & Humanities) and Professor Deevia Bhana was the runner-up in the Distinguished Women in Science (Social Sciences & Humanities) Award of the DST. Ms Karen Pillay and Ms Tricia Naicker were awarded DST doctoral fellowships.

Dr Vincent Nyamori received the Vice-Chancellor's Research Award, which is an honour bestowed on young

researchers for their excellence in research. Professor Peter Alois Dankelmann, Professor Sreekanth Jonnalagadda and Professor Gerald Friedel Ortmann were awarded the University of KwaZulu-Natal Fellowship in recognition of their distinguished contribution to research. Professor Johannes van Staden and Professor Colleen Downs were honoured for being UKZN's top published male and female researchers, respectively.

The number of researchers with an NRF rating increased from 204 (2010) to 213 (2011). The proportion of female NRF-rated researchers increased from 26% (2010) to 28% (2011). Professor Steve Johnson's Chair in Evolutionary Biology and Professor Sunil Maharaj's Chair in Gravitating Systems were



“The Intellectual Property and Technology Transfer Office registered the following four patents in the name of UKZN: Crop Irrigation System, Eitelberg Controller, USAR Electronic and Ball Milling (South Africa). This was twice the number of patents registered in 2010.”

reviewed and confirmed for five more years. Professor Steve Johnson's chair was upgraded to the Tier 1 level and he, along with Professor Pat Berjak, Professor Rob Gous and Professor Michael Chapman retained their NRF A-rated research status.

In 2011, a total of R261 million was received for research grants and contracts compared to R210 million in 2010. In addition, UKZN received a total of R61.6 million through various NRF-funded programmes.

The Intellectual Property and Technology Transfer Office registered the following four patents in the name of UKZN: Crop Irrigation System, Eitelberg Controller, USAR Electronic and Ball Milling (South Africa). This was twice the number of patents registered in 2010.

The number of digitised theses in Research Space increased from 2 472 in 2010 to 4 901 in 2011. The University Library received a positive review by the Quality Promotion and Assurance Unit. As part of modernising its services for increased efficiency, the Medical Campus Library installed the Radio Frequency Identification (RFID) system. It is one of the few libraries in the country to have such a system. Construction of the Research Common space in the Edgewood Campus Library was completed and construction commenced for the Research Common in the Westville Campus Library.

UKZN Press published 21 titles in 2011, five of which were co-publications with foreign scholarly presses while six were authored or edited by UKZN academic staff. Of the books published in 2011, one was recently awarded the 2012 C.L.R. James Award of the Working Class Studies Association. In 2011 *Peace vs Justice? The Dilemma of Transitional Justice in Africa*, edited by Chandra Lekha Sriram and Suren Pillay and published in 2009, won the Choice Outstanding Academic Book of the Year Award. Two UKZN authors were joint winners of the 2011 PanSALB Multilingualism Award in the category of Language and Literature. William Ndayakhe Zulu won the award for his

autobiography, *Liyoze Line Nangakithi*, an isiZulu adaptation of his English autobiography, *Spring Will Come*, which was runner-up in the Sunday Times Alan Paton Award in 2006. Gcina Mhlophe won for her translation of her CD, *Songs and Stories of Africa*, into isiZulu, *Umcelo Nezindaba Zase-Afrika* and isiXhosa, *Umcelo Neentsomi Zase-Afrika*. Both authors were recognised for the important role they play in promoting indigenous languages in South Africa by making these books and CDs accessible to a new and vibrant reading audience.

Mark Hunter's *Love in the Time of AIDS: Inequality, Gender, and Rights in South Africa*, published in 2010, won the 2010 C. Wright Mills Award. The award, which is sponsored by the Society for the Study of Social Problems, is given to the best book in the tradition of Mills that "critically addresses an issue of contemporary public importance, brings to the topic a fresh, imaginative perspective, [and] advances social science understanding of the topic," among other criteria. The award was announced on 20 August 2011.

We would like to congratulate all our researchers for their achievements in 2011. Such accomplishments could not have been possible without the dedication and hard work of all in the research community. The increasing participation of Black and Female staff in research is a further demonstration that at UKZN, high level knowledge production is progressively moving into the hands of younger and transformed academics.

Professor Nelson Ijumba
Deputy Vice-Chancellor: Research

Professor Cheryl Potgieter
University Dean of Research

RESEARCH FOCUS AREAS

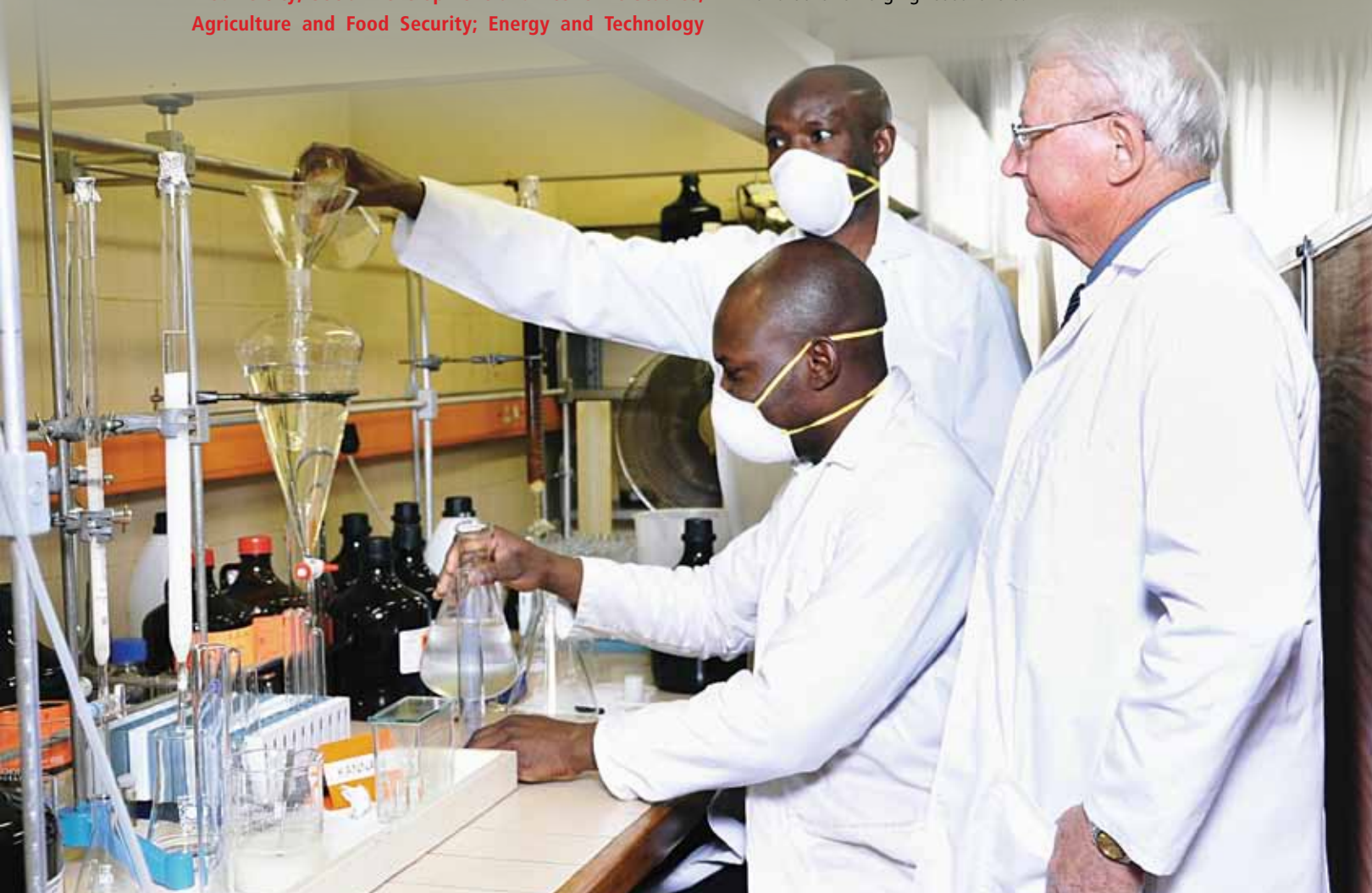
The University of KwaZulu-Natal (UKZN) has identified a number of research focus areas which it believes are critical to supporting its vision, not only as a notable centre of African scholarship in South Africa, but as an integral player in the global partnership embodied in the Millennium Development Goals, which seek to restore a sense of meaningful development to some of the world's poorest countries.

Through sustained research involving multi-disciplinary and cross-border collaborations, the University's efforts are pushing research boundaries, impacting international research trends, and drawing South Africa and Africa into a global network of knowledge production and academic excellence.

Thus our areas of research focus are globally relevant, yet locally responsive and include: **HIV/AIDS, Tuberculosis and Health Promotion; Biotechnology; Water, Environment and Biodiversity; Social Development and Economic Studies; Agriculture and Food Security; Energy and Technology**

for Sustainable Development; Gender, Race and Identity Studies; Indigenous African Knowledge Systems; and Maritime Studies.

In addition, the full spectrum of research – from curiosity-driven to application-based and participatory action research – is undertaken at UKZN, where there is a strong emphasis on teamwork. Senior academics take pride in the mentorship they provide to postgraduate students, postdoctoral scholars and other emerging researchers.



Professor Johannes van Staden, Director of UKZN's Research Centre for Plant Growth and Development with students in the lab.

AGRICULTURE AND FOOD SECURITY

Agriculture and Food Security remain a focus of UKZN's broader research agenda, with University scientists training African plant and animal breeders in Africa and sustaining the critical mass of African expertise required to alleviate hunger on the continent. This research area is a home to several research institutes concerned with eradicating food deprivation and enhancing sustainable livelihoods among the people and nations of Africa, namely the African Centre for Crop Improvement (ACCI), the African Centre for Food Security (ACFS), and Poultry Research. The research in these institutes has led to extensive publications, which in turn resulted in a paradigm shift in the way plants and animals are handled throughout the world.

ACCI, located within the School of Agricultural, Earth and Environmental Science, was established in 2001 to train African plant breeders in Africa in the area of African food security crops. Its vision: African scientists solving Africa's food problems.

The ACCI was initially funded solely by the Rockefeller Foundation but in 2007 the Bill & Melinda Gates Foundation came on board through a consortium known as the Alliance for a Green Revolution in Africa (AGRA) which is funding a second round of five cohorts of 10 students. This brings to more than 80 the number of PhDs in plant breeding that the ACCI aims to train. The focus of the PhD theses is on the applied breeding of key food crops such as sorghum, cassava and cowpeas for increased disease and drought tolerance, and improved yields and quality, with the aim of improving food security in 12 African countries, including Ethiopia, Kenya, Mozambique, Zambia and Malawi.

A key feature of the project is that AGRA has committed itself to ongoing funding of ACCI graduates who continue to breed their chosen food crop, aiming to deliver registered cultivars to farmers. Graduates have started to register a range of new crop cultivars in their home countries.

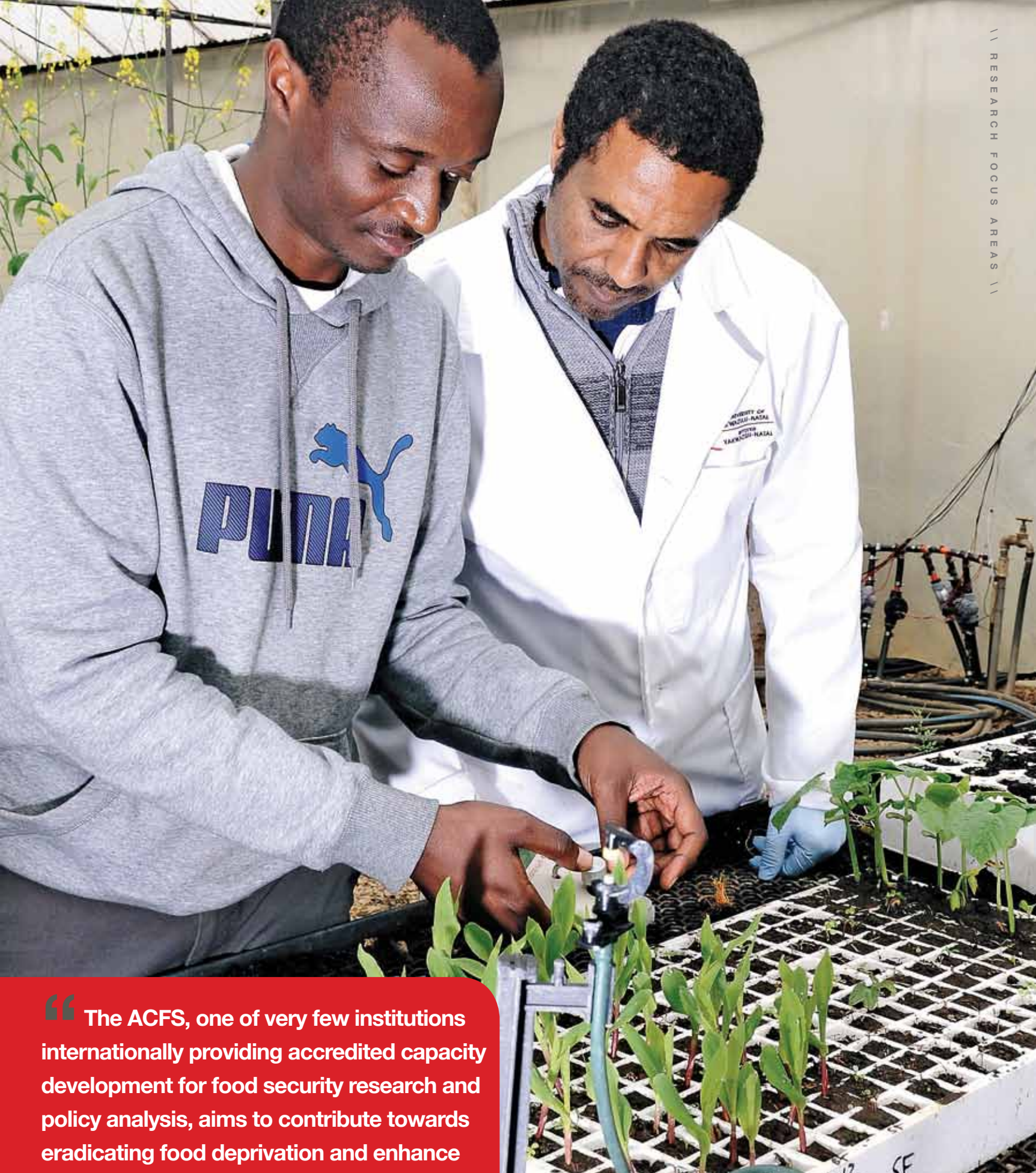
Staff at the ACCI each have their own plant breeding projects, including mutagenesis of sorghum and wheat, development of low phytic and maize using molecular markers, breeding for high beta-carotene maize and the development of biofuel crops. Aware of the growing food security crisis in Africa, the School of Agricultural, Earth and Environmental Science established the ACFS in 2006 to contribute to building and sustaining the critical mass of African expertise required to alleviate hunger on the continent.

The ACFS, one of very few institutions internationally providing accredited capacity development for food security research and policy analysis, aims to contribute towards eradicating food deprivation and enhance sustainable livelihoods among the people and nations of sub-Saharan Africa. Its achievements have been remarkable and include: endorsement by the New Partnership for Africa's Development (NEPAD) as the lead agency in the food security activities of the Comprehensive African Agricultural Development Programme (CAADP) and formal recognition as the Southern African Development Community (SADC) Regional Centre of Excellence for Vulnerability Assessment and Analysis (VAA), including VAA training and coordination. It is one of the few established Food Security Centres in the world to offer trans-disciplinary training, and through UKZN, named degrees in food security. Through its representatives, the Centre played a leading role in the development of the Framework for Agricultural Food Security (FAFS).

UKZN has developed a model that has been taken up by poultry scientists and producers around the world. Research over the past two decades has involved the development of simulation models that predict food intake and growth of broilers and pigs, and reproductive activity in broiler breeders and laying hens. These simulation models have optimised the way in which broilers and pigs should be fed so as to maximise any one of a number of objective functions such as margin over feed cost or feed conversion efficiency.

The research has led to extensive publications on the lighting management of broiler breeders and has resulted in a paradigm shift in the way that these birds are managed throughout the world. As part of its engagement with the community, the Poultry Institute is involved in training prospective poultry managers by providing them with the skills needed to manage people, finances, poultry operations and even themselves.

The Institute has impressive training facilities, including accommodation, lecture rooms, computers and a wide range of ongoing poultry operations, and these are housed on the University's research and training farm, Ukulinga. This Institute has been, and continues to be, highly successful in training students and preparing them for life. This focus area is home to an A-rated National Research Foundation researcher and two recently awarded South African Research Chairs Initiative – Land Use Planning, and Rural Agronomy and Development.



“ The ACFS, one of very few institutions internationally providing accredited capacity development for food security research and policy analysis, aims to contribute towards eradicating food deprivation and enhance sustainable livelihoods among the people and nations of sub-Saharan Africa. ”

Dr Samson Tesfay (right) and Tafadzwa Mabhaudhi, senior researchers working under Professor Albert Modi (Dean and Head of School: School of Agricultural, Earth and Environmental Science) in Crop Science. Their research focus is on underutilised indigenous and traditional crops. Shown here are seedlings of *Moringa olifera*, a crop with huge potential for food security and biofuels.

BIOTECHNOLOGY

Biotechnology is a broad multi-disciplinary area which is defined by the United Nations Convention on Biological Diversity as 'any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use'. Biotechnology has a range of applications in medicine, industry, agriculture, and the environment. UKZN provides a common link to various biotechnology research projects and has a wide curriculum geared to train students in areas of biotechnology ranging from the bio-engineering of industrial yeast for controlled flocculation to biofuel production, mitochondrial enzyme regulation, the development of biomarkers of water pollution in aquatic organisms and an examination of the microbial response to climate changes in soils, and the implications on carbon-cycle feedbacks.

Chemistry: Research areas include organic synthesis, asymmetric catalysis, peptide drug design and computational chemistry. Collaborative research is conducted around the testing of tuberculosis and anti-fungal drugs, and the identification and diagnosis of tuberculosis and radio-labelled imaging agents. Researchers have access to an extensive collection of modern instrumentation – among the best on the African continent – which includes four NMR spectrometers, including 600 MHz with solids probe, and a wide range of chromatographic equipment including GC-MS, LC-MS and MALDI TOF.

“ UKZN provides a common link to various biotechnology research projects and has a wide curriculum geared to train students in areas of biotechnology. ”

Medical Biochemistry: A mini drug discovery platform setup facilitates the conducting of assays for various natural and synthetic compounds to test for cytotoxicity. An evaluation of immunotoxicity using apoptosis assays is also conducted.

HIV/AIDS and TB: A collaborative link with Virology at Inkosi Albert Luthuli Hospital has been established to screen compounds for anti-HIV activity. Currently, the research focus is on using micro RNA species to type serum in patients infected with TB. This has therapeutic potential in infected patients.

Cancer: Novel drug development and screening.

Diabetes: Development of a novel non-genetic animal model for Type-2 diabetes is under way using rats. This research also focuses on the analysis of the chemical composition of several functional foods and medicinal plants and extracts, as well as their effects on non-communicable chronic diseases.

Malaria: To combat the scourge of malaria in Africa, a research team is focused on malaria-related biochemistry, diagnostics, vaccines, metabolism, sequestration, immune-modulation, anti-malarial drug action and potential drug targets. The team is looking at developing new ways to diagnose malaria with a simple and cost-effective dipstick assay. To understand how the disease affects cells of the immune system during a malaria infection and under the influence of anti-malarial drug therapy, an X-Ray microanalysis is used which enables the measurement of minute changes in the concentrations of elements within individual cells. The expression, location and structure of the protein are being studied.

Sleeping Sickness: Research is conducted into Trypanosomiasis, which looks at poultry pathogens and trypanosomes of importance in South Africa and the rest of Africa in order to develop diagnostic assays, therapeutic strategies and, ultimately, vaccines against the diseases caused by these infectious agents. The research focuses on the molecules involved in the binding of the pathogens to their host tissues, antigenic differences between different strains of pathogens and between those of field strains and vaccine strains. Techniques in protein purification and characterisation, immunochemistry and molecular biology are employed.

Stem cell research: Research is conducted involving the regulation of skeletal muscle formation from mouse and human stem cells. The effect of extracellular and growth factors as well as anti-retrovirals (ARVs) on this process is being investigated. In addition, the generation of *in vitro* three dimensional, functional, skeletal muscle is under development.

Techniques used include tissue culture, primary cell isolation, fluorescence and confocal microscopy (including live cell imaging), wound healing assays and standard protein determination methods.

Nano-therapeutics: Research is conducted into the use of nanotechnology in foreign gene delivery (classical and mitochondrial gene therapy), expression and gene silencing mediated by RNA interference. UKZN has a dedicated cell/tissue culture facility which is also actively involved in assays looking at the *in vitro* cytotoxic effects of natural products.

Genetics: Quantitative, population and molecular genetics technologies are employed in unveiling the contribution that genes make to important traits in animals. Molecular techniques are used to examine genetic factors underpinning biological diversity in the field of evolutionary biology. In the field of redox systems biology, the focus is on elucidating how the components in biological systems are integrated to give functional properties.

Microbiology: Research is conducted into the role and function of micro-organisms in a wide range of environmental and biotechnological processes. These include screening for biocatalysts from environmental samples, optimisation of biotechnological processes by artificial intelligence tools, isolation and characterisation of micro-organisms and their secondary metabolites with potential to tackle pathogens, improving beer quality by profiling flavour-active ester compounds in beer under different fermentation and nutritional conditions, and the study of diesel degradation mechanisms by several isolates using real time PCR and proteomic techniques. Screening is performed to isolate micro-organisms with potential for biotechnological applications.

Studies currently under way also include:

Biofuels: Research in this area focuses on the impact of microbial population dynamics on the stability and performance of biotechnological processes employed to generate biogas or bio-hydrogen and an assessment of the potential of organic waste materials for microbiological energy generation. It also includes bio-mining for novel, thermophilic enzymes for lignocelluloses metabolism, cloning in heterologous hosts and enzyme characterisation, construction of lignocelluloses metabolising and ethanol fermenting strains, construction of consortia for lignocelluloses bioconversion to ethanol, and the application of crude enzyme extracts in conjunction with recombinant yeast strains expressing cellulose and xylanase degrading enzymes in order to develop enzyme cocktails to be used in biofuel production from lignocellulosic biomass in consolidated bio-processing fermentations.

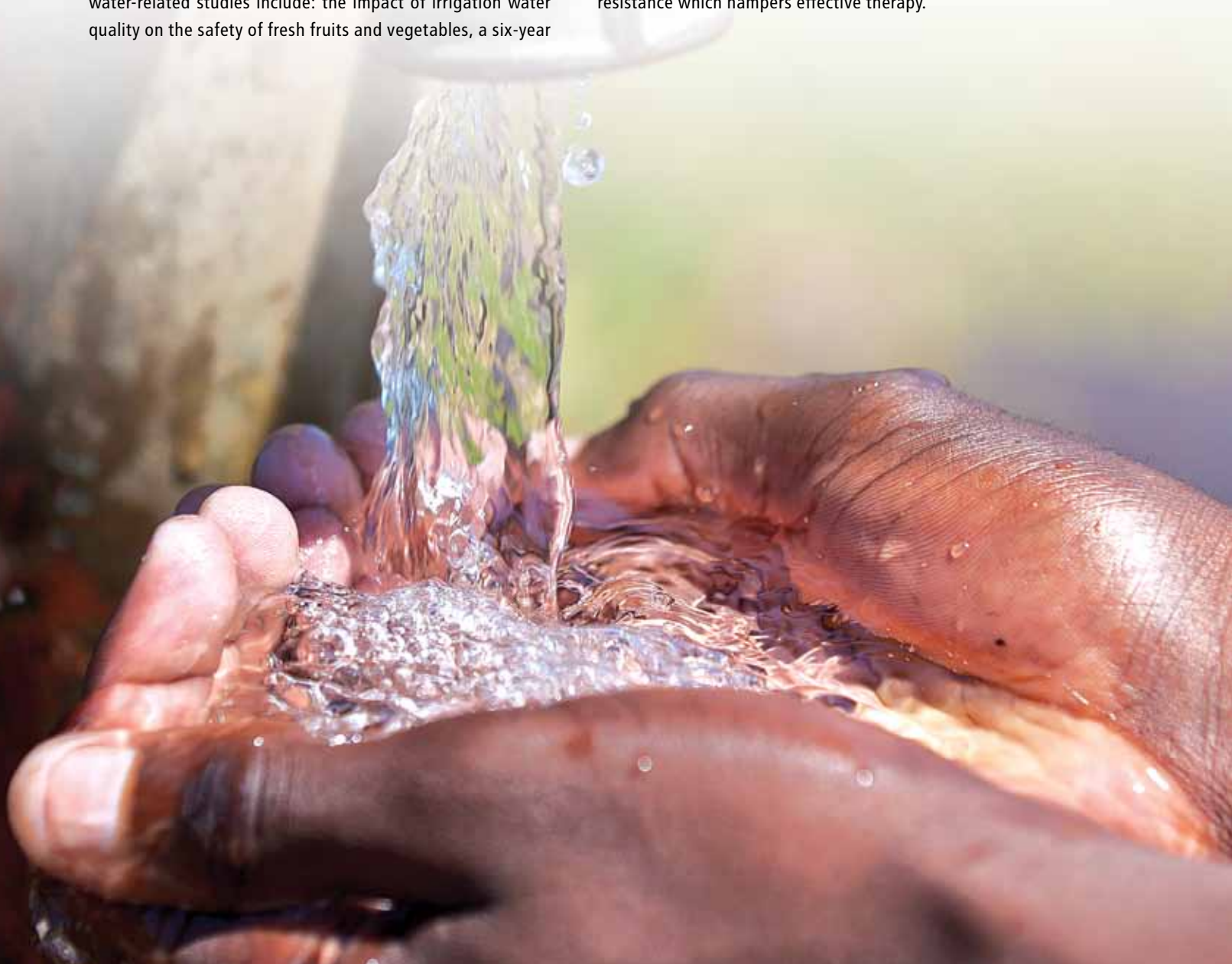
Biopulping: An assessment of seasonal microflora variation and their physical and chemical effects on wood chips for the pulping industry is under way. The aim is the development of strategies to manage chip piles in order to avoid chip deterioration, which leads to reduced pulp yields or inferior pulp quality.

Water quality: This entails examining the biochemical and molecular characterisation of bacteria isolated from waste water treatment plants for chlorophenol degradation. Research focuses on the genomic evolution and adaptation of phenol-degrading bacteria to lethal phenol concentrations. Phenol-degrading isolate increased the phenol tolerance level from 400 mg/l to 800 mg/l and 2.5 fold in degradation rate within a 10-day adaptation period. Studies in a virus evaluation programme of the Umgeni River in Durban showed varying viral abundance along the Umgeni River and many enteropathogenic viruses have been detected.

Other studies demonstrate that bio-competitive exclusion can be used to slow down metal corrosion by supplementing additional nitrogen sources. Studies into the generation and on-site treatment of synthetic grey water for non-potable application are also carried out by the Discipline. Other water-related studies include: the impact of irrigation water quality on the safety of fresh fruits and vegetables, a six-year

collaborative research project with the University of Pretoria; bioremediation of water co-contaminated with chlorinated organic compounds and heavy metals and profiling the microbial population and diversity involved in the degradation processes; and the contribution of heterotrophic micro-organisms to eliminate metal from groundwater.

Also being undertaken is the study of bacterial diseases associated with aquaculture and the ability of the pathogenic bacteria to form biofilms, identifying their antimicrobial resistance phenotypes, identifying alternative strategies to eliminate these micro-organisms, including the use of phytochemicals, identifying the role of quorum sensing in biofilm formation and attempting to inhibit quorum sensing and thus the associated pathogenicity. Additionally, genotyping of these bacterial pathogens is being undertaken, as is a study on the genes associated with antimicrobial resistance which hampers effective therapy.



ENERGY AND TECHNOLOGY FOR SUSTAINABLE DEVELOPMENT

The Energy and Technology for Sustainable Development focus area is providing leading research for the needs of South Africa, in keeping with the mission of UKZN as the Premier University of African Scholarship. The energy sector is by far the largest contributor to global GDP and is the engine that drives the world's economy. Humankind's insatiable appetite for energy has meant that this sector influences all aspects of the economy and has a direct and indirect bearing on the socio-economic development of a country and its people. Research at UKZN in the area of technologies for sustainable development is finely woven into the research being undertaken in the energy sector. The development of technologies for renewable energy, which include fuel production from renewable sources, is a perfect example of this. Research in sustainable technologies also includes environmental sustainability studies which aim to ensure that current industrial processes lead to minimal damage to the environment. In the National System of Innovation, energy security has been identified as one of the 'grand challenges'. Research in the energy sector is not limited to production and distribution of electricity, but also to efficient energy usage, as well as the limitation of the negative environmental effects which are caused by the production and use of energy sources. In this regard there has been a rapidly-growing research interest in improving and developing new technologies for the reduction of carbon dioxide and other greenhouse and flue gases emitted from coal power plants and fuel burning plants.

The University has a number of Institutes and Centres in this focus area which are conducting research in various aspects of energy production and utilisation as well as technology application for sustainable development. Research work on renewable and alternative energy systems and technologies such as solar and wind, as well as biofuels and conversion of municipal waste to natural gas for electricity production, is being conducted by multi-disciplinary teams in the College of Agriculture, Engineering and Science. One of the pillars of this initiative is the Integrated Renewal Energy Advancement Programme (IREAP) which is a partnership between UKZN, engineering company Karebo Systems, the Department of Trade and Industry, the Industrial Development Corporation of South Africa (IDC), the Technology and Human Resources for Industry Programme (THRIP), and other relevant partners for

the development of a strategy for fundamental research into renewable energy.

This research focus area is also the home base for three technology based South African Research Chairs Initiatives (SARChI). The Chairs are the Quantum Information Processing and Communication Chair, which is at the frontier of applying quantum mechanics to develop new technologies in the areas of quantum cryptography and quantum computing; the Fluorine Process Engineering and Separation Technology Chair, which supports the South African Fluorochemical Expansion Initiative (FEI) and will aid in the development of a substantial fluorochemical industry in the country; and the recently awarded Chair in Intelligent Real Time Power Systems, which will focus on optimised utilisation of energy sources in an integrated power system.

There are a number of Units and Centres in this focus area which are conducting research in various aspects of energy production and utilisation as well as technology application for sustainable development. Some of the Units have been established through close research collaborations with major industries such as ESKOM and SASOL. The partnership with ESKOM has resulted in massive investment in research and the establishment of state-of-the-art facilities such as the High Voltage Direct Current (HVDC) Centre and the Vibrational Research and Test Centre (VRTC). The facilities are for research on improved equipment and system performance of electricity

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transmission and distribution networks. Sustainable manufacturing and chemical production is an area of strength in the School of Engineering, with large research groupings in Mechanical and Chemical Engineering respectively. The Thermodynamics Research Unit in the School of Engineering is a SASOL Centre of Excellence in Chemical Thermodynamics and undertakes research into the improvement and optimisation of chemical and separation processes for SASOL. Partnerships also exist with major players in the telecommunications industry, with a centre of excellence in this area in partnership with Telkom and Alcatel-Lucent in the Discipline of Electrical, Electronic and Computer Engineering.

Research in Mechatronics and Robotics for Advanced Manufacturing Systems at UKZN has focused on Reconfigurable Manufacturing Systems (RMS), autonomous mobile robots and quality control systems for Advanced Manufacturing environments. The research uses the concept of 'system integration' to achieve the desired outputs and results.

Reconfigurable Manufacturing Systems research has included topics such as reconfigurable machine design and materials handling for mass produced custom products. Research in autonomous mobile robots has focused on navigation, guidance, mobile robot cooperation, differential drive operational dynamics and optimised material handling routing. Research in quality control for Advanced Manufacturing systems has produced designs, assemblies and results that validate research objectives for part inspection and recognition. Research and development has also produced a human transporter robot platform, autonomous robot bird, low cost Mechatronic vehicle simulator, an amphibious robot for search and rescue operations as well as in overhead transmission lines maintenance.

GENDER, RACE AND IDENTITY STUDIES

This focus area draws on multiple disciplines within the University to examine the ways in which identities are constructed, created and consolidated. These disciplines draw on several frameworks for engaging with issues of race and gender, among other social categories such as age, sexuality and class. In the context of health inequalities, AIDS, gender and sexual violence, the focus area of Gender, Race and Identity Studies provides important conceptual tools to address how social structures which arise in history are reproduced but are also open to change.

The research is strongly influenced by contemporary critical theories which question the framing of power inequalities. Gender, Race and Identity Studies focuses on the dynamism and intersections of social inequalities and the vulnerabilities and anxieties of those belonging to groups usually constructed as powerful, as well the agency of those belonging to groups usually seen as lacking power. The focus area thus locates itself by initiating serious and difficult debate, and by researching alternative routes to creating a society that is non-racial and simultaneously and measurably moving towards greater equality than that which is currently experienced by all South Africans. The focus area is a home to the Centre for Critical Research on Race and Identity (ccrii), which is dedicated to facilitating the study of race thinking and changing identities so as to improve understanding of, and stimulate public dialogue about, the epistemological, moral, cultural and other bases for perceptions of human diversity and difference.

Many of the initiatives in this focus area are housed in the College of Humanities. The following are some of the key programmes:

Postgraduate and Research Programme in Gender and Education: Making schools safer, more peaceful and more egalitarian, the Gender and Education programme examines how educators and learners interact, how they construct their gender identities and how schools operate. This postgraduate programme has trained many Masters and PhD students to address ongoing challenges (including violence in schools), and approaches to achieving Gender Equity.

Postgraduate and Research Programme in Gender and Religion: Patriarchy and sexism are very evident in South Africa within a web of other oppressions such as racism and poverty. These oppressions often find overt and covert justification from within religion and culture. At the same time, it is acknowledged that religion and culture can

also provide plausible structures as a means to overcome oppression. This seemingly dialectic tension is explored through research and the sharing of knowledge from such research within the Gender and Religion programme, which has not only produced many Masters and PhD graduates but has also produced research that has gained national and international prominence as the only formalised programme in Gender and Religion offered in Africa.

“This focus area thus locates itself by initiating serious and difficult debate, and by researching alternative routes to creating a society that is non-racial and that is simultaneously and measurably moving towards greater equality than that which is currently experienced by all South Africans.”

HIV/AIDS, TUBERCULOSIS AND HEALTH PROMOTION



As the pre-eminent academic institution at the epicentre of the HIV epidemic in South Africa, UKZN has taken up the challenge of providing leadership in response to HIV and AIDS and Tuberculosis (TB), and is undertaking ongoing research to enhance scientific capacity in these critical areas and strengthen the biomedical and broader societal response to the epidemic. UKZN's focus on HIV/AIDS, TB and Health Promotion is a multi-faceted and multi-disciplinary initiative, involving a number of established research groups and projects which recognise the importance of rigorous scientific inquiry aimed at, for example, an understanding of the pathogenesis, virology, immunology and epidemiology relating to HIV/AIDS, or the role of breastfeeding in mother-to-child HIV transmission and the facilitation of clinical trials for treatment of HIV and TB in both children and adults. The focus area is home to an A-rated NRF Researcher and SARCHI Chairs in Indigenous Health Care Systems, and Systems Biology of HIV/AIDS.

UKZN continues to attract international recognition for its groundbreaking research in both HIV and TB prevention and treatment. At a global level, UKZN strives to nurture international institutional partnerships such as its long-standing relationship with the universities of Columbia and Harvard, both in the United States. In recognition of its standing as a world-class research centre in HIV/AIDS and Tuberculosis, the University has successfully attracted significant funding from influential international organisations such as the Howard Hughes Medical Institute (HHMI), the Wellcome Trust, the US National Institutes for Health (NIH), the US Agency for International Development (USAID), and the European Union (EU).

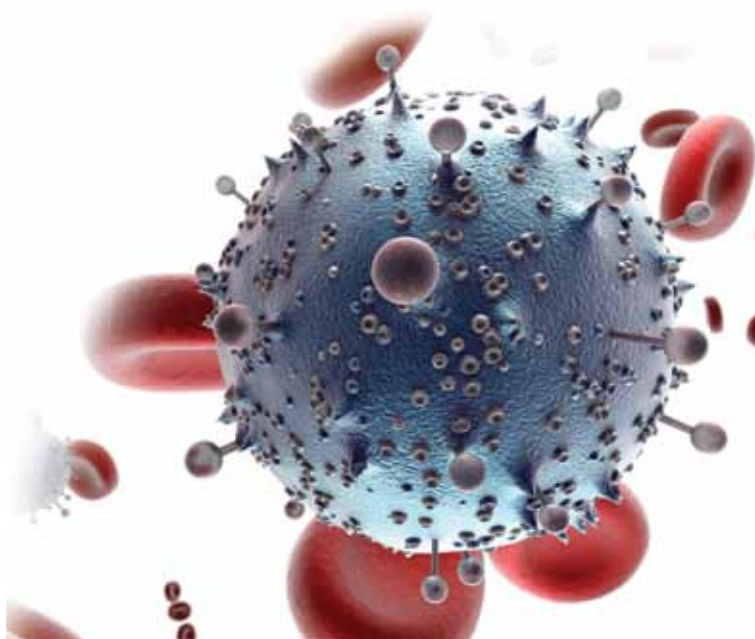
Major research centres and institutes include: the Africa Centre for Health and Population Studies; the Centre for the AIDS Programme of Research in South Africa (CAPRISA); the KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH); the Enhancing Care Initiative; and HIVAN, the HIV Pathogenesis Programme (HPP) and the Health Economics and HIV/AIDS Research Division (HEARD). CAPRISA is a designated UNAIDS collaborating centre for HIV prevention research.

Through the Columbia University-Southern African Fogarty AIDS Training and Research Programme, the institution is committed to building scientific capacity in HIV/AIDS and tuberculosis research in several countries in Southern Africa to enhance continuing efforts to counter the HIV/AIDS and TB epidemics. Over the years the programme has trained many of South Africa's young AIDS and TB researchers.

At the same time, however, this research cluster does not neglect the socio-economic implications and impact of diseases such as HIV/AIDS and TB. Thus, there is significant

emphasis on research into the ethics, law and human rights issues as they relate to the administering of AIDS vaccines through the Ethics, Law, Human Rights (ELH) programme, and the HIV/AIDS Vaccine Ethics Group (HAVEG). The broad socio-economic impacts of AIDS are examined through the Health Economics and HIV/AIDS Research Division (HEARD), and the research around the role of indigenous health care systems in addressing the epidemic is conducted under the leadership of a Chair in Indigenous Health Care Systems.

“ There is significant emphasis on research into the ethics, law and human rights issues as they relate to the administering of AIDS vaccines through the Ethics, Law, Human Rights (ELH) programme, and the HIV/AIDS Vaccine Ethics Group (HAVEG). ”





MARITIME STUDIES

The primary research focus in this area is Marine Science and Coastal Engineering, the secondary being Climate Change – Prediction models, adaption strategies; Air quality analysis and modelling in urban areas; Analysis and design of renewable energy systems – wave, wind, currents; Analysis and mitigation of natural hazards – floods, droughts, dispersion of toxic gases; Catchment management – erosion/sediment yield, soil moisture mapping, remote sensing, modelling; and Management of urban water reticulation networks and storm water systems.

The aim is to achieve significant scientific advances in the analysis and modelling of human impacts on productive aquatic ecosystems, including threatened estuarine systems, addressing issues of sustainability, increased pollution, flow reductions, and widespread degeneration of the functioning of these critical ecosystems. The main innovation targeted in the research is the effective integration of physical dynamics with ecosystem responses in a way that is appropriate for encapsulating understanding of their functioning into

predictive models for application to sustainable management.

Overall, the scientific importance of the activities of the research groups within this area is embedded in its focus on developing new insights and understanding of the structure, functioning and sustainable management of critical productive hydro-ecosystems, using theoretical, computational and field-based research techniques to develop insight and understanding of flows in the natural environment. This work is done through multi-disciplinary teams using an integrated approach to understanding and modelling physical and biological systems.

Marine Science and Coastal Engineering

UKZN research in Coastal Engineering is led by the eThekweni Municipality Chair in Civil Engineering and a Professor of Hydraulics and Environmental Fluid Mechanics at the School of Engineering. The Metro, UKZN and TU Delft (TUD) in Holland, one of the top 20 universities in the world, are collaborating on research in Coastal Engineering.



TUD are partners in the University's SANPAD-funded research projects at St Lucia estuarine lake. One of the most significant aspects of this research initiative, and that of the postgraduate students, is the unique and innovative collaboration with Biological and Conservation Sciences. This partnership sees engineers working hand-in-hand with biologists on the ecosystem functioning of Lake St Lucia, one of the world's critically important estuarine systems which is part of the iSimangaliso World Heritage Site. Since 2004, academics have worked on developing an integrated biophysical model for the entire estuarine system. The primary research focus aims to achieve significant scientific advances in the analysis and modelling of human impacts on productive aquatic ecosystems, including threatened estuarine systems – addressing issues of sustainability, increasing pollution, flow reductions, and widespread degeneration of the functioning of these critical ecosystems. The main innovation targeted in the research is the effective integration of physical dynamics with ecosystem responses in a way that is appropriate for encapsulating understanding of their functioning into predictive models for application to sustainable management.

Maritime Studies

Maritime Studies has been identified as a potential Research Focus Area for UKZN, based on historical activities in this area as well as the University's strategic location on the Eastern Seaboard. Research and studies are geared towards the utilisation of the resources of the ports and the sea for socio-economic benefits. The Unit for Maritime Studies focuses on the following academic areas: International Business Transactions and Supply Chain Logistics, International Trade Economics, Maritime Economics, International Taxation, Customs and Excise Taxation, Maritime Law and Commerce and Ship and Marine Environment Management.



INDIGENOUS AFRICAN KNOWLEDGE SYSTEMS

A review conducted in 2009 by a team of external and internal experts on Indigenous African Knowledge Systems (IAKS) capacity at UKZN, revealed that the University has great capacity and potential in terms of active researchers and publications on IAKS in its various units. In line with the institutional vision 'to be a Premier University of African Scholarship' and promoting Africa-led globalisation, UKZN has identified IAKS as a strategic focus area for research, teaching and community engagement. Taking into consideration the holistic and multi-disciplinary nature of IAKS, the scope of research undertaken in the field is comprehensive. Researchers are engaged in collaborative research work locally, nationally and internationally in areas of:

- (i) **Indigenous African Agriculture and Food Security.** This includes the use of wild food resources and Postharvest Technologies in the context of natural resource and disaster management systems for climate change adaptation and mitigation. Researchers in these areas investigate the behaviours of living organisms providing early warning systems, taboos and totemic systems as indigenous environmental protection mechanisms.
- (ii) **Traditional African Medicine** which involves working with traditional healers in the identification and screening of medicinal plants for the treatment of various community ailments, smoke research for conservation, cultivation and improving chemical constituents of indigenous medicinal plants. The scope of research in this area is wide – there are more than 3 000 medicinal plants presently traded and used in African traditional medicine – and ranges from the pharmacological screening of coniferous plants such as the *African Podocarpaceae* and the pharmacological potential of plants from the *Orchidaceae* family, to investigations of

the effect of storage on the phytochemical composition and biological activities of certain Southern African medicinal species. Other areas of research include the study of medicinal plants traditionally used for the treatment of stomach ailments; the isolation of the antibacterial compounds from *Erythrina caffra*; the study of medicinal plants used by the Venda communities to treat venereal disease and plants used to treat diarrhoea; and the efficacy, safety and pharmacological properties of commercial herbal mixtures which are an increasingly popular form of African traditional medicine. Studies are also being undertaken to compare the anti-microbial activity of bulb versus leaf extracts of certain plants so as to reduce the threat to species that comes with the increasing harvesting of bulbs. Work has also started on the phytochemical makeup of *Cyrtanthus contractus*, a member of the family Amaryllidaceae, from which the commercial Alzheimer drug Galanthamine has been produced.

- (iii) **Indigenous African Approaches to Conflict Management and Transformation.** This includes investigation into actors, principles and mechanisms and their applicability in modern times within the context of culture, gender and human rights.
- (iv) **Traditional African Leadership and Governance Systems.** Here researchers investigate the nature and characteristics of Traditional African institutions; issues of legitimacy, democracy and accountability; and traditional African institutions and modernity (challenges and prospects).
- (v) **Indigenous Knowledge Systems and Creative/Cultural Industries,** especially with regard to promoting indigenous community enterprises for employment creation and income generation among vulnerable social groups (women, the youth and people living with disabilities).
- (vi) **Indigenous African Languages** where researchers investigate issues involving the diversity of indigenous African languages and their impact on development policy, language demographics, linguistic features of indigenous African languages, among other issues.

The issue of gender and language is crucial in all these IAKS research areas at UKZN due to the centrality of African women and language in African communities.

“The scope of research is wide – there are more than 3 000 medicinal plants presently traded and used in African traditional medicine.”

SOCIAL DEVELOPMENT AND ECONOMIC STUDIES

The primary objective of this area of research is to strengthen and enhance applied and policy-relevant research in the fields of Economic Development, Finance, Sociology, Development Studies, Economic History, Agri-Business, Cultural and Heritage Tourism, and Health Economics.

Some of the leading research undertaken in this focus area delves into urban-rural economic and livelihood inequalities in South Africa and continues to ask what the relationship is between the growth and spatial distribution of the public and private economic sectors. It also explores the interface between households and labour markets in South Africa, advancing knowledge across a range of socio-economic areas, including those relating to marriage, migration, child care, household survival strategies and resource sharing, and labour force participation and employment.

The research encompasses the formal and informal economy, the nature of poverty, the characteristics of the poor, areas and socio-economic empowerment. This research is integral to evaluating the experiences of economic development among individual South Africans and to assessing economic and social policy that seeks to reduce poverty and increase well-being.

The focus area is a home to SARCHI Chairs in Economic Development, and Applied Poverty Reduction Assessment. The Centre for Civil Society (CCS) deals with issues falling into this focus area. Its main objective is to advance socio-economic and environmental justice by developing critical knowledge about, for and in dialogue with civil society through teaching, research and publishing. The research focus area covers social issues in education and is home to the JL Dube Chair in Rural Education.



WATER, ENVIRONMENT AND BIODIVERSITY

UKZN's strength in the area of Water, Environment and Biodiversity is based on innovative and cutting-edge disciplinary science and is evident in its internationally recognised researchers with active research programmes and postgraduate students in related fields, plus several ongoing research projects supported by local and international funders.

The research is centred on improving the understanding and functioning of the natural environment, biological and man-made environmental resources, their sensitivity to human influences and the development of tools through which this knowledge can be applied for effective environmental resources management and planning.

The activities in this area form the focus of a multi-disciplinary team of engineers, biologists, political scientists and community medical professionals, and have included participation in international research projects. In addition to large research groups in this area, there are several other multi-disciplinary initiatives, notably working on wetlands,

soil erosion, community interactions and sanitation, estuary-related research, and water and public health, working closely with other stakeholders, including local communities.

UKZN has wide and varied expertise and experience in water-related teaching, research and outreach activities throughout South Africa and in many parts of Africa and beyond. The research focus area draw on a range of academics and students from all the University's Colleges and most of its Schools.

UKZN's strength in the field of water is evident in its nationally and internationally recognised researchers with active research programmes and postgraduate students in water-related fields, and several ongoing research projects supported by local and international funders. These projects and the contribution of the University's graduates have resulted in UKZN being recognised as one of the leading institutions in water-related research and training in South Africa and internationally.

Hydrology: Research is centred on improving our understanding of the functioning of the hydrological cycle, its



sensitivity to human influences and the development of tools through which this knowledge can be applied for effective water resources management and planning.

Within this context, hydrology research is conducted within the following areas: agricultural water use and innovation in irrigation practices; water related aspects of land use change; hydrology process studies; hydrological aspects of climate change and forecasting; and the hydrological model and database design and development.

Development of tools and practices to assist in the implementation of South Africa's National Water Act and the management of the country's water resources is an outcome of these studies, but the Research Group is also active in regional, continental and global initiatives. One of the more notable outputs from this group is the Agricultural Catchments Research Unit's Agro-hydrological Modelling System, a software system that is being used as a research and management tool for water resources planning and operations in South Africa and provides a foundation for several ongoing research projects. Projects completed recently include a revised Agro-hydrological Atlas for South Africa, and tools to estimate the water use of commercial afforestation in South Africa, both of which are now used by the Department of

Water Affairs and Forestry in water licensing and regulation.

Waste, Water and Sanitation Management: As a result of a Memorandum of Agreement signed between the eThekweni Municipality's Water and Sanitation Department and UKZN, the University's Pollution Research Group (PRG) has expanded its activities into municipal water and waste water management. These activities form the focus of a multi-disciplinary team of engineers, biologists, political scientists and community medical professionals, and have included participation in two European Union research projects related to membrane bioreactors and the identification and dissemination of best practice of water and sanitation supply to un-served communities. Sanitation projects are being undertaken on pit latrines and urine diversion toilets. Collaborative research on the anaerobic baffled reactor process includes internationally recognised projects being undertaken by the non-governmental organisation Borda, which is working in South-East Asia and Africa. Research for the Water Research Commission and SASOL is ongoing.

The Pollution Research Group recently received a R2.8 million grant from the Bill & Melinda Gates Foundation to fund its toilet technology and sanitation research, the aim of which is to design a toilet system that will lead to the safe disposal of waste water in



Mr Alistair Clulow, PhD student, installing equipment in a Cabernet Sauvignon block as part of the FruitLook project.

poor communities. UKZN was one of eight institutions – and the only one in Africa – chosen out of 22 to take part in the ‘Reinvent the Toilet’ challenge. UKZN’s revolutionary system placed sixth at the Reinvent the Toilet Fair held in the United States. UKZN’s toilet was designed to burn waste solids while re-routing urine to a storage tank where it would be decontaminated, purified and repurposed for flushing and hand-washing.

Micrometeorology and Agrometeorology: Investigations are conducted into the energy and water balances between the soil, plants and atmosphere through the Soil-Plant-Atmosphere Continuum Research Unit (SACRU), which specialises in micrometeorology and agrometeorology. This internationally recognised research unit has a major research thrust in the investigation of energy and water balances and emphasises the use and development of methods for the measurement of evaporation, sensible heat and, more recently, carbon dioxide fluxes above land surfaces. Most of this research is funded by the Water Research Commission.

Hydrological Engineering: The way in which engineering interacts with the natural environment and can be used to promote sustainable practices is consolidated in research conducted by the Centre for Research in Environmental, Coastal, and Hydrological Engineering (CRECHE). Projects include the management of landfill emissions, the dispersion of pollutants in the atmosphere and coastal waters, spatial rainfall modelling and estuary bio-hydrodynamics.

The Centre also conducts leading national research into radar-rainfall relationships and flood forecasting through its Satellite Applications and Hydrology Group (SAHG).

Limnology: Biological limnology research, with particular focus on man-made lakes and integrated catchment management, is concentrated in the School of Biological and Conservation Studies. Members of the Grassland Science Group collaborate with communities in the Upper-Thukela on a pilot ‘Payment for Environmental Services’ project funded by the Department of Water Affairs and Forestry. Here, indicators for the payment of water services are developed and tested.

Applied research into and management of water resources, decision support tools for estuaries, fresh water management and water conservation are conducted by the Institute of Natural Resources, an associate institute of UKZN. In addition to these larger water research groups there are several other initiatives, notably working on wetlands, soil erosion, community interactions and sanitation, estuary-related research, and water and public health. The research work has received substantial funding from the Water Research Commission, the Ford Foundation, the European Union and Dutch and Swedish Development Agencies.

The Smallholder System Innovations (SSI) Research Project

This flagship research project cuts across and involves all UKZN groups. An applied and development-oriented research programme, it aims at advancing knowledge on how to balance water for food and the environment with a particular focus on upgrading smallholder rain-fed agriculture in water-stressed catchments. The multi-disciplinary research programme encompasses biophysical and social research themes, Grassland Science and the University’s Farmers’ Support Group, with the researchers working closely with other stakeholders, including local communities at two pilot catchments (Potshini and Makanya) in two river basins (Thukela and Pangani) in South Africa and Tanzania respectively.

The project is being implemented jointly by five research institutions: Sokoine University of Agriculture (Tanzania); Stockholm University (Sweden); the UNESCO-IHE Institute for Water Education (The Netherlands); the University of KwaZulu-Natal; and the International Water Management Institute. Funded by the Dutch and Swedish governments, the programme – notwithstanding its development orientation – is based on innovative and cutting-edge disciplinary science.

Biodiversity: Research in this area is conducted in a number of research institutes and units such as the Research Centre for Plant Growth and Development which does research on plants concentrating on several focus areas: ethnobotany and traditional African medicines; plant biotechnology, where efforts are made to increase plant production and the synthesis of secondary products of medicinal value; plant hormone physiology and the regulation and control of growth processes to increase plant production; smoke technology where studies are made of the regulation of plant growth by fires and their products; microalgae and their effect on higher plant growth and potential use as biofuels. Other research institutes and units include plant germplasm conservation research on cryopreservation and seed storage; the Centre for African Parrot Conservation; and the Unit on Plant Pollination Biology, which is devoted to research on evolutionary diversification of plants. This study area is a home to two NRF A-rated researchers and a SARChI Chair in Evolutionary Biology.

Plant germplasm conservation research focuses on recalcitrant seeds, which are enduringly desiccation-sensitive, short-lived and representative of many over-exploited plant species, a large proportion of which are threatened.

Work carried out which first established the high international profile of this research group, firmly established the basis of recalcitrant seed behaviour, as being a consequence of unabated active metabolism, the fine details of which

are presently the subject of ongoing projects. Parameters facilitating short- to medium-term storage of recalcitrant seeds have been optimised on a species-basis, and presently research is directed on means to eliminate seed-associated fungi which seriously curtail storage life spans. Long-term conservation of the germplasm of recalcitrant-seeded species is achievable only by cryopreservation, usually in liquid nitrogen (-196°C). This is impossible for intact seeds, thus the use of excised embryonic axes is a major research focus. The procedures, however, have been identified to be accompanied by oxidative stress, which seriously compromises successful production of plants from cryopreserved material.

A major break-through from current research aimed at ameliorating oxidative damage, is the innovative application of the reducing power of the cathodic fraction of electrolysed water, which has afforded not only success, but avoids the use of chemical anti-oxidants, which themselves are potentially toxic. The Centre has recently completed a basic document commissioned by the FAO, setting the standards for conservation of the germplasm of recalcitrant-seeded species.

The parrot family contains the largest number of threatened and endangered species of birds in the world. In addition to field studies, laboratory research has addressed issues of eco-physiology, behaviour and systematics, leading to many scientific publications and conference presentations.



LEADING RESEARCH CENTRES

AFRICA CENTRE FOR HEALTH AND POPULATION STUDIES

Based at Somkhele in the Umkhanyakude sub-district of rural northern KwaZulu-Natal and at the Doris Duke Medical Research Institute at the University's Medical School campus, the Africa Centre conducts community-based research on HIV epidemiology, prevention and treatment.

The Centre, led by Professor Marie-Louise Newell, receives core funding from the UK-based Wellcome Trust, with additional funding from a variety of donors, for specific projects. Its mission is: to conduct policy-relevant health and population research, in an ethical manner, in partnership with the community in which it works and to enhance the capacity of sub-Saharan Africa to do research. As a Wellcome Trust-funded site, it adheres to the principles of open access and broad collaboration in the pursuit of excellence and the subsequent impact on health and population science.

The main focus of research done by the Centre – whose research resources include a large socio-demographic and economic surveillance with household visits and additional HIV and health surveillance – is to chart the impact of the HIV epidemic at ground level. The Centre partners with the local Department of Health in the Hlabisa HIV Treatment and Prevention Programme to provide AIDS treatment to thousands of patients at 17 primary health care clinics in the district.

The institution has investigated trends in adult mortality before and after the introduction of the HIV treatment programme, showing a significant decline in overall population mortality and HIV-related adult mortality following ART roll-out, in a high HIV prevalence community.

Research at the Centre has also shown a decline in early (0-2 years) and overall (0-5 years) childhood mortality, partly due to the roll-out of the Prevention of Mother-to-Child Transmission (PMTCT) Programmes and the reduction in the number of HIV-infected children but mostly due to the survival of HIV-infected women on treatment.

Voluntary Counselling and Testing (VCT) services are widely available, making it quick and easy for anyone to go to a clinic or VCT site for a free and confidential HIV test.

The research output from the Centre, together with the experience from the HIV treatment and care programme, have formed the basis for the Treatment-as-Prevention Trial, which aims to evaluate in a random fashion whether HIV treatment at the point of HIV diagnosis will prevent onward transmission and reduce the HIV incidence in the population. The first phase for this trial is funded by the French ANRS.

One of the Africa Centre's latest research projects is a study on the impact of concurrent sexual partnerships on the rate of new infections in a high prevalence, rural South African

“The main focus of research done by the Centre is to chart the impact of the HIV epidemic at ground level. The Centre partners with the local Department of Health in the Hlabisa HIV Treatment and Prevention Programme to provide AIDS treatment to thousands of patients at 17 primary health care clinics in the district.”

population. Several international institutions were involved in the study, including the Department of Global Health and Population at the Harvard School of Public Health in Boston, United States.

The results were published in *The Lancet* in an article which said concurrent sexual partners were widely believed to be one of the primary drivers of the HIV epidemic in South Africa. This view is supported by theoretical models which predict that increases in the level of concurrent partnerships could substantially increase the rate at which disease spreads.

However, the impact of concurrent partnerships on HIV incidence has not been appropriately tested in a sub-Saharan African setting.

The study found no evidence to suggest that concurrent partnerships are an important driver of HIV incidence in this typical rural African population. Findings suggest that in similar hyper-endemic sub-Saharan African settings, there is a need for straightforward, unambiguous messages aimed at the reduction of multiple partnerships irrespective of whether or not those partnerships overlap in time.



Staff at the Africa Centre for Health and Population Studies.

AFRICAN CENTRE FOR CROP IMPROVEMENT (ACCI)

The establishment of the African Centre for Crop Improvement (ACCI) in 2001 was made possible with financial support from the Rockefeller Foundation in the United States. This was followed in 2007 by funding from the Alliance for a Green Revolution (AGRA), a consortium of the Bill & Melinda Gates Foundation and the Rockefeller Foundation.

ACCI's vision is: Training African Plant Breeders in Africa, to increase Food Security in Africa by breeding better crop varieties.

Since 2002 the ACCI has trained 43 PhD students to graduation, and another 40 PhD students are 'in the system' being trained at present. Discussions are underway about the training of subsequent cohorts of students.

The students are from nine countries in East and Southern Africa, including Ethiopia, Rwanda and South Africa. They are each breeding one of 20 African food security crops, including rarely studied crops such as durum wheat, finger millet and tef.

The students spend two years of academic training at UKZN before returning home to undertake three years of field research, using conventional and biotechnological tools of plant breeding.

A key feature of the project is that AGRA has committed itself to ongoing funding of ACCI graduates, who continue to breed their chosen food crop, aiming to deliver registered cultivars to farmers.

The ACCI graduates have started to register a range of new crop cultivars in their home countries, such as new bean varieties in Malawi that are resistant to weevils, and cassava clones in Kenya that are virus-resistant and drought tolerant. The staff and students have published 87 research papers in international journals to date.

The ACCI, based on the Pietermaritzburg campus in the School of Agricultural, Earth and Environmental Sciences, is headed by Professor Mark Laing whose research interests include plant breeding, biological control agents and the use of silicon in agriculture.

ACCI staff members each have their own plant breeding projects including mutagenesis of maize and sorghum, development of low phytic acid maize using molecular markers, breeding for high beta-carotene maize (for Vitamin A) and the development of biofuel crops, especially sweet stem sorghum and tropical sugar beet.





“The ACCI graduates have started to register a range of new crop cultivars in their home countries, such as new bean varieties in Malawi that are resistant to weevils, and cassava clones in Kenya that are virus-resistant and drought tolerant.”

THE AFRICAN VISION RESEARCH INSTITUTE (AVRI)

The African Vision Research Institute (AVRI) is an African-based institute which links intellectuals, institutions, organisations and other personnel in the pursuit of confronting and dealing with the challenges of Africa's eye health issues.

The organisation is led by Professor Kovin Naidoo, an Associate Professor at the University of KwaZulu-Natal, IAPB Chair for Africa and the Global Programmes Director for the International Centre of Eyecare Education (ICEE).

AVRI was conceived and initiated during a World Health Organization (WHO) meeting on Global Eye Research in Geneva, when the need was identified for an institute to enhance research capacity on the African continent by developing a cadre of trained researchers through workshops, research activity and publications.

AVRI aims to reduce the burden of blindness in Africa by encouraging research activity among African scientists which is relevant to the control of eye diseases, human resource development and infrastructural capacity enhancement for increased eye care service delivery. The mission of the Institute is to develop research capacity and appropriate skills in an effort to eliminate visual impairment and avoidable blindness in Africa in support of VISION 2020 – the Right to Sight campaign initiated by the WHO and IAPB in 2000. This global campaign draws stakeholders involved in eye care

to escalate and coordinate efforts towards eliminating avoidable blindness in the world by the year 2020.

The Institute is affiliated to the University of KwaZulu-Natal, with both organisations having a commitment to growing vision and eye research on the African continent.

In addition to undertaking research, AVRI currently provides training in research methods; offers technical and logistical support on a range of research projects; assists postgraduate students to become skilled researchers and research writers; assists authors to communicate effectively and scientifically; promotes, undertakes, and sources journal articles, funding and information; and promotes the publication of research findings. Additionally, the Institute aims to disseminate research-related information to interested African researchers through its website, newsletters and publications.

AVRI also provides holistic support to postgraduate research projects, including assistance with writing protocols and proposals; advising on methodologies; designing of surveys/questionnaires; layout and content of conference abstracts, posters and presentations; sourcing publications and documents for research projects; and data entry and analyses in the form of descriptive reports.

Thus far, the Institute has made in-roads into developing linkages in East and West Africa and is currently pursuing North-South collaborative partnerships to strengthen the delivery of its mandate.

The fact that there are 517 million people in the world who are visually impaired because they cannot afford a pair of spectacles sparked international research involving AVRI. The World Health Organization convened a panel to develop a protocol to quantify the problem in specific locations as well as to determine the impact on the quality of life and the importance that individuals place on near vision. AVRI was designated to conduct the study in KwaZulu-Natal with Naidoo as a member of the panel.

The study was initially conducted in 2009 in the Inanda, Ntuzuma and KwaMashu areas of KwaZulu-Natal with a follow-up study in 2011 to determine the change in near vision correction as well as the level of continued usage of spectacles among those prescribed with spectacles in the initial phase.

In the initial phase, 1 939 adults over the age of 35 were examined after being enumerated and administered through a questionnaire. More than 80% of the subjects had uncorrected near vision impairment. Of all the study sites globally, Durban had the highest unmet need of 93.5% in terms of near vision spectacles.



Professor Kovin Naidoo.

ASTROPHYSICS AND COSMOLOGY RESEARCH UNIT (ACRU)

The Astrophysics and Cosmology Research Unit (ACRU) based at UKZN is headed by Professor Sunil Maharaj.

The broad goals of the Unit are to:

- Promote research in astrophysics and cosmology, thereby advancing the understanding of the universe and the diverse range of structures it contains.
- Increase awareness of astrophysics and cosmology by informing the public of the latest developments in these fields.

The Unit aims to achieve these goals by:

- A strong research programme centred on academic staff, postdoctoral researchers, postgraduate students, affiliated researchers and visitors.
- Regular colloquia, technical seminars and journal club meetings, as well as the organisation of larger workshops and conferences.
- Stronger links with local institutions and collaborations with leading international research groups. The Unit identifies strongly with the recognition of astronomy as a focus area in South Africa.

The South African Government continues to be a major partner in the operation of the South African Large Telescope (www.ska.ac.za/nSALT) and was a strong supporter in the successful South African bid to host the Square Kilometre Array (www.ska.ac/nSka).

The Unit is making sufficient scientific contributions to various projects associated with these facilities as well as the national endeavour to advance astronomy.

The recent awarding of the major component of the R26 billion Square Kilometre Array (SKA) mega radio telescope to South Africa will open doors to a wealth of new knowledge and the promise of exciting new job and study opportunities.

Researchers at the Astrophysics and Cosmology Research Unit have been working closely with the South African SKA Project (SASKAP) since its inception nearly a decade ago and now host a node of the SASKAP astronomy undergraduate bursary programmes that will train the next generation of South African astronomers.

The SASKAP postgraduate bursary programme has previously funded three doctoral and two masters students who have graduated through their cutting-edge research in

astrophysics and cosmology supervised by ACRU researchers. Currently, two doctoral students and one masters student at UKZN are working on SASKAP-funded research.

Masters student Ms Kenda Knowles has been recruited by SASKAP to work with their commissioning team on data from the Karoo Array Telescope KAT-7 (a radio array comprising seven dishes) precursor instrument. Knowles is interested in studying the growth of galaxy clusters, the most massive objects in the universe held together by gravity, by measuring the radio waves that are given off in rare but highly energetic collisions between these objects.

ACRU researchers, Dr Caroline Zunckel and Professor Kavilan Moodley, are closely involved with several key MeerKAT (the extension of KAT-7 to 64 radio dishes i.e., 'More' KAT) projects that will come online in the next few years.

Zunckel is participating in the MeerKAT International Giga-Hertz Tiered Extragalactic Exploration (MIGHTEE) project, that will study the growth of supermassive black holes located at the centres of active galaxies, and the MeerKAT Absorption Line Survey (MALS) project, that will study the build-up of stars from the reservoirs of hydrogen gas contained in galaxies.

She has initiated a close collaboration with the principal investigators of the MALS project to train UKZN students to work on data from this project.

Moodley is playing a key role in the Looking at the Distant Universe with the MeerKAT Array (LADUMA) and Pulsar Timing Array (PTA) projects, which have been awarded the largest fractions of MeerKAT observing time. He is leading a LADUMA science working group that will study the rotational motions of galaxies through the radio waves given off by the hydrogen gas that they contain.

He is also leading the PTA science working group that will study the gravitational ripples created in the fabric of space and time only moments after the Big Bang.

CENTRE FOR THE AIDS PROGRAMME OF RESEARCH IN SOUTH AFRICA (CAPRISA)

CAPRISA is a multi-institutional team led by Professor Salim Abdool Karim, undertaking research on HIV epidemiology, pathogenesis, prevention and treatment.

Established in 2002 under the NIH-funded Comprehensive International Programme of Research on AIDS (CIPRA) by five partner institutions – the University of KwaZulu-Natal, University of Cape Town, University of the Western Cape, the National Institute for Communicable Diseases, and Columbia University in New York – CAPRISA has since become a designated UNAIDS Collaborating Centre for HIV Prevention Research.

CAPRISA's main goal is to undertake globally relevant and locally responsive research which contributes to understanding HIV pathogenesis, prevention and epidemiology as well as the links between tuberculosis and AIDS care.

To achieve this goal, CAPRISA conducts research in four main scientific programmes:

1. **Prevention and Epidemiology.** Studies at the rural Vulindlela Research Centre near Howick have provided a detailed understanding of the epidemiology, risk factors and vulnerability to high rates of HIV infection in young women in South Africa.
2. **Microbicides.** The CAPRISA 004 trial of the tenofovir gel microbicide provided the proof-of-concept evidence that antiretrovirals can prevent HIV infection in women.
3. **HIV Pathogenesis and Vaccines:** The CAPRISA 002 Acute HIV infection study has generated new data on how viral and host factors impact on the risk of HIV and its natural progression as a key contribution to vaccine development and testing.
4. **HIV and TB treatment:** The CAPRISA 003 SAPIt trial provided critical evidence for WHO guidelines on how to treat patients with HIV and TB co-infection.

CAPRISA researchers published 44 peer-reviewed journal publications in 2011, several in high impact journals such as *The Lancet*, *New England Journal of Medicine*, *Nature*, *AIDS* and the *Journal of Virology*. Nine CAPRISA journal articles reached the milestone of more than 100 citations with the

most highly cited article reaching 616 citations – more than one citation a day since it was published in 2010.

CAPRISA has made substantial contributions to addressing some of the challenging clinical management issues associated with TB-HIV co-infected patients. Results from the CAPRISA 003 trial on the optimal timing for initiating antiretroviral therapy (ART) in HIV-TB co-infected patients has shown that survival was significantly improved in patients who received integrated treatment instead of sequential treatment – 5.4 deaths per 100 person-years as compared with 12.1 per 100 person-years.

Results from this trial have been incorporated into the WHO international guidelines on the treatment of TB and HIV co-infection, the US government DHHS guidelines for treating HIV and TB co-infection and the South African guidelines for treatment of TB-HIV co-infected individuals. Most recently, the PEPFAR Scientific Advisory Board recommended that ART be offered to all patients with HIV-related tuberculosis (TB), irrespective of CD4+ cell count, and integrate ART during TB treatment.

Awards to CAPRISA staff in 2011 include:

- President's Award for Outstanding Achievement in World Health (to the CAPRISA 004 Leadership Team) from the Drug Information Association for research on the tenofovir gel microbicide;
- Research leading to Innovation Award (to Quarraisha and Salim Abdool Karim on behalf of the CAPRISA 004 Leadership Team) from the South African National Science & Technology Forum jointly with BHP Billiton in recognition of the contributions to HIV prevention through the CAPRISA 004 study;
- Science-for-Society Gold Medal Award (to Salim Abdool Karim) from the Academy of Science in South Africa in recognition of excellence in the application of outstanding scientific thinking in the service of society;
- Distinguished Woman in Science Award in the Life, Natural and Engineering Sciences for 2011 (to Quarraisha Abdool Karim) from the South African government Department of Science and Technology in recognition of her contributions to science broadly but specifically for the CAPRISA 004 tenofovir gel trial.



“CAPRISA’s main goal is to undertake globally relevant and locally responsive research which contributes to understanding HIV pathogenesis, prevention and epidemiology as well as the links between tuberculosis and AIDS care.”

CENTRE FOR CRITICAL RESEARCH ON RACE AND IDENTITY (ccrri)

The Centre for Critical Research on Race and Identity (ccrri) is primarily a research unit. It was created and functions to initiate and facilitate research and to collaborate with others in the execution of research projects and related activities.

The Centre focuses in the first instance on South Africa, but not as a unique site for the issues it confronts. The problems and opportunities that present themselves here demand local research, theorising and recommendations but also benefit from other insights and comparative research and can contribute to initiatives elsewhere.

By leading a transdisciplinary research agenda and building durable scholarly capacity, the ccrri aims to inform public understanding, stimulate constructive dialogue, and guide policy in relation to race thinking and changing identities in societies in transition. The approach is to use South Africa as

a complex, multi-layered backdrop to study and offer practical solutions to local and global issues of race and identity.

The goal of the ccrri is to contribute towards social justice and tolerance of human difference and to confirm that which humans share in South Africa and elsewhere.

“ The ccrri aims to inform public understanding, stimulate constructive dialogue, and guide policy in relation to race thinking and changing identities in societies in transition. ”



Pictured at the Symposium on Classification (The power of abstraction and classification: changing practices and varied consequences) held from 1-4 February 2011 are (from right to left) Gerhard Maré, Dvora Yanow and Philomena Essed.

CENTRE FOR QUANTUM TECHNOLOGY (CQT)

Professor Francesco Petruccione, Professor of Theoretical Physics, was awarded an Innovation Fund grant in 2005 to set up a Centre for Quantum Technology (CQT) and in 2007 was granted the South African Research Chair for Quantum Information Processing and Communication (QIPC).

The Centre is working on a theory of open quantum systems which is at the basis of many recent quantum technological applications. The miniaturisation of technological devices necessitates manipulation of objects at the nanoscale level at which coherent quantum mechanical processes start to dominate the physical properties.

The unavoidable interaction of these systems with their environment gives rise to dissipative mechanisms and a strong loss of quantum coherence, i.e. decoherence. Since perfect isolation of quantum systems is not possible, it is of central importance to incorporate the methods and tools of the theory of quantum systems in the exploration of quantum technologies.

Among the basic tools of the new quantum technologies are quantum metrology, quantum control, quantum communication and quantum computation.

CQT was involved in the deployment of quantum-secured communication solutions at the Moses Mabhida Stadium during the 2010 FIFA World Cup. The project catapulted South Africa into the global race of Quantum Information Processing

and Communication (QIPC).

The European Union and the *Scientific American* (Japan) recognised the project as a major milestone towards the market acceptance of QIPC. Building on the Quantum City initiative, the CQT and eThekweni Municipality again partnered to provide a quantum cryptography security solution to one of the most crucial links of Durban's ICT initiatives during the World Cup.

The Quantum Stadium Project encrypted the link between the Moses Mabhida Stadium and eThekweni's offsite Joint Operations Centre housing the SA Police Force, Emergency Services and National Intelligence. The link secured telephone, internet, video, data and e-mail traffic travelling across the fibre optic link. It was the first time that quantum cryptography had been applied to secure an event of global relevance.

The development of the Quantum Stadium Project from the proof-of-concept experiments in a laboratory environment to the fruition of the technology during the World Cup demonstrated the ability of the CQT to engineer solutions from inception and support them throughout the innovation cycle.

In 2011 the Group was awarded an NRF Research Infrastructure Support (RISP) Grant to purchase a state of the art Clavis 2 Quantum Key Distribution system that will allow it to keep up with ground breaking research in quantum communication.



HEALTH ECONOMICS AND HIV/AIDS RESEARCH DIVISION (HEARD)

Since 1998, HEARD has grown under the leadership of Professor Alan Whiteside to become a well-established unit with several international and local projects investigating the socio-economic impact of AIDS.

The Division conducts applied research and runs development interventions aimed at mobilising evidence for impact in health and HIV in SADC countries and in the east Africa region.

HEARD supports UNAIDS in Africa, the SADC Secretariat and the Parliamentary Forum and African leadership in responding to issues of health and HIV.

HEARD's overall objective is to improve private and public sector understanding of the socio-economic impacts of HIV/AIDS through its applied research.

Its aims are to promote multi-sectoral responses to the impact of HIV/AIDS, to develop the practice of Health Economics throughout Africa and developing countries, and to train business and community leaders, professionals and government officials in strategic planning for the management of HIV/AIDS.

HEARD is a UNAIDS Collaborating Centre that continues to play a leading role in research on the nexus between AIDS and economics.

In 2011 HEARD was involved in a study into medical male circumcision (MMC) in schoolboys.

While MMC is seen as an effective prevention strategy against HIV/AIDS, sexual risk compensation in relation to

male circumcision is still largely unknown. Risk compensation is referred to as 'the phenomenon whereby those who have taken protective steps offset the benefit with other behavioural changes' (Hallett, *et al.*, 2008, p. 4).

In the case of MMC, the protective effect of the circumcision may be negated by engaging in risky sexual practices such as decreased condom use and increased number of (concurrent) partners. In order to address this research gap, HEARD partnered with CAPRISA to undertake a study examining the issue of risk compensation in an adolescent school-going cohort in the high HIV prevalence sub-district of Vulindlela near Howick in KwaZulu-Natal.

By tracking a cohort of adolescents post circumcision, the study investigated the effect of medical circumcision on sexual behaviours in this community as MMC was scaled up. At the end of December 2011, the study group completed the development of psycho-behavioural measures, obtained general ethical approval for the study and developed a logistics plan for it.

The study has implications for how the scale-up of MMC should be considered, and more generally 'treatment as prevention' programmes in the region. The results of this study will provide some insight on how risk compensation may be addressed and minimised within programmatic sexual and reproductive health interventions in a school going population.



Under HEARD's Research Programme, the Young Carers KZN project has been a partnership between HEARD, the University of Oxford, Brown University, the South African national government and the National Action Committee for Children Affected by AIDS (NACCA). This study is part of a larger national project, Young Carers SA, that aims to inform policy and programming in order to improve the wellbeing of children and families. The Young Carers SA study provides a cutting edge example of research planned for maximum impact and uptake among decision makers. It is the world's first large scale quantitative study of the impacts of familial HIV and AIDS on children, and has been developed and conducted in close collaboration with South African national government departments and NGOs.

KWAZULU-NATAL RESEARCH INSTITUTE FOR TUBERCULOSIS AND HIV (K-RITH)

Intensive research into tuberculosis (TB) and HIV/AIDS – which could yield significant breakthroughs within a few years in the diagnosis, prevention and treatment of these killer diseases – is underway at UKZN thanks to a multi-million rand grant from the Howard Hughes Medical Institute (HHMI) in the United States.

The grant, the biggest ever for medical research in South Africa, is being used to:

- Establish the KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH);
- Construct a R308 million building for the institute on the grounds of the Nelson R Mandela School of Medicine in Durban; and
- Fund TB and HIV research at UKZN for the next 10 years.

The Institute, which aims to be one of the most sophisticated of its kind in the world, will offer state-of-the-art facilities for researchers and students from across the African continent.

K-RITH is led by Professor William Bishai, and includes a number of eminent scientists from around the world.

K-RITH is breaking new ground in genome science with the K-RITH Genomics Web Portal (www.k-rithgenomics.com), a website that houses K-RITH's genome data, the particular genetic information (genomes) of individual mycobacteria

(the bacteria that cause tuberculosis), and provides access to user-friendly bioinformatics tools.

The K-RITH Genomics Web Portal utilises 'cloud' computing through the powerful server infrastructure of IBM and Amazon Web Services to enable students and researchers alike to remotely analyse large datasets quickly and at little cost over the internet.

K-RITH is also already planning to integrate its portal with other projects and collaborating laboratories and to incorporate existing bioinformatics tools from other labs into its platform.

The NIH and the Broad Institute are two such partners who are co-operating with K-RITH and UKZN to sequence the genomes of 1 000 bacterial samples collected from patients with tuberculosis in South Africa, helping to make South African scientists global leaders in TB genomics. When completed, this portal will comprise the largest single, publically available cache of tuberculosis genomics data in the world.

This project is a dramatic step forward in the study of tuberculosis. By making the genomics space more open and accessible, K-RITH hopes to promote collaboration among TB research scientists and accelerate the bioinformatics assessment of TB by focusing attention on drug resistant forms of TB abundant in KwaZulu-Natal.



Professor William Bishai, Director of K-RITH.

POLLUTION RESEARCH GROUP (PRG)

The Pollution Research Group (PRG), led by Professor Chris Buckley, was established in 1973 as a self-funded contract research group within the Department of Chemical Engineering at the then University of Natal to investigate problems around industrial water management in South Africa.

The group has expanded its activities into municipal water and waste water management as a result of a Memorandum of Agreement between the eThekweni Municipality's Water and Sanitation Department and UKZN.

An agreement has been signed whereby the Municipality provides financial support – R1 million a year for five years – to the PRG which in turn provides scientific support to the Water and Sanitation Department.

These activities form the focus of attention of a multi-disciplinary team of engineers, biologists, political scientists and community medical professionals and have included participation in two European Union research projects related to membrane bioreactors and in identifying and disseminating best practice of water and sanitation supply to unserved communities.

Sanitation projects are being undertaken on pit latrines and urine diversion toilets. Collaborative research on the anaerobic baffled reactor process includes internationally recognised projects being undertaken by the NGO BORDA in South-East-Asia and Africa (BORDA has been announced as the International Water Association's 2011 research award winner).

In 2008/2009, a UNEP-UNIDO project on the water

efficiency in African Breweries was successfully completed, while a new project to provide background information for the permitting of industrial waste water flowing into domestic sewage works was initiated. Ongoing research for the Water Research Commission and SASOL is continuing.

Two Water Research Commission-funded projects on the management of pit latrines sludge were undertaken by the PRG and Partners in Development in 2011 to understand and quantify sludge accumulation in pit latrines and disposal options for sludge dug up out of pit latrines. These were:

- Understanding the sludge accumulation in on-site sanitation systems and strategies to manage desludging in the future when pits are full.
- Investigating the potential of deep row entrenchment of pit latrine and waste water sludges for forestry and land rehabilitation purposes.

It was found that the rate at which a pit latrine fills is dominated by the amount of material added and the fraction of the material that is biodegradable. The single biggest factor that can be manipulated to reduce pit-filling rates is the provision of an effective solid waste management system in the community to reduce the incidence of non-degradable material entering the pit latrines.

A range of methods for dealing with pit latrine sludge were investigated.



Professor Chris Buckley, who heads up the Pollution Research Group at the University, is surrounded by initiatives geared to improve waste water management. Photo: Ruth Cottingham



“ An agreement has been signed whereby the Municipality provides financial support – R1 million a year for five years – to the PRG which in turn provides scientific support to the Water and Sanitation Department. ”

SOUTH AFRICAN RESEARCH CHAIRS INITIATIVE (SARChI)

The University has the following 11 South African Research Chairs, an initiative of the Department of Science and Technology and the National Research Foundation:

- Economic Development
- Evolutionary Biology
- Fluorine Process Engineering and Separation Technology
- Quantum Information Processing and Communication
- Gravitating Systems
- Systems Biology of HIV and AIDS
- Applied Poverty Reduction Impact Assessment
- Indigenous Health Care Systems
- Land Use Planning and Management
- Intelligent Real Time Power Systems
- Rural Agronomy and Development



ECONOMIC DEVELOPMENT

Professor Dori Posel
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Professor Dori Posel is an economist who specialises in the micro-econometric analysis of household survey data. Her Research Chair in Economic Development is located in Development Studies in the School of Built Environment and Development Studies.

Posel obtained her PhD in Economics from the University of Massachusetts in the United States in 1999. She has been the recipient of numerous awards for her research and has published widely on questions of migration, marriage, labour markets and socio-economic indicators of well-being.

The overall research objective of the Research Chair in Economic Development is to explore the interface between households and labour markets in South Africa, advancing knowledge across a range of socio-economic areas, including those relating to union formation, mobility, child care, household survival strategies and resource sharing, labour force participation and employment.

The research is integral to evaluating the experiences of economic development among individual South Africans and to assessing economic and social policy that seeks to reduce poverty and increase well-being.

Posel is also using the opportunities afforded by the Research Chair both to strengthen quantitative research skills in the analysis of South African micro datasets, and to foster inter-institutional research on socio-economic issues.

During 2011, she introduced the MASA conference. MASA – the Micro-Econometric Analysis of South African data – brings together national and international researchers who work with South African micro data.

The conference provides a forum for the presentation of new and ongoing micro-econometric research in various areas, including education, labour, welfare and poverty, demographic economics, health and social capital. Given the success of MASA 2011, the conference will be held regularly, and plans for MASA 2012 are well underway.

Posel's recent research investigates specific characteristics of the post-apartheid period in South Africa, including: the temporary nature of labour migration; marriage and cohabitation in the context of bride wealth payments; the determinants of subjective well-being or happiness; and relations of trust among South Africans.

A key project undertaken during 2011 investigated the economics of language. Although the majority of South Africans are African mother-tongue speakers, English and, to a lesser extent, Afrikaans are the main languages of business.

Posel's research used recently released micro data to explore measures of adult literacy, the relationship between home language and English language proficiency, the returns to these language abilities in the South African labour market, and the implications for language policy.

Her research finds that among Africans, English language proficiency is highly rewarded (more so than home language proficiency) in the South African labour market, a finding which helps explain why English is viewed as the language of success and why parents want their children to study in English. However, her research also shows that South Africans are more likely to be proficient in English if they are also able to read and write very well in their home language.

This finding is consistent with a large body of literature which argues that the acquisition of second-language skills is best supported through the acquisition first of home language skills during schooling.



EVOLUTIONARY BIOLOGY

Professor Steve Johnson
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Prominent academic and researcher Professor Steve Johnson of the School of Biological and Conservation Sciences was awarded the Research Chair in Evolutionary Biology for a five-year period.

His research in the field of evolutionary biology focuses on plant pollinator interactions. The interactions between flowers and their pollinators are not only important for seed production of wild plants and crops but have also been instrumental in the evolution of the spectacular diversity of the world's flowering plants. He has recently developed a strong interest in the role of floral volatiles in mediating specialised plant-pollinator interactions, and has established a state-of-the-art laboratory for the study of chemical clues used by plants to attract insect pollinators.

Johnson has contributed significantly to the understanding of the evolutionary diversification of plants in southern Africa and also the ecological requirements that plants have for their reproduction.

Johnson has published more than 200 peer-reviewed scientific papers, co-authored two books, and has also written many popular science articles.

He is currently on the editorial boards of two international journals, *Oecologia* and *Arthropod-Plant Interactions*, and was guest editor for a special edition of the *South African Journal of Botany* in 2009. He received the National Research Foundation (NRF) President's Award in 1999 and currently holds an A-2 rating from the NRF.



“Professor Johnson has contributed significantly to the understanding of the evolutionary diversification of plants in southern Africa and also the ecological requirements that plants have for their reproduction.”

FLUORINE PROCESS ENGINEERING AND SEPARATION TECHNOLOGY

Professor Deresh Ramjugernath
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Professor Deresh Ramjugernath is the DST/NRF South African Research Chair for Fluorine Process Engineering and Separation Technology and also Director of the Thermodynamics Research Unit at UKZN.

Ramjugernath leads a large team of postgraduate students and researchers – arguably one of the leading research groups in its field globally – which undertakes cutting-edge research contributing towards chemical process development and optimisation in South Africa and abroad.

The group actively contributes to the Government's Fluorochemical Expansion Initiative (FEI) by researching and developing South Africa's fluorinated products with its activities being integral to the development of a fluorochemicals industry in the country and directly linked to the South African Nuclear Energy Corporation (NECSA) and SASOL. Although South Africa possesses the second largest reserves of fluorspar (the starting material for all fluorochemicals), it currently imports almost all of its fluorinated products. There is very little beneficiation of the fluorspar reserves in the country and the activities under the Chair

assist in addressing the problem by developing technology and human capacity to drive the development and expansion of a fluorochemical cluster.

The research activities under the Chair are not limited to fluorochemicals but also cover the areas of chemical thermodynamics and separation technology. Thus, the Research Unit has one of the best equipped laboratories in the Southern Hemisphere and is one of the largest groups working in this field.

Ramjugernath is passionate about human capacity development and is a strong believer in a collaborative approach to research capacity development. In this regard he has had a number of research bi-lateral agreements for the exchange and training of students and researchers with research groups based in countries such as Germany, the United States of America, Canada, Sweden, the United Kingdom, Poland, France, and the Czech Republic.

“Professor Ramjugernath is passionate about human capacity development and is a strong believer in a collaborative approach to research capacity development.”



QUANTUM INFORMATION PROCESSING AND COMMUNICATION

Professor Francesco Petruccione
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Francesco Petruccione, Professor of Theoretical Physics at the University of KwaZulu-Natal, was awarded an Innovation Fund grant in 2005 to set up a Centre for Quantum Technology and in 2007 was granted the South African Research Chair for Quantum Information Processing and Communication.

Petruccione has been working on the theory of open quantum systems, which is at the basis of many recent quantum technological applications. The miniaturisation of technological devices necessitates manipulation of objects at the nanoscale level at which coherent quantum mechanical processes start to dominate the physical properties.

The unavoidable interaction of these systems with their environment gives rise to dissipative mechanisms and a strong loss of quantum coherence, i.e. decoherence. Since perfect isolation of quantum systems is not possible, it is of central importance to incorporate the methods and tools of the theory of quantum systems in the exploration of quantum technologies. Among the basic tools of the new quantum technologies are quantum metrology, quantum control, quantum, communication and quantum computation.

In 2011 the Research Chair started to apply the theoretical methods of open quantum systems and quantum information processing to quantum biology. As the name suggests,

quantum biology is the application of quantum mechanics to aspects of the biological sciences.

Recently, developments in experimental spectroscopy have for the first time revealed quantum effects in biological systems, including in the photosynthetic light-harvesting complexes of certain bacteria and marine algae. The energy transfer in photosynthetic complexes is achieved with an efficiency of 95%.

To understand how living systems, which are highly complex, warm and in constant interaction with the environment, can sustain and exploit quantum coherence, has huge implications for quantum engineering of technological devices.

Members of the Group, together with Professor A Ekert of the University of Oxford and the National University of Singapore, have suggested a mechanism that can help explain some of the experimental observations [I. Sinayskiy, A. Marais, F. Petruccione, A. Ekert, Phys. Rev. Lett. 108, 020602 (2012)].

The Research Chair has been renewed for a further five years.



“To understand how living systems, which are highly complex, warm and in constant interaction with the environment, can sustain and exploit quantum coherence, has huge implications for quantum engineering of technological devices.”

GRAVITATING SYSTEMS

Professor Sunil Maharaj
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Professor Sunil Maharaj is the holder of the prestigious South African Research Chair in Gravitating Systems. He was made a Fellow of UKZN in 2009 for his research contributions.

Maharaj, who is the Director of the Astrophysics and Cosmology Research Unit in the School of Mathematical Sciences, focuses his primary research on the modelling of astrophysical processes in relativistic stars and the mathematics of large scale dynamics in cosmology.

His contribution, in collaboration with many MSc and PhD students, to science and technology is manifested in his work on gravitational forces within the context provided by Einstein's theory of general relativity. These works include: exact solutions of the Einstein Field equations, the structure of ultra compact stars and the thermodynamics of radiating matter.

Homogeneous cosmological models are important in describing realistic processes such as the formation of voids and particle creation in the universe. With colleague, Professor Kesh Govinder, and a doctoral student, Mr Mandla Kweyama, Maharaj has been analysing the dynamics of these processes. Together they have found several new solutions to the Einstein equations in this context by using a variety of advanced mathematical techniques including Lie point and contact transformations.

In particular, they studied the evolution of shear-free

spherically symmetric charged fluids in strong gravitational fields. This required the detailed analysis of the coupled Einstein-Maxwell system of equations, which couple gravity and charge in a nonlinear way. Few models to this long-standing and difficult problem are known. By using advanced group theoretical techniques involving Noether and Lie conserved quantities, they generated new classes of charged gravitational models which are the most general known.

This is a significant achievement as it completes an initiative that arose in the pioneering work of Kustaanheimo and Qvist in the 1950s. The results have been published in the international journal *Classical and Quantum Gravity*.

These new models will help to obtain a deeper insight into the behaviour of gravity in the presence of charge.

“Professor Maharaj's contribution, in collaboration with many MSc and PhD students, to science and technology is manifested in his work on gravitational forces within the context provided by Einstein's theory of general relativity. ”



SYSTEMS BIOLOGY OF HIV AND AIDS

Professor Thumbi Ndung'u
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Professor Thumbi Ndung'u holds the position of Associate Professor in HIV/AIDS Research at UKZN and is Director of the HIV Pathogenesis Programme (HPP), a collaborative initiative between the University, Harvard Medical School and the University of Oxford in England.

HPP is dedicated to understanding host-pathogens interactions in HIV and tuberculosis infections, particularly immune responses and to the training of globally competitive African scientists.

Ndung'u, his team and their collaborators are currently studying how certain individuals are able to resist HIV-1 infection despite evidence of persistent exposure and how certain HIV-1 infected people are able to achieve relative control of HIV-1 replication. The knowledge gained from studies of people able to resist or control HIV-1 may eventually be used to develop novel vaccines or therapies against HIV and AIDS.

He and his team have recently shown that during the early phases of HIV-1 infection, before full seroconversion has been achieved, the body is unable to mount detectable cellular immune responses to some viral epitopes despite the presence of wild-type virus sequences that should induce such an immune response, based on patterns of responses seen in chronically infected persons.

They also demonstrated that genetic polymorphisms in the immunoregulatory cytokine interleukin 10 (IL-10) may affect the quality of immune responses, providing mechanistic evidence of earlier observations that IL-10 genetic variation can influence HIV infection outcome.

Further, they have explored the consequences of immune-driven sequence variation for the virus and clinical disease outcome. Using a population of over 400 chronically infected people, they showed that recombinant viruses constructed using patient-derived Gag-protease proteins

can differ widely in their replicative fitness. Viral fitness varied significantly across different immune genes called HLA-B class I alleles and viral fitness differences correlated with disease outcome. These studies have shed new light on how a vaccine may be designed to attenuate the virus.

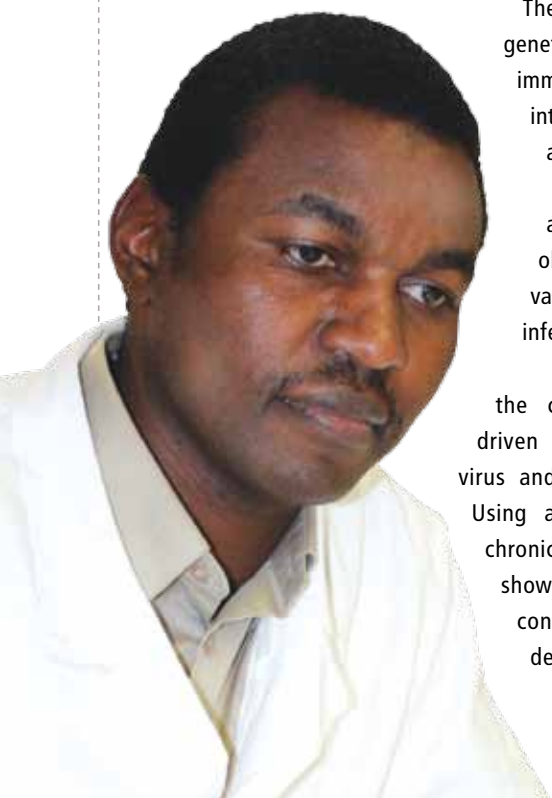
In other studies, they have described emerging patterns of drug resistance among children and adults in KwaZulu-Natal.

A graduate of the University of Nairobi and Harvard University, Ndung'u is a molecular virologist by training based at the Doris Duke Medical Research Institute at UKZN's Nelson R Mandela School of Medicine. In 2007 he was awarded the prestigious Vice-Chancellor's award for exceptional research and research-related scholarly activities. He was previously awarded the Edgar Haber Award (Harvard University) for outstanding doctoral thesis research.

Ndung'u's previous significant accomplishments include the development of the first full-length infectious clone of HIV-1C from Africa, an important reagent for detailed genetic studies of this strain. This genetic tool allows for various studies on drug sensitivity and vaccine design to be conducted. He is also credited with the generation of the subtype C simian human immunodeficiency virus (SHIV), a genetic chimera between HIV and SIV vaccine tests.

Ndung'u's main research interests are in the host-virus interactions underlying HIV and AIDS pathogenesis and antiviral immune responses. He is also interested in the development of biomedical interventions that can be used in resource-limited settings to stop the spread of HIV and AIDS.

He has a special interest in the training and development of young scientists.



“ Professor Ndung'u's main research interests are in the host-virus interactions underlying HIV and AIDS pathogenesis and antiviral immune responses. ”

APPLIED POVERTY REDUCTION IMPACT ASSESSMENT

Professor Julian D May
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Professor Julian May is the NRF-funded South African Research Chair in Applied Poverty Reduction Assessment to which he was appointed in 2009.

The aims of the Chair are in three interrelated areas of applied poverty reduction assessment: the ongoing improvement of the indicators that are used to reflect change; the analysis of the impact of poverty reducing interventions; and investigating wider dynamics that offset or contribute towards desired policy goals.

During 2011, assistance was provided to Statistics South Africa (Stats SA) in the development, implementation and analysis of a new national data series, the Living Conditions Survey (LCS) that was undertaken in 2009. This survey collects information on a wide range of poverty indicators including anthropometric status of children, subjective measures of poverty as well as conventional money metric measures.

As a part of this activity, the SDS hosted a six-month visit by Dr Louis Manyukazi, the former Statistician-General of Rwanda. With the support of the African Development Bank and International Comparisons Project (ICP) based in Washington DC, a new instrument is being developed for the collection of data on the impact of the construction sector on poverty reduction. At the present most international data exclude the construction of informal and traditional housing. Specialist quantity surveyors will be involved in this project, which will have global significance for the calculation and comparison of Gross Domestic Product and poverty indicators if accepted.

May is the first person in a developing country to be appointed to the Technical Advisory Group of the ICP, which guides the collection of data for the calculation of Purchasing Power Parity (PPP) used to standardise the measurement of gross domestic product and poverty indicators.

Working with four telecentres in poor communities in

KwaZulu-Natal, Community-based Learning, ICT and Quality-of-life (CLIQ) trained 100 participants in the use of computers and the internet. The impact of this training and their use of ICT have been monitored using participatory research methods.

In Uganda, Tanzania, Rwanda and Kenya a project using panel data from 1 600 households interviewed in 2008 and again in 2010 has developed new methods of depicting multi-dimensional poverty and has estimated the causal association between ICT access and poverty reduction. This was presented to the international ICT4D2010 conference held in London in 2010.

The third assessment is an impact assessment of the KwaZulu-Natal Gijima programme for Local Economic Development (LED), which involves targeted grants to promote poverty reduction through enterprise. A multi-disciplinary team of economists, planners and impact specialists is working on this project.

Finally, using a competitive grant awarded by the European Union (EU) via the Programme to Support Pro-Poor Policy Development (PSPPD), a collaborative project with the London School of Hygiene and Tropical Medicine and the University of Cape Town is examining factors influencing inequities in child outcomes.



“Professor May is the first person in a developing country to be appointed to the Technical Advisory Group of the International Comparisons Project based in Washington DC.”

INDIGENOUS HEALTH CARE SYSTEMS

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The prime focus of Professor Nceba Gqaleni, Research Chair in Indigenous Health Care Systems Research, is to provide a platform for research and development in the field of traditional medicine, providing an essential academic link between national policy and implementation.

The Chair contributes to developing scientifically proven African traditional medicines and also to the institutionalisation of the African traditional health care system. Various projects currently exist and include the United States government-funded Biomedical and Traditional Healing Collaboration on HIV/AIDS, the NIH/NCCAM-funded traditional medicine clinical trial at Edendale Hospital in Pietermaritzburg; and the Department of Science and Technology IKS Bioprospecting Programme.

This platform promotes bidirectional referrals between Traditional Health Practitioners (THPs) and public health centres, documents ethnomedical evidence, bioprospecting and other mechanisms to evaluate plant-based and herbal mixtures for biological activity with therapeutic efficacy in the areas of cancer, TB, and HIV/AIDS. It also conducts clinical

trials and equips THPs to conduct their own clinical research on traditional medicine. Above all, the indigenous health care systems research enhances scientific knowledge on traditional medicine and attracts young scientists to this field.

Gqaleni obtained his PhD in Bioscience and Biotechnology from the University of Strathclyde in Scotland. He is a former Deputy Dean at the Nelson R Mandela School of Medicine and was also Operations Director at the Doris Duke Medical Research Institute.

Gqaleni is a member of the International Association of Physicians in AIDS Care, Chair of the IKS Bioprospecting and Product Development Platform of the Department of Science and Technology and has served on the Presidential Task Team on Traditional Medicines and the World Health Organisation (African region) Expert Committee on Traditional Medicines.



“ This platform promotes bidirectional referrals between THPs and public health centres, documents ethnomedical evidence, bioprospecting and other mechanisms to evaluate plant-based and herbal mixtures for biological activity with therapeutic efficacy in the areas of cancer, TB, and HIV/AIDS. ”

LAND USE PLANNING AND MANAGEMENT

Land Use Planning and Management falls under the Water, Environment and Biodiversity Research Focus Area.

The work of the Chair will directly address the following prioritised outcomes in order of contribution:

- Protection and enhancement of environmental assets and natural resources
- Vibrant, equitable, sustainable rural communities and food security for all
- Sustainable human settlements and improved quality of households

The Chair fits into the land use planning, land management and sustainable development strategic thrust which is a key area for drawing the Life Sciences disciplines together in a new way that will unlock a stepchange in research and human capital development capacity.

The Chair also forms a hub for interaction across private and public research institutions. Synergy between government, councils, industry and UKZN will be enhanced through improving productivity as well as making the research knowledge base applicable to conservation and economic development.

Envisaged outcomes of the work of the Chair include:

- An understanding of the factors influencing resilience of natural systems, particularly the savanna, grassland, forest, thicket mosaic of eastern and northern South Africa. This will be in the context of different land-use options, including natural systems, agricultural systems, and urbanising systems, all of which occur adjacent to each other, creating an integrated matrix. The focus will be on the savanna and grassland habitats; on sugarcane and forestry, and large-scale commercial agriculture in eastern South Africa; and for the urban context, especially in the eThekweni Municipal Region
- An understanding of threats to resilience of systems and to the ecosystem services they offer, and how to monitor and assess these on an ongoing basis
- A local/regional model of conservation planning in the context of hyper-biodiversity and biome mosaics at the local scale
- An environmental management plan for eThekweni Municipality that incorporates ecosystem services and natural system resilience into a sustainable development plan incorporating trajectories of global (climate) change
- A decision-making system for sustainable economic development within eThekweni Municipality, which is transferable and scalable to other systems, and incorporates the value of, and risks to, natural systems
- A planning framework for commercial agricultural development (sugarcane and forestry, including potential bioenergy production), consumptive and non-consumptive use of natural systems, and small-scale community farming using a matrix approach
- Development of human capital and institutional capacity across a range of education, research and advisory bodies, which are mandated with responsibilities incorporated within the domain of this work. This includes development of staff, and training of a large number of postgraduate students through the programme.

“The Chair fits into the land use planning, land management and sustainable development strategic thrust which is a key area for drawing the Life Sciences disciplines together in a new way that will unlock a stepchange in research and human capital development capacity.”

INTELLIGENT REAL TIME POWER SYSTEMS

Intelligent Real Time Power Systems (IRTPS) falls under the Energy and Technology for Sustainable Research Focus Area.

The Chair, with its focus on energy security, is well aligned with UKZN's energy and technology for sustainable development research thrust.

IRTPS considers the utilisation of computational intelligence techniques for use on power systems in a smart grid utilising wireless networked systems for monitoring and control. The Chair will consider utilisation of intelligence embedded in the grid to perform dynamic optimisation of power grid resources to ensure grid stability and energy efficiency, among other issues.

IRTPS is essential for the control and intelligence (and learning) needed for the electricity grid to become 'smart'.

South Africa is facing considerable challenges in terms of energy and there are significant market opportunities which can be exploited by developing a core capability in IRTPS and a linked capability in advanced sensor networks (ASN). Examples include: smart grid and the green economy.

Solutions in this area will require multi-disciplinary research and development. IRTPS is a critical field since it focuses the disciplines of computational intelligence, pattern recognition, power systems, and wireless communications to operate within resource constrained environments which are very sensitive to computational and energy requirements needed for security, communications and co-operative processing. IRTPS is therefore a priority area to build significant competence and excellence.

South African capability to respond to smart grid opportunities is currently fragmented and sub-critical (not only for IRTPS, but also for the linked ASN environment). The IRTPS Research Chair is thus part of a significant government intervention to stimulate use and development of indigenous applications. The IRTPS Research Chair is one part of the strategy to coordinate the fragmented national capability and build critical mass in IRTPS.

This will be complemented with a significant Eskom partnership in the smart grid niche area for research and development and product development along with schemes to leverage government procurement power to build local industrial and service capability.

The intention with this IRTPS Research Chair is to build up core R&D capability in IRTPS at UKZN and link this to sensor networks research at the University of Pretoria and the CSIR and other capacity programmes nationally to create critical R&D mass with the ability to solve hard R&D challenges and develop products for niche areas through joint product development with industry.



RURAL AGRONOMY AND DEVELOPMENT

The Research Chair in Rural Agronomy and Development – in the Energy and Technology for Sustainable Development Research Focus Area – enjoys high priority in terms of the strategic planning of the College of Agriculture, Engineering and Science.

Its focus and thematic areas are aligned with the key strategic areas and thrusts of the SA National Agriculture and Development Strategy (DoA 2008), particularly human capital development; innovation and transfer of technology; and collaboration and partnerships.

The work of the Chair will involve contributing to community development through research, agricultural innovation and agricultural extension. The work will be done in partnership with public institutions and other agriculture-supporting bodies. It is aligned with the Government's priorities of employment creation,

food security, support for smallholder farmers and sustainable livelihoods, rural wealth creation and skills development.

The Chair will contribute to the development of new technology to support smallholder farmers in agriculture, and the agricultural industry in general. It will also contribute towards human capital development through training of postgraduate students at MSc and PhD levels.

The Chair will have strong links with the existing centres of excellence such as the African Centre for Crop Improvement (ACCI) and African Centre for Food Security (ACFS) at UKZN.



NRF-RATED RESEARCHERS

National Research Foundation (NRF) A-rated researchers are defined as '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'.

PROFESSOR PATRICIA BERJAK

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Professor Patricia Berjak, an A-rated scientist is recognised internationally for her pioneering fundamental studies on seed recalcitrance which followed on from her work characterising deterioration in orthodox seeds. Those earlier achievements are exemplified by five papers from her doctorate thesis being published in international literature, the findings of which contributed a major chapter, demonstrating the importance of membrane deterioration in viability loss in the definitive book *Seed Viability* by EH Roberts.

Berjak rapidly attained a position of international eminence for her fundamental studies on recalcitrant seeds and their conservation. She has also demonstrated the importance of seed-borne fungi in the loss of storage viability.

Since 1978 Berjak has supervised to graduation 42 MSc students and 18 PhD students, many of whom have gone on to establish successful scientific careers of their own, both in South Africa and abroad.

Berjak teaches seed biology at the senior undergraduate level and is a leader of two Honours modules focusing on desiccation-sensitivity and desiccation tolerance, and cryobiology. She also consistently inducts interns at senior undergraduate level into research as leader of a large group of postgraduates.

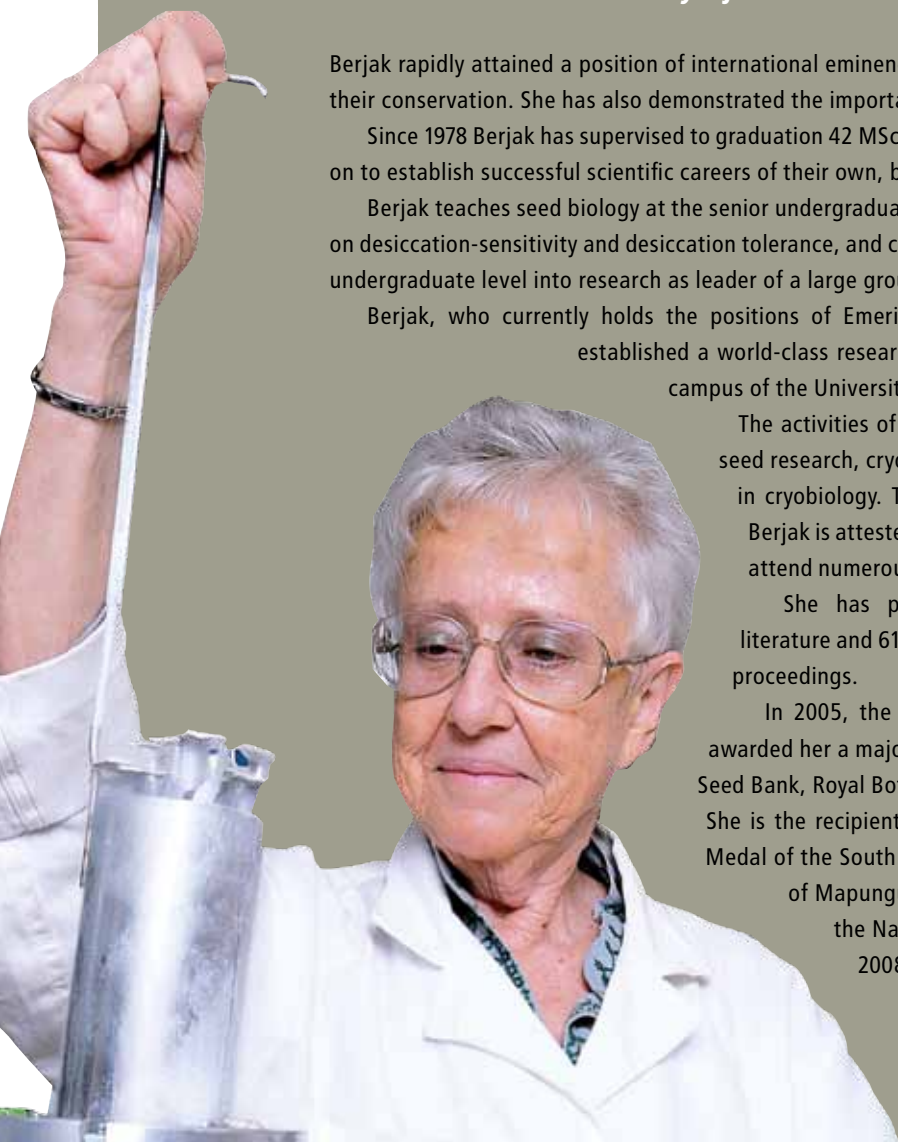
Berjak, who currently holds the positions of Emeritus Professorship and Senior Research Associate, has established a world-class research group in the School of Life Sciences on the Westville campus of the University of KwaZulu-Natal.

The activities of her group include fundamental and applied recalcitrant seed research, cryostorage and the provision of postgraduate level training in cryobiology. The high esteem in which international colleagues hold Berjak is attested by her invitations to work in laboratories abroad and to attend numerous international conferences as a keynote or lead speaker.

She has published 173 peer-reviewed papers in international literature and 61 book chapters and full-length peer-reviewed conference proceedings.

In 2005, the Darwin Initiative of the United Kingdom Government, awarded her a major competitive grant in collaboration with the Millennium Seed Bank, Royal Botanic Gardens, Kew, in England.

She is the recipient of a number of prestigious awards including the Gold Medal of the South African Association of Botanists and the National Order of Mapungubwe (Silver) from the President of South Africa in 2006, the National Research Foundation's Lifetime Achiever Award in 2008, and the eThekweni Living Legend Award in 2010.



PROFESSOR MICHAEL CHAPMAN

chapman@ukzn.ac.za

Professor Michael Chapman – Emeritus Professor and Fellow at UKZN and Fellow at the Stellenbosch Institute for Advanced Study – is an A-rated researcher who is recognised by his peers as a world leader in the field of southern African and postcolonial literature.

Chapman has produced major works on, among others, the poets Roy Campbell and Douglas Livingstone, the new black poets of the 1970s, and the *Drum* short-story writers of the 1950s. His study, *South African English Poetry: A Modern Perspective* (1984) won the Sanlam Award for literary criticism.

His literary history, *Southern African Literatures* (1996; 2003), received both the University of Natal Book Prize and the prestigious Bill Venter Prize for academic writing. His collection of essays, *Art Talk, Politics Talk* (2006), was the winner of the 2006/2007 University of KwaZulu-Natal Book Prize.

Chapman edited the collection of essays, *Postcolonialism: South/African Perspectives* (2008) and, together with colleague Emeritus Professor Margaret Lenta, compiled a major collection of essays by 15 leading academics, entitled *SA Lit: Beyond 2000* (2011).

He is the Editor-in-Chief of the accredited journal, *Current Writing*, and has been awarded an NRF 'blue skies' grant to research the uses of literature in contemporary South African society.

The project investigates how literature in South Africa might play a role in human and societal flourishing. Literature is defined not narrowly as high art, but broadly as imaginative expression and responsiveness. Despite the local focus the project has global applicability.

Whether in South Africa or abroad, it is difficult to make a compelling case for the study of literature. Arguments against literary value are usually based on questions of pragmatism and vocationalism.

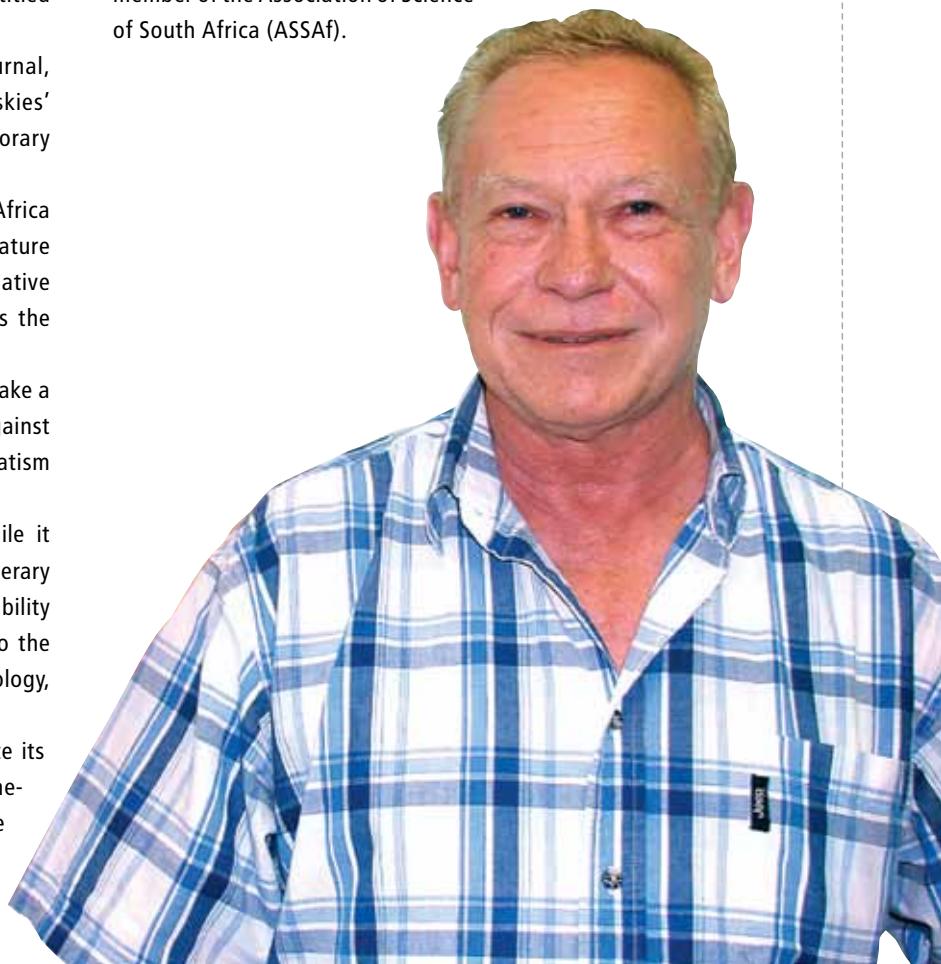
The project takes account of such arguments while it makes a case for the value of literature not only in literary studies – literary studies has reneged on its responsibility to the text as its primary object of study – but also to the teaching/training of disciplines such as sociology, psychology, law, and medicine.

In the academic sphere, the project will disseminate its findings in the *Current Writing* and/or in chapters-in-the-book. In seeking a wider audience the findings will be

reworked as shorter pieces aimed at commentary sections in newspapers.

Here, the project sees itself intervening in a 'post-apartheid' difficulty of a divisive public language. Lastly, findings will be formulated as recommendations to the professions for modifications to the education and training of graduates: modifications that might grant greater value than at present to the uses of literature in society.

A member of the advisory board of the Ferguson Centre for African and Asian Studies (Open University, United Kingdom), and the intercultural committee of the International Comparative Literature Association, Chapman was awarded the Gold Medal of the English Association of southern Africa in recognition of his services to English education and is a member of the Association of Science of South Africa (ASSAf).



PROFESSOR ROB GOUS

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Professor Rob Gous of the School of Agricultural Sciences and Agribusiness, an A-rated researcher, continues to contribute to knowledge in the field of poultry science at UKZN.

His research over the past 22 years has involved the development of simulation models that predict food intake and growth of broilers and pigs. Apart from providing answers to 'what-if' scenarios, these simulation models optimise the way in which broilers and pigs should be fed to maximise any one of a number of objective functions, such as margin per square metre per annum, breast meat yield or feed conversion efficiency.

Currently, he is conducting research that will lead to more accurate prediction of food intake and reproductive activity in broiler breeders and laying hens. Being one of very few simulation modellers in poultry science, he has been invited to venues all over the world to present these models to poultry scientists and producers who use these models.

Together with the late Dr Peter Lewis, a researcher from the United Kingdom, Gous published extensively on the research they conducted at UKZN over a period of 10 years on the lighting of broiler breeders. The lighting management of

these birds was previously based on what is appropriate for commercial laying pullets, and their research proved that such practices are inappropriate for broiler breeders, resulting in a paradigm shift in the way these birds are managed throughout the world.

He has been a member of the world branch of the World's Poultry Science Association for eight years, and is currently the senior Vice-President.

As part of his engagement with community, Gous is a founder member of the KwaZulu-Natal Poultry Institute, whose purpose is to train prospective poultry managers by providing them with the skills needed to manage people, finances, poultry operations and even themselves.

The Poultry Institute has impressive training facilities, including accommodation, lecture rooms, computers and a wide range of ongoing poultry operations, and these are housed on the University's research and training farm, Ukulinga.

This Institute has been, and continues to be, highly successful in training students and preparing them for life.

Gous is now part of a team applying the same principles at Baynesfield for training prospective pig producers.

“ Professor Gous has been a member of the world branch of the World’s Poultry Science Association for eight years, and is currently the senior Vice-President. ”



PROFESSOR STEVE JOHNSON

johnsonsd@ukzn.ac.za

A-rated researcher Professor Steve Johnson holds the South African Research Chair in Evolutionary Biology and is a Professor in the School of Biological and Conservation Sciences on UKZN's Pietermaritzburg campus.

Steve Johnson's PhD on the pollination of plants in the Cape flora was obtained from the University of Cape Town in 1994 and he has since become a leading specialist in the field of plant pollination biology.

Johnson's research is aimed at understanding the evolutionary diversification of plants, particularly in southern Africa, the conservation of plant-pollinator mutualisms, and the reproductive biology of invasive species. He has recently developed a strong interest in the role of floral volatiles in mediating specialised plant-pollinator interactions, and has established a state-of-the-art laboratory for the study of chemical cues used by plants to attract insect pollinators.

He has published more than 200 peer-reviewed scientific papers, co-authored a book on the *Natural History of Table Mountain* and has also written many popular science articles.

He is currently on the editorial boards of two

international journals, *Oecologia* and *Arthropod-Plant Interactions*, and was guest editor for a special issue of the *South African Journal of Botany* in 2009. He received the NRF President's Award in 1999 and currently holds an A2-rating from the NRF.

“Professor Johnson's research is aimed at understanding the evolutionary diversification of plants, particularly in southern Africa, the conservation of plant-pollinator mutualisms, and the reproductive biology of invasive species.”



NRF-RATED RESEARCHERS IN 2011

College of Agriculture, Engineering and Science			
Title	Surname	Initials	School/Research Centre
Professor	Bob	U	Agricultural, Earth and Environmental Sciences
Professor	Chimonyo	M	Agricultural, Earth and Environmental Sciences
Dr	Ciacchiariello	M	Agricultural, Earth and Environmental Sciences
Professor	Gous	RM	Agricultural, Earth and Environmental Sciences
Professor	Green	JM	Agricultural, Earth and Environmental Sciences
Professor	Hill	T	Agricultural, Earth and Environmental Sciences
Professor	Hughes	JC	Agricultural, Earth and Environmental Sciences
Professor	Jewitt	GPW	Agricultural, Earth and Environmental Sciences
Professor	Maharaj	B	Agricultural, Earth and Environmental Sciences
Professor	Maharaj	SD	Agricultural, Earth and Environmental Sciences
Professor	McCourt	S	Agricultural, Earth and Environmental Sciences
Professor	Modi	AT	Agricultural, Earth and Environmental Sciences
Professor	Mutanga	O	Agricultural, Earth and Environmental Sciences
Professor	Nsahlai	IV	Agricultural, Earth and Environmental Sciences
Professor	Ortmann	GF	Agricultural, Earth and Environmental Sciences
Dr	Ovechkina	MN	Agricultural, Earth and Environmental Sciences
Dr	Proches	S	Agricultural, Earth and Environmental Sciences
Professor	Savage	MJ	Agricultural, Earth and Environmental Sciences
Professor	Scott	DM	Agricultural, Earth and Environmental Sciences
Dr	Uken	R	Agricultural, Earth and Environmental Sciences
Professor	Andersson	PG	Chemistry and Physics
Dr	Bala	MD	Chemistry and Physics
Professor	Bharuth-Ram	K	Chemistry and Physics
Dr	Coombes	PH	Chemistry and Physics
Professor	De Lange	OL	Chemistry and Physics
Professor	Ford	TA	Chemistry and Physics
Professor	Friedrich	HB	Chemistry and Physics
Professor	Hellberg	MA	Chemistry and Physics
Professor	Hey	JD	Chemistry and Physics
Professor	Hughes	ARW	Chemistry and Physics
Professor	Jaganyi	D	Chemistry and Physics
Professor	Jonnalagadda	SB	Chemistry and Physics
Professor	Konrad	T	Chemistry and Physics
Professor	Kruger	HG	Chemistry and Physics
Professor	Mace	RL	Chemistry and Physics
Professor	McKenzie	JF	Chemistry and Physics
Dr	Moodley	M	Chemistry and Physics
Dr	Moyo	T	Chemistry and Physics
Professor	Munro	OQ	Chemistry and Physics

College of Agriculture, Engineering and Science			
Title	Surname	Initials	School/Research Centre
Dr	Ngila	JC	Chemistry and Physics
Dr	Nyamori	VO	Chemistry and Physics
Professor	Pellicane	GP	Chemistry and Physics
Professor	Petruccione	F	Chemistry and Physics
Professor	Robinson	RS	Chemistry and Physics
Dr	Sergi	A	Chemistry and Physics
Professor	van Heerden	FR	Chemistry and Physics
Professor	Walker	ADM	Chemistry and Physics
Professor	Adali	S	Engineering
Professor	Bezuidenhout	CN	Engineering
Professor	Boje	ES	Engineering
Professor	Bright	G	Engineering
Professor	Carsky	M	Engineering
Professor	Meikap	BC	Engineering
Dr	Mwithiga	G	Engineering
Professor	Pegram	GGs	Engineering
Professor	Ramjugernath	D	Engineering
Professor	Smithers	JC	Engineering
Professor	Trois	C	Engineering
Professor	Workneh	T	Engineering
Professor	Ariatti	M	Life Sciences
Professor	Beckett	RP	Life Sciences
Professor	Berjak	P	Life Sciences
Dr	Brown	M	Life Sciences
Dr	Bytebier	BLG	Life Sciences
Dr	Chenia	H	Life Sciences
Dr	Derera	J	Life Sciences
Professor	Downs	CT	Life Sciences
Dr	Erwin	DJ	Life Sciences
Dr	Glassom	D	Life Sciences
Professor	Goldring	JPD	Life Sciences
Dr	Griffiths	ME	Life Sciences
Dr	Gueguim Kana	GKEB	Life Sciences
Professor	Hart	RC	Life Sciences
Dr	Islam	MS	Life Sciences
Professor	Johnson	SD	Life Sciences
Dr	Juergens	A	Life Sciences
Professor	Lin	J	Life Sciences
Professor	Lovegrove	BG	Life Sciences
Professor	Mukaratirwa	S	Life Sciences
Professor	Naidoo	G	Life Sciences
Dr	Niesler	CU	Life Sciences
Dr	Olaniran	AO	Life Sciences
Professor	Pammenter	NW	Life Sciences

NRF-RATED RESEARCHERS – 2011

College of Agriculture, Engineering and Science			
Title	Surname	Initials	School/Research Centre
Professor	Perissinotto	R	Life Sciences
Professor	Perrin	MR	Life Sciences
Professor	Pillay	B	Life Sciences
Dr	Scharler	UM	Life Sciences
Professor	Schmidt	S	Life Sciences
Dr	Shrader	AM	Life Sciences
Dr	Singh	M	Life Sciences
Dr	Singh	N	Life Sciences
Professor	Slotow	RH	Life Sciences
Dr	Smit	AJ	Life Sciences
Dr	Stirk	WA	Life Sciences
Professor	Thandar	AS	Life Sciences
Professor	van Staden	J	Life Sciences
Professor	Ward	DM	Life Sciences
Professor	Watt	MP	Life Sciences
Professor	Baboolal	D	Mathematics, Statistics and Computer Science
Professor	Banasiak	J	Mathematics, Statistics and Computer Science
Professor	Dankelmann	PA	Mathematics, Statistics and Computer Science
Dr	Ghosh	PP	Mathematics, Statistics and Computer Science
Professor	Govinder	KS	Mathematics, Statistics and Computer Science
Professor	Gutsev	VG	Mathematics, Statistics and Computer Science
Professor	Leach	PGL	Mathematics, Statistics and Computer Science
Professor	Moodley	K	Mathematics, Statistics and Computer Science
Dr	Mukwembi	S	Mathematics, Statistics and Computer Science
Professor	Raftery	JG	Mathematics, Statistics and Computer Science
Professor	Ray	S	Mathematics, Statistics and Computer Science
Professor	Rodrigues	BG	Mathematics, Statistics and Computer Science
Professor	Sibanda	P	Mathematics, Statistics and Computer Science
Professor	van den Berg	JE	Mathematics, Statistics and Computer Science
Professor	Xu	H	Mathematics, Statistics and Computer Science
College of Health Sciences			
Title	Surname	Initials	School/Research Centre
Professor	Newell	ML	Africa Centre
Professor	Bhimma	R	Clinical Medicine
Dr	Burns	JK	Clinical Medicine
Professor	Coutsoudis	A	Clinical Medicine
Dr	Mosam	A	Clinical Medicine
Professor	Naidoo	DP	Clinical Medicine
Professor	Essack	SY	Health Sciences
Professor	Govender	T	Health Sciences
Dr	Govender	T	Health Sciences
Professor	Gqaleni	N	Health Sciences
Professor	McKune	AJ	Health Sciences
Professor	Moodley	J	Health Sciences
Professor	Naicker	T	Health Sciences

College of Health Sciences			
Title	Surname	Initials	School/Research Centre
Professor	Naidoo	N	Health Sciences
Professor	Oduntan	OA	Health Sciences
Professor	Satyapal	KS	Health Sciences
Professor	Suleman	F	Health Sciences
Professor	Daniels	WMU	Laboratory Medicine and Medical Sciences
Professor	Mackraj	IV	Laboratory Medicine and Medical Sciences
Professor	Musabayane	CT	Laboratory Medicine and Medical Sciences
Professor	Ndung'u	PT	Laboratory Medicine and Medical Sciences
Dr	Pillay	M	Laboratory Medicine and Medical Sciences
Professor	Pillay	TS	Laboratory Medicine and Medical Sciences
Dr	Bland	RM	Nursing and Public Health
Dr	Brysiewicz	P	Nursing and Public Health
Dr	Kvalsvig	JD	Nursing and Public Health
Dr	Naidoo	S	Nursing and Public Health
Dr	Ncama	BP	Nursing and Public Health
Professor	Taylor	M	Nursing and Public Health
Professor	Uys	LR	Nursing and Public Health
College of Humanities			
Title	Surname	Initials	School/Research Centre
Professor	Collings	SJ	Applied Human Sciences
Professor	Durrheim	K	Applied Human Sciences
Professor	Henzi	SP	Applied Human Sciences
Professor	McCracken	DP	Applied Human Sciences
Professor	Potgieter	CA	Applied Human Sciences
Professor	Armstrong	JY	Arts
Professor	Ballantine	CJ	Arts
Professor	Calder	IMS	Arts
Professor	Chapman	MJF	Arts
Professor	Coullie	JE	Arts
Professor	De Meyer	BAMS	Arts
Professor	Dimitriu	I	Arts
Professor	Green	MM	Arts
Professor	Leeb-Du Toit	JC	Arts
Professor	Stiebel	EA	Arts
Professor	Stobie	C	Arts
Professor	Teer-Tomaselli	RE	Arts
Professor	Tomaselli	KG	Arts
Professor	Turner	NS	Arts
Dr	Wessels	MA	Arts
Professor	Wildsmith-Cromarty	R	Arts
Dr	Ballard	RJ	Built Environment and Development Studies
Professor	Bond	P	Built Environment and Development Studies
Professor	Maharaj	P	Built Environment and Development Studies
Professor	Marks	M	Built Environment and Development Studies
Professor	May	JD	Built Environment and Development Studies

NRF-RATED RESEARCHERS – 2011

College of Humanities			
Title	Surname	Initials	School/Research Centre
Professor	Posel	D	Built Environment and Development Studies
Professor	Valodia	IAK	Built Environment and Development Studies
Professor	Mare	PG	Centre for Critical Research on Race and Identity
Professor	Bhana	D	Education
Professor	Buthelezi	MT	Education
Professor	de Villiers	MD	Education
Dr	Deacon	RA	Education
Dr	Grant	C	Education
Professor	Koopman	A	Education
Dr	Maistry	SM	Education
Dr	Mncube	VS	Education
Professor	Moletsane	R	Education
Professor	Muthukrishna	A	Education
Professor	Ramrathan	P	Education
Professor	Collier	JD	Religion, Philosophy and Classics
Professor	Denis	PMBR	Religion, Philosophy and Classics
Professor	Draper	JA	Religion, Philosophy and Classics
Professor	Ebrahim	AFM	Religion, Philosophy and Classics
Dr	Efthimiadis-Keith	H	Religion, Philosophy and Classics
Professor	Hilton	JL	Religion, Philosophy and Classics
Professor	Lenta	PJP	Religion, Philosophy and Classics
Dr	Murove	M	Religion, Philosophy and Classics
Professor	Nadar	S	Religion, Philosophy and Classics
Professor	Penumala	PK	Religion, Philosophy and Classics
Professor	Phiri	IA	Religion, Philosophy and Classics
Professor	Spurrett	DJ	Religion, Philosophy and Classics
Professor	West	GO	Religion, Philosophy and Classics
Professor	Ayee	JRA	Social Sciences
Professor	Khan	S	Social Sciences
Professor	Marschall	S	Social Sciences
Professor	Pattman	RW	Social Sciences
Professor	Singh	SB	Social Sciences
Professor	Sooryamoorthy	R	Social Sciences
Professor	Stilwell	C	Social Sciences
Professor	Vahed	GH	Social Sciences
College of Law and Management Studies			
Title	Surname	Initials	School/Research Centre
Professor	Harris	GT	Accounting, Economics and Finance
Professor	Stainbank	LJ	Accounting, Economics and Finance
Professor	Whiteside	AW	HEARD
Professor	Kidd	MA	Law
Professor	McQuoid-Mason	DJ	Law
Professor	Mubangizi	JC	Law
Professor	Singh	JA	Law
Professor	Reddy	PS	Management, Information Technology and Governance
Dr	Ruggunan	SD	Management, Information Technology and Governance

FELLOW OF THE UNIVERSITY

PROFESSOR UMESH LALLOO

lalloo@ukzn.ac.za

Acknowledged as a UKZN Fellow in 2011 for distinguished academic achievement, Professor Umesh Lalloo is the Dean of the Nelson R Mandela School of Medicine.

Lalloo is also the Head of the Department of Respiratory Medicine, Director of Adult HIV Programmes and Executive Director of the KwaZulu-Natal Enhancing Care Initiative.

Committed to research and training in HIV, TB pulmonology and critical care, he was a member of the team which reported on the first cases of the XDR-TB outbreak in South Africa.

Over the past 10 years, he has attracted more than R290 million in grants and contracts, including a recent US\$10 million grant from the National Institutes of Health (NIH) for the Medical Education Partnership Initiative (MEPI).

Lalloo has published extensively in the areas of TB, HIV and critical care, authoring 13 non peer-reviewed and 70 peer-reviewed articles, five book chapters and numerous local and international conference publications.

He continues to supervise and train in pulmonology and critical care dating back to the time when he formed the first workers' health clinic in Durban. This clinic assisted workers with occupational health problems within a system that was heavily biased against people of colour and it also served as a centre for the evaluation and documentation of the treatment of political detainees and their health status upon release from detention.

As the Executive Director of the KwaZulu-Natal Enhancing Care Initiative (ECI) and the Principal Investigator of the International Clinical Trials Unit of the US Division of AIDS, he is passionate in his research to stem the suffering of those affected by HIV/AIDS. His passion transcends medical research to train and empower health professionals, especially in the rural areas, in the clinical knowledge and understanding of HIV/AIDS and tuberculosis.

Through the Medical Education Partnership Initiative (MEPI) of which he is the Programme Director, Lalloo is at the helm of spearheading initiatives that benefit communities. The MEPI is designed to support the goals of the United States President's Emergency Fund for AIDS Relief (PEPFAR) to train and retain 140 000 new health care

workers and improve the capacity of partner countries to deliver primary health care.

Recognised both nationally and internationally as an expert in the field of respiratory and HIV Medicine, he has played an integral role in the training of health care workers and the general public in HIV and TB management over many years.

His appointment to the Board of Directors of the Medical Research Council of South Africa by the national Minister of Health, Dr Aaron Motsoaledi, is testament to his outstanding leadership skills. He is currently the International Regent of the American College of Chest Physicians and was re-elected for a second three-year term in 2010.



RESEARCH AWARDS

VICE-CHANCELLOR'S RESEARCH AWARD

Dr Vincent Nyamori

The Vice-Chancellor's Research Award recognises exceptional research and research-related scholarly activities in young staff members and is awarded annually by the University Council on the recommendation of the Fellowships Selection and Awards Committee.

The most recent recipient of the prestigious award is Dr Vincent Nyamori, a senior lecturer in the School of Chemistry and Physics.

Nyamori is a member of the South African Nanotechnology Initiative (SANi) and is currently collaborating on nanotechnology projects as part of the India-Brazil-South Africa (IBSA) forum. He is also one of the principal investigators with the Nanotechnology Flagship Programme, Nano-Architecture in the Beneficiation of Platinum Group Metals, through the National Research Foundation (NRF).

He is also a member of the South Africa Chemical Institute (SACI) and the National Chair of the Green Chemistry Section.

His main research interests are in the following fields:

Nanotechnology* and Materials Science

Nyamori has published extensively on the synthesis of ferrocenyl derivatives and their use in the synthesis of shaped carbon nanomaterials (SCNMs). His current research focuses on the synthesis, functionalisation and doping of carbon nanotubes. The project involves the synthesis and use of novel ferrocenyl

derivatives as catalysts and dopants for SCNMs. His special interest has been on the synthesis and doping of multi-walled carbon nanotubes (MWCNTs). In particular, the nitrogen heteroatom has been chosen as a dopant for the MWCNTs. These nitrogen-doped multi-walled carbon nanotube (N-MWCNTs) materials should exhibit useful properties, especially with functional electromagnetic properties.



Sustainable Energy

The first aspect investigates the use of novel photovoltaic solar cells. The project involves functionalising carbon nanotubes (CNTs) with appropriate bulky conjugated ligands which would generate a CNT-hybrid that can harvest the sun's radiation.

The second area investigates CNTs as supports for fuel cell catalysts. The key issue is to have a good, effective catalyst, and at the same time an economical one. Platinum nanoparticles are used as the active metal while CNTs act as the support material in creating an effective catalyst for making fuel cells, which in turn are an invaluable source of clean, efficient, and renewable energy.

Green Chemistry

Nyamori also has a keen research interest in Green Chemistry projects, with particular emphasis on 'greener methods of synthesis'. He has devised a number of solventless or solvent-free reactions for the preparation of organometallic compounds. This has been with a bias towards the synthesis of ferrocenes or compounds incorporating palladium group metals (PGMs). He is also involved with research projects based on ionic liquids, mainly imidazolium- and phosphonium-based salts. Ionic liquids are meant to be cleaner and safer solvents compared with conventional organic solvents. He believes there is a need to be innovative and the ability to generate new technologies to create a sustainable society and environment is a crucial responsibility for chemists and other scientists.

** Nanotechnology involves making small-sized materials with dimensions within the nanoscale, i.e. 10⁻⁶ mm or millionth of a millimetre. The key importance of nanotechnology is that matter at nanoscale exhibit novel physical and chemical phenomena, properties and functions. This gives rise to new properties that allow for unusual applications of materials.*

OXFORD NUFFIELD MEDICAL FELLOWSHIP

Dr Senge Sibeko

Research Gynaecologist, CAPRISA

A caring approach and a burning passion for women's health – especially in the fight against HIV/AIDS – resulted in UKZN researcher, Dr Senge Sibeko, receiving the Oxford Nuffield Medical Fellowship 2011/2012.

Sibeko, who was overjoyed when she received the good news from the University of Oxford in England, said the fellowship would allow her “protected time to study towards a laboratory PhD in the UK” optimising her training towards developing and improving HIV preventive strategies for women.

Sibeko presented at the Multipurpose Prevention Technologies (MPT) for Reproductive Health Symposium in Washington where global experts on HIV prevention and sexual and reproductive health gathered to discuss and advance the emerging MPT science.

The aim of the symposium was to further the goal of providing women around the world with safe, effective,

low cost, and user-friendly means of protecting themselves simultaneously from HIV, other sexually transmitted and reproductive tract infections, and/or unintended pregnancy.

Sibeko spoke at the symposium on the issue of biological plausibility for the association between contraceptive use and HIV infection, an area in which she is currently conducting research.

She is a research gynaecologist at the Centre for the AIDS Programme of Research in South Africa (CAPRISA) while also working as a part-time consultant at Mahatma Gandhi Hospital in Phoenix, Durban. She joined CAPRISA as a post-doctoral Research Fellow in 2006 and was a senior scientist on the CAPRISA 004 tenofovir gel study.

Currently, she is the Protocol Co-chair for CAPRISA's Acute HIV Infection study and Co-Principal Investigator for tenofovir gel research for advancing HIV prevention science (TRAPS) study.



“ Dr Sibeko presented at the Multipurpose Prevention Technologies (MPT) for Reproductive Health Symposium in Washington where global experts on HIV prevention and sexual and reproductive health gathered to discuss and advance the emerging MPT science.”

CSIR BEST STUDENT AWARD

Ms Prabashni Lekha

PhD student in Biology

Ms Prabashni Lekha received the 2011 Best Student Award from the Natural Resources and the Environment Unit (NRE) at the Council for Scientific Research (CSIR).

This is an annual NRE award for excellent research work/results by a student.

Minimum standards for the award are:

- Evidence of above-average knowledge of the subject matter of the research work
- Evidence of a track record of high quality presentation of research at conferences or publication in peer-reviewed conference proceedings or in journals, or appropriate academic recommendations or achievements
- An excellent grasp of research processes and methodologies
- Excellent behavioural attributes, such as developing and maintaining good personal and professional relationships, making an active contribution as a team member, and generally demonstrating the CSIR's values.

Lekha's supervisors are Professor Pat Berjak, Professor Norman Pammenter and Dr Tammy Bush. The project is part of the ever-strengthening collaboration between the CSIR and the University of KwaZulu-Natal.



NATIONAL FIRST PRIZE IN STATISTICS

Ms Tarylee Reddy, Biostatistician, Medical Research Council

'An impressive piece of work' won Ms Tarylee Reddy first prize in the 2011 South African Statistics Association (SASA) national Postgraduate Student Paper Competition, sponsored by Statistics South Africa.

Reddy's paper, which focused on the research she conducted for her Masters on HIV disease progression, outclassed 14 other papers submitted by Masters and PhD students from around the country. Her supervisor, Professor Henry Mwambi, was not at all surprised she won the top award saying she was one of the best students he had encountered.

"She portrayed a lot of excellent skills in doing her research. She has an amazing capacity to work independently and is very focused," he said.

According to Reddy, although HIV is prevalent in sub-Saharan Africa, little research has been conducted on the rate of HIV progression and the contributing factors. In her research, she used multistate models to analyse her data which she obtained from the HIV Pathogenesis Programme (HPP) based at the University's Medical School. A key finding, which is consistent with previous research, is that the rate of decline in CD4 count decreases at lower levels. Reddy said: "It was also noted that patients enrolling with a CD4 count less than 350 had a far lower chance of immune recovery, and a substantially higher chance of immune deterioration compared to patients with a higher CD4 count. These findings reaffirm the need to initiate therapy at early stages of the virus, which could lead to the development of new treatment strategies and save more lives."

Currently employed as a biostatistician at the Medical Research Council (MRC) in Durban, Reddy completed her Masters degree with the assistance of a bursary she received from the South African Centre for Excellence in Epidemiological Modelling and Analysis (SACEMA).



DST WOMEN IN SCIENCE AWARDS

Women scientists at the University of KwaZulu-Natal (UKZN) scooped several national awards in various categories at the 2011 Annual Department of Science and Technology's (DST) Women in Science Awards (WISA). The awards were made by Minister of Science and Technology, Naledi Pandor, for outstanding scientific contributions to advance science and build the knowledge base in their respective disciplines.

WINNER: DISTINGUISHED WOMEN IN SCIENCE: LIFE, NATURAL AND ENGINEERING SCIENCES AWARD

Professor Quarraisha Abdool Karim

Associate Scientific Director, CAPRISA

During the two past decades, Professor Abdool Karim has committed her professional career to stopping the spread of HIV in South Africa.

As a principal researcher in the CAPRISA 004 scientific research programme, she demonstrated that tenofovir gel can prevent both HIV and Herpes Simplex Virus (HSV) Type 2 infection. The finding has been heralded as one of the most significant scientific breakthroughs in the fight against AIDS by the World Health Organization (WHO), UNAIDS and several leading organisations.

This year she has also been awarded the Drug Information Association's President's Award for Outstanding Achievement in World Health for research on the tenofovir gel microbicide; the Allan Rosenfield Alumni Award for Excellence; and the NSTF-BHP Billiton Award for Research Leading to Innovation.



SECOND RUNNER-UP: DISTINGUISHED WOMEN IN SCIENCE: SOCIAL SCIENCES AND HUMANITIES CATEGORY AWARD

Professor Deevia Bhana

Deputy Dean, College of Humanities

Professor Deevia Bhana, PhD (Natal) is a Professor in the School of Education, University of KwaZulu-Natal. She is a co-author of a book titled *Towards Equality? Gender in South African schools during the HIV/AIDS pandemic* (2009, UKZN Press) and a co-editor of the book *Babies and/or Books: Pregnancy and young parents at school* (HSRC, 2012). She has published in some of the most prestigious international journals in her field including *Social Science and Medicine*, *Ethnicities*, *British Journal of Sociology of Education*, *Discourse*, *Culture Health and Sexuality*.

She is regarded as a pioneer in the field of childhood sexualities in South Africa. Her work is underscored by an inter-disciplinary focus on childhood studies, sexualities and gender, political economy and the sociology of schooling. Bhana is a NRF C1-rated researcher.



DST WOMEN IN SCIENCE AWARDS

THE DISTINGUISHED YOUNG WOMEN IN SCIENCE: SOCIAL SCIENCES AND HUMANITIES AWARD

Professor Pearl Sithole

Associate Professor and Anthropologist, Community Development Programme

Professor Pearl Sithole scooped the Distinguished Young Women in Science: Social Sciences and Humanities Award for her sustained contribution in the areas of gender and development, traditional governance systems and the politics of knowledge production.

Sithole's areas of intellectual passion are knowledge production, governance and development, with specific focus on local government and traditional leadership, and gender analysis. Her innovative writings on African scholarship not only confront the politics of knowledge production, but also advance innovative mechanisms for the integration of advocacy and policy strands with theoretical relevance.



MASTERS FELLOWSHIP

Ms Anna Zawilska

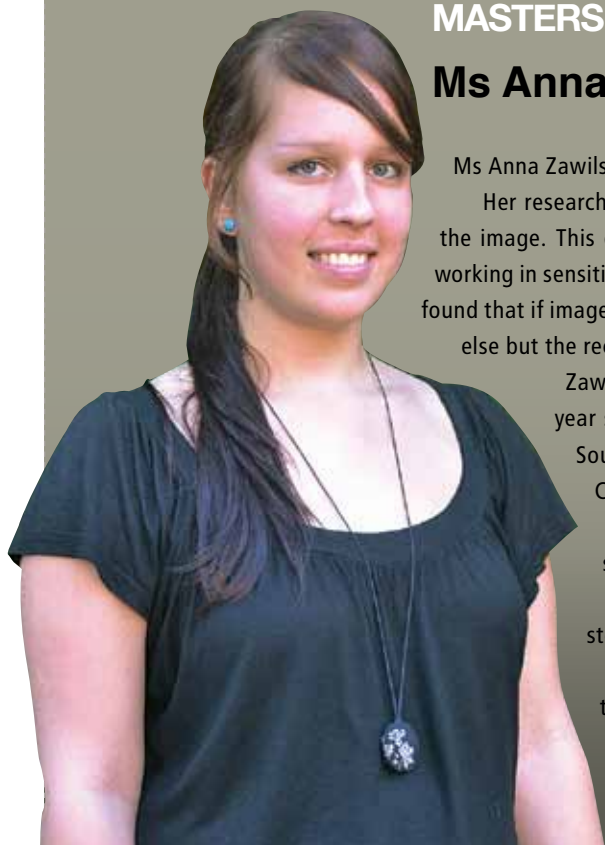
Ms Anna Zawilska completed her BSc in Electronic Engineering *summa cum laude* at UKZN in 2010.

Her research investigated how to embed data in images generally, irrespective of the content of the image. This opens up opportunities for more meaningful and rapid interaction between parties working in sensitive areas. The media interaction, for example, on the Internet is sizeable. The research found that if images could be loaded on the Internet with information that would not be seen by anyone else but the recipient, it would reduce the risk of exclusive information being used elsewhere.

Zawilska received the Engineering Council of South Africa Merit Award for being the final year student with the most outstanding results at UKZN in 2010, and second prize in the South African Institute of Electrical Engineers National Student Final Year Design Project Competition for her design project. She has an outstanding academic record, having obtained eight distinctions in matric coming first among learners at independent schools in KwaZulu-Natal and second overall in the district of Umlazi.

In 2011, she worked towards her MSc at UKZN in the field of digital image steganography which combines the topic of data security with image processing.

Zawilska's plans for the near future include reading for her DPhil in Computer Science in the field of human-computer interaction at Oxford University. This field is centred around usability issues of technology and the seamless integration of technology into our everyday lives. The exact topic of the DPhil will be developed further as the degree progresses.



DOCTORAL FELLOWSHIP

Ms Tricia Naicker

Finalising PhD studies within the GGKM Research Group

Ms Tricia Naicker, a 2011 recipient of the Department of Science and Technology's Women in Science award, is completing a PhD in Pharmaceutical Chemistry at UKZN's School of Health Sciences.

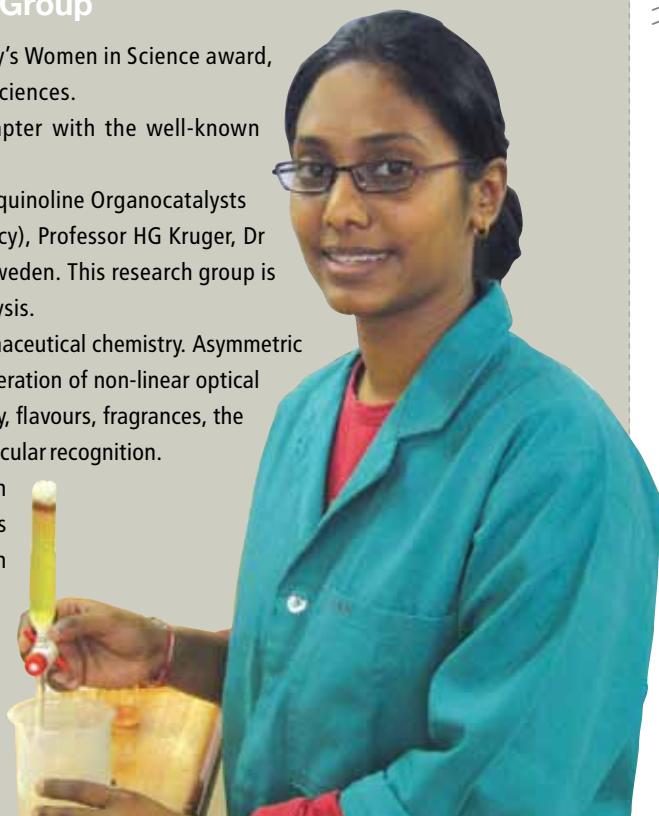
Naicker has produced 28 ISI peer-reviewed publications and a book chapter with the well-known scientific publishing house, Elsevier.

Naicker's PhD thesis titled: 'Synthesis and Evaluation of Novel Tetrahydroisoquinoline Organocatalysts in Asymmetric Catalysis', is being supervised by UKZN's Dr T Govender (Pharmacy), Professor HG Kruger, Dr GEM Maguire (Chemistry) and Professor PI Arvidsson of Uppsala University in Sweden. This research group is presently the only one in South Africa doing research in the field of organocatalysis.

Naicker's project covers one of the most cutting-edge research areas in pharmaceutical chemistry. Asymmetric catalysis is not only imperative to the pharmaceutical industry but also in the generation of non-linear optical devices, the control of polymer structure and properties, the agrochemical industry, flavours, fragrances, the study of nearly all biochemical processes and the pursuit of understanding molecular recognition.

This field has captured the attention of chemists around the world to such an extent that entire research groups are dedicated to the design, synthesis and testing of novel asymmetric organocatalysts. The last decade has seen an explosive growth in the number of studies in this field and it is currently one of the 'hottest' topics in organic synthetic research internationally.

Naicker completed a BSc (Honours) degree in 2006, a Masters Degree *cum laude* in Science in 2008 and is completing her PhD. She has been accepted for a post-doctoral fellowship in 2012 at the prestigious Centre for Catalysis at Aarhus University in Denmark.



DOCTORAL FELLOWSHIP

Ms Karen Pillay

PhD student, Department of Biochemistry

Ms Karen Pillay is a PhD student at the Department of Biochemistry at the University. Her research endeavours centre around the fact that currently there is no therapeutic agent that can slow down or stop the progression of type II diabetes.

Explaining the focus of her research, Pillay says that by using peptide-based inhibitors, she is hoping to develop molecules that will effectively arrest the progression of the disease by slowing down the toxic effect on pancreatic cells.

Pillay has an impeccable academic record. Having obtained six distinctions in Grade 12 – including mathematics, biology and physical science – she went on to complete her BSc degree in Biomedical Science *cum laude* and her BSc Honours degree *summa cum laude* at UKZN.

Her decision to pursue an MSc and PhD study in the fields of Chemistry and Biochemistry highlights her versatility in scientific research.



NRF LIFETIME ACHIEVEMENT AWARD

Professor Malegapuru Makgoba

Vice-Chancellor, UKZN

UKZN Vice-Chancellor Professor Malegapuru Makgoba was awarded the 2011 National Research Foundation (NRF) President's Lifetime Achievement Award for his 'extraordinary contribution to the development of science...'

Makgoba began his career at the Nelson R Mandela School of Medicine where he registered for a medical degree. His outstanding academic performance earned him a scholarship to Oxford where, as the first African Nuffield Dominion Fellow, he obtained a Doctor of Philosophy in Human Immunogenetics.

He was involved in several groundbreaking discoveries in immunology, with perhaps the most notable being seminal discoveries in four distinct but complementary areas in 1988 that led to a greater understanding of human immune responses.

Makgoba was a member of a group of National Cancer Institute researchers which included Dr Martin Sanders and Dr Stephen Shaw, who were among the first to appreciate the importance of lymphocyte adhesion. Their pioneering discoveries profoundly influenced the disciplines of immunology and cell biology. Makgoba was instrumental in demonstrating the importance of adhesion molecules in T-cell function through a series of what are now regarded as classic publications. These discoveries resulted in the expansion of knowledge of leukocyte adhesion, immunologic memory, direct intercellular interactions, and direct intercellular signalling in health and many disease states. These findings have impacted and continue to shape the approach and understanding of the pathophysiology, diagnosis and targeted therapy of a wide variety of disorders that include the major infectious

diseases afflicting the African continent – HIV/AIDS, malaria and tuberculosis.

This work, considered to be his most significant scientific contribution to molecular immunology, continues to inform basic research, diagnosis and treatment and is still highly cited. The total number of ISI citations for his 10 classic publications stands at 4 502.

His achievements have been lauded in South Africa and internationally. His awards include the Science-for-Society Gold Medal of the Academy of Science of South Africa; the Gold Medal for Outstanding Leadership in Medical Research; the National Science and Technology Forum's Award for Outstanding Contribution to Science, Engineering and Technology in South Africa; and a permanent display in the British National Museum of Science and Industry for 'popularising state-of-the-art science in the 20th Century'.

Makgoba has a deep commitment to the development of African scientists and the development of South Africa as a nation. He was the first Black South African appointed as the President of the Medical Research Council of South Africa and subsequently, the Vice-Chancellor of the University of KwaZulu-Natal. He is currently a member of the President's National Planning Commission and Special Advisor (Science) to Minister Naledi Pandor.

According to the NRF: "The Lifetime Achiever Award, introduced in 2004, is awarded to a deserving South African individual who is considered to have made outstanding extraordinary contribution(s) to the development of science, in and for South Africa, over an extended period of time. The contributions must be considered to be of international standard and impact."

UKZN Vice-Chancellor Professor Malegapuru Makgoba with Dr Albert van Jaarsveld, NRF Chief Executive Officer and the honourable Minister of Science and Technology, Mrs Naledi Pandor.



ICPPS AWARD

UKZN School of Pharmacy and Pharmacology academic received the Best Publication in Pharmacy Practice Award at the 6th International Congress on Pharmaceutical and Pharmacological Sciences (ICPPS).

BEST PUBLICATION IN PHARMACY PRACTICE AWARD

Dr Panjasaram Naidoo

Lecturer, UKZN School of Pharmacy and Pharmacology

Dr Panjasaram Naidoo received the Best Publication in Pharmacy Practice award for her journal article titled: 'The evaluation of the clinical management of HIV-infected patients by private sector doctors in the eThekweni Metro, KwaZulu-Natal.'

The article, published in the journal, *South African Family Practice*, interested many pharmacy academics and practitioners.

Naidoo's research interest is in HIV and AIDS and public health, and antiretroviral treatment distribution in the epicentre of the epidemic. She is actively involved in many committees, boards and councils of pharmacy and serves the profession at a national level. She was nominated by the Minister of Health to serve on the statutory council for pharmacists, the South African Pharmacy Council, from 2008 to 2013.



OXFORD SCHOLARSHIP

Dr Vivek Naranbhai

Deputy Director for Vaccine and Pathogenesis, CAPRISA

In 2010, Dr Naranbhai led a Cochrane review team studying interventions to prevent HIV in homeless youth. He will read for a second DPhil in Oxford in Clinical Medicine focusing on computational biology and molecular genetic epidemiology.

Between 2004-2009, Naranbhai was concurrently registered as the first student to combine an MBChB, a BSc. MedSci: Honours in Medical Microbiology and a Masters degree in Immunology. In 2007, he was the Fogarty-Ellison International Fellow and was the Pfizer Young Health Scientist of the year.

In 2008, he became a CAPRISA/LIFELab research fellow. Naranbhai graduated *summa cum laude* in 2009 from the Nelson R Mandela School of Medicine with both degrees, was the holder of the KZN prestige scholarship throughout university and was the NRMSM dux of 2009. He concurrently pursued a PhD in HIV immunology under the mentorship of UKZN, Columbia University and Harvard University-based researchers, and completed it in 2011.



PROLIFIC RESEARCHERS

These are researchers at the University of KwaZulu-Natal who have obtained three or more author units in DoHET accredited, peer reviewed journals.

College of Agriculture, Engineering and Science		
Title	Surname	First Names
Professor	Adali	Sarp
Professor	Banasiak	Jacek
Professor	Berjak	Patricia
Professor	Chimonyo	Micheal
Dr	Collier	Andrew
Professor	Crouch	Neil
Dr	Derera	John
Professor	Diab	Roseanne Denise
Professor	Domanska	Urszula
Professor	Downs	Colleen Thelma
Dr	Finnie	Jeffrey Franklin
Dr	Forbes	Andrew
Professor	Friedrich	Holger Bernhard
Professor	Gous	Robert Mervyn
Professor	Govinder	Keshlan Sathasiva
Dr	Green	Andrew Noel
Professor	Jewitt	Graham Paul Wyndham
Professor	Johnson	Steven Dene
Professor	Jonnalagadda	Sreekantha Babu
Dr	Korbanally	Neil Anthony
Professor	Kruger	Hendrik Gerhardus
Professor	Laing	Mark Delmege
Professor	Lawes	Michael
Professor	Leach	Peter Gavin
Dr	Maguire	Glenn Eamonn Mitchel
Professor	Maharaj	Bridgemohan
Dr	Manning	John
Professor	McKenzie	James Fairley
Professor	Meikap	Bhim Charan
Dr	Mohammadi	Amir
Professor	Nsahlai	Ignatius Verla
Dr	Nyamori	Vincent Onserio
Dr	Olaniran	Ademola Olufolahan
Dr	Olckers	Terence
Professor	Ortmann	Gerald Friedel
Professor	Pammenter	Norman William
Professor	Perissinotto	Renzo
Professor	Petrucione	Francesco
Professor	Pillay	Balakrishna
Professor	Ramjugernath	Deresh
Dr	Robinson	Ross Stuart
Professor	Sibanda	Precious
Professor	Slotow	Robert Hugh

College of Agriculture, Engineering and Science		
Title	Surname	First Names
Dr	Vadasz	Peter
Professor	van Staden	Johannes
Dr	van Zyl	Werner Ewald
Professor	Ward	David Mercer
College of Health Sciences		
Title	Surname	First Names
Professor	Abdool Karim	Salim Safurdeen
Dr	Biccard	Bruce McClure
Dr	Govender	Thavendran
Professor	Moodley	Jagidesa
Professor	Ndung'u	Peter Thumbi
Professor	Newell	Marie-Louise
Professor	Puckree	Threethambal
College of Humanities		
Title	Surname	First Names
Professor	Ballantine	Christopher John
Professor	Bond	Patrick Martin
Professor	Chapman	Michael James Faulds
Professor	Collier	John Donald
Professor	Decock	Paul Bernard
Professor	Draper	Jonathan Alfred
Professor	Hilton	John Laurence
Dr	Maharaj	Pranitha
Professor	Matthias	Carmel Rose
Professor	Mccracken	Donal Patrick
Dr	Morojele	Pholoho Justice
Dr	Msibi	Thabo Perceviarence
Professor	Muthukrishna	Anbanithi
Professor	Nadar	Sarojini
Dr	Naidu	Uma Mahesvari
Professor	Posel	Dorrit Ruth
Professor	Sooryamoorthy	Radhamany
Professor	Stilwell	Christine
Professor	Wassermann	Johannes Michiel
Professor	West	Gerald Oakley
College of Law and Management Studies		
Title	Surname	First Names
Professor	Brijball Parumasur	Sanjana
Mr	Buthelezi	Michael Celumusa
Professor	Carnelley	Marita
Professor	Du Plessis	Maximillian
Professor	Freedman	David Warren
Dr	Govender	Pathmavathie
Professor	Harris	Geoffrey Thomas
Professor	Hector	Shannon Vaughn
Professor	Maharaj	Manoj Sewak
Professor	Mcquoid-Mason	David Jan
Professor	Penceliah	Yoganandee
Professor	Reddy	Purshottama Sivanara
Professor	Tewari	Devi Datt
Ms	Whitear-Nel	Nicola Jane

TOP PUBLISHED RESEARCHERS

These are UKZN's Top Published Researchers in DoHET accredited, peer-reviewed journals. Researchers who have accumulated the most amounts of author units are ranked from highest to lowest to establish the top 30 published researchers.



Top Published Overall 2011

Professor Johannes van Staden

Professor Johannes van Staden achieved his BSc and MSc in Botany from the University of Stellenbosch in the Western Cape, where he also lectured.

After joining the former University of Natal, he received a PhD in Botany in 1970. In 1999 he became Director of his own postgraduate research centre – the Research Centre for Plant Growth and Development.

Van Staden has been a Research Fellow at the University College of Wales, the University of California, the Hebrew University of Jerusalem, Broom's Barn Experimental Station in the United Kingdom, and the University of West-Hungary, where he was awarded an Honorary DSc. He was also a visiting lecturer at the National Australian University

In his career he has worked in many areas of Plant Sciences/Botany, but specifically in the fields of plant hormones, seed germination, senescence, stress physiology, post-harvest physiology, biotechnology and plant tissue culture, ethnobotany, secondary products and ethnomedicine.

He is the author and co-author of 1 110 (2011) papers which have been published in ISI-rated journals and since 2002 he fell within the top 0.5 percent of the internationally most cited authors. Van Staden, who is the recipient of numerous awards and prizes in his field, is the Editor-in-Chief for the *South African Journal of Botany and Plant Growth Regulation* and an Associate Editor of the *Journal of Ethnopharmacology*. He serves on the Editorial Board of six other journals.



Top Woman Published 2011

Professor Colleen T Downs

Research by Professor Colleen Downs of the School of Life Sciences on the Pietermaritzburg campus has made an important contribution to understanding the relationships between the physiology, behaviour and ecology of southern African terrestrial vertebrates, especially leopard tortoises, Nile crocodiles, various bird species and small mammals. Some of this relates to understanding the evolution of endothermy and also the phenotypic flexibility that the species have in terms of accelerated climate change scenarios. Much of this research contributes to the conservation of these species. She has several postgraduate students working on the ecology of various bird and mammal species with changing land use, particularly urban and farmland areas.

Of her 132 published papers up to 2010, about 27 percent relate to vertebrate dietary aspects including water and energy turnover – especially frugivory and nectarivory; about 26% to aspects of vertebrate thermal biology, including those that relate to thermoregulation and behaviour; about 43% to vertebrate conservation and ecology; and about 7% to science education.

She is on the editorial boards and committees of various scientific bodies and has participated in review panels. Downs has organised the annual national Cape Parrot Counting Day for the past 13 years. This has involved liaising with public volunteers nationally (about 300 people), producing reports, magazine articles, and making public presentations. She is currently the Chairperson of the Cape Parrot Working Group based at UKZN. She is scientific chair for the Pan African Ornithological Congress 13 to be held in Arusha, Tanzania in 2012.

TOP 30 PUBLISHED RESEARCHERS

Position	Title	First Names	Surname	College
1	Professor	Johannes	van Staden	College of Agriculture, Engineering and Science
2	Dr	Glenn Eamonn Mitchel	Maguire	College of Agriculture, Engineering and Science
3	Professor	Holger Bernhard	Friedrich	College of Agriculture, Engineering and Science
4	Dr	Amir	Mohammadi	College of Agriculture, Engineering and Science
5	Professor	Robert Mervyn	Gous	College of Agriculture, Engineering and Science
6	Professor	Hendrik Gerhardus	Kruger	College of Agriculture, Engineering and Science
7	Professor	Colleen Thelma	Downs	College of Agriculture, Engineering and Science
8	Professor	Christopher John	Ballantine	College of Humanities
9	Professor	Steven Dene	Johnson	College of Agriculture, Engineering and Science
10	Professor	Deresh	Ramjugernath	College of Agriculture, Engineering and Science
11	Professor	Patrick Martin	Bond	College of Humanities
12	Professor	Micheal	Chimonyo	College of Agriculture, Engineering and Science
13	Dr	Thavendran	Govender	College of Health Sciences
14	Professor	Mark Delmege	Laing	College of Agriculture, Engineering and Science
15	Professor	David Mercer	Ward	College of Agriculture, Engineering and Science
16	Professor	Neil	Crouch	College of Agriculture, Engineering and Science
17	Professor	Sreekantha Babu	Jonnalagadda	College of Agriculture, Engineering and Science
18	Dr	Uma Mahesvari	Naidu	College of Humanities
19	Professor	Balakrishna	Pillay	College of Agriculture, Engineering and Science
20	Dr	John	Manning	College of Agriculture, Engineering and Science
21	Professor	Bhim Charan	Meikap	College of Agriculture, Engineering and Science
22	Professor	Jagidesa	Moodley	College of Health Sciences
23	Professor	Christine	Stilwell	College of Humanities
24	Professor	Renzo	Perissinotto	College of Agriculture, Engineering and Science
25	Ms	Nicola Jane	Whitear-Nel	College of Law and Management Studies
26	Professor	Urszula	Domanska	College of Agriculture, Engineering and Science
27	Dr	Werner Ewald	van Zyl	College of Agriculture, Engineering and Science
28	Professor	Robert Hugh	Slotow	College of Agriculture, Engineering and Science
29	Professor	Francesco	Petrucione	College of Agriculture, Engineering and Science
30	Professor	Johannes Michiel	Wassermann	College of Humanities
30	Professor	Paul Bernard	Decock	College of Humanities

TOP PUBLISHED RESEARCHERS



Professor Johannes van Staden



Dr Glenn Maguire



Professor Holger Friedrich



Dr Amir Mohammadi



Professor Robert Gous



Professor Gerhardus Kruger



Professor Colleen Downs



Professor Christopher Ballantine



Professor Steven Johnson



Professor Deresh Ramjugernath



Professor Patrick Bond



Professor Michael Chimonyo



Dr Thavendran Govender



Professor Mark Laing



Professor David Ward



Professor Neil Crouch



Professor Sreekantha
Jonnalagadda



Dr Uma Naidu



Professor Balakrishna Pillay



Dr John Manning



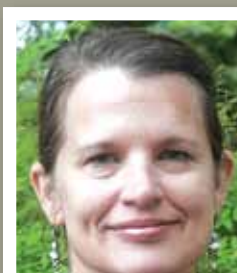
Professor Bhim Charan Meikap



Professor Christine Stilwell



Professor Renzo Perissinotto



Ms Nicola Jane Whitear-Nel



Professor Urszula Domanska



Dr Werner Ewald van Zyl



Professor Robert Hugh Slotow



Professor Francesco Petruccione



Professor Johannes Michiel
Wassermann



Professor Paul Bernard Decock

A photograph of Professor Jagidesa Moodley was not available at the time of publication.

EMERGING RESEARCHERS

These are researchers at the University of KwaZulu-Natal who are below the Professorial level, and beginning to make a significant contribution in their field and who have the potential to become prolific researchers. They are 40 years and younger and have accumulated one or more author units in DoHET accredited, peer-reviewed journals.

College of Agriculture, Engineering and Science		
Title	Surname	First Names
Mr	Akerman	Matthew Piers
Dr	Baiyegunhi	Lloyd James Segun
Ms	Bengesai	Annah Vimbai
Dr	Booyesen	Irvin
Mr	Brooks	Michael John
Ms	Carrasco	Nicola Kim
Dr	Chaplot	Vincent
Dr	Chetty	Naven
Ms	Chitja	Joyce Magoshi
Dr	Codron	Daryl Mark
Dr	Islam	Shahidul
Dr	Kana	Gueguim
Dr	McCreadie	Heather
Dr	Mokotedi	Mompe Edward Oscar
Dr	Moodley	Brenda
Dr	Mukwembi	Simon
Dr	Mutanga	Onisimo
Dr	Naidoo	Paramespri
Dr	Niesler	Carola Ulrike
Dr	Owaga	Bernard Omondi
Dr	Pillay	Nelishia
Dr	Proches	Mihai Serban
Dr	Ramroop	Shaun
Dr	Reddy	Desigan
Dr	Smit	Albertus Jacobus
Dr	Sommer	Paula
Dr	Titshall	Louis William
Dr	Tong-Viet	Hung Phi
Dr	Tyler	Nicola Claire
Dr	Willows-Munro	Sandi
Dr	Zegeye	Wale Edilegnaw
College of Health Sciences		
Title	Surname	First Names
Dr	Ellapen	Terry Jeremy
Ms	Esterhuizen	Tonya Marianne

College of Health Sciences		
Title	Surname	First Names
Ms	Geils	Catherine Barbara
Dr	Hansraj	Rekha
Ms	Hargreaves	Angel Thobekile
Dr	Kasprowicz	Victoria
Dr	Lessells	Richard John
Mr	Mashige	Khathutshelo Percy
Mr	Moodley	Yoshan
Ms	Naidoo	Pragashnie
Ms	Naidu	Thirusa
Dr	Rodseth	Reitze Nils
Dr	Tanser	Frank Courtney
College of Humanities		
Title	Surname	First Names
Dr	Bass	Orli
Dr	Casale	Daniela Maria
Dr	Cebekhulu	Elias
Ms	Craighead	Clare Leslie
Dr	De La Porte	Susan Elizabeth
Ms	Hammerschlag	Tamantha Anne
Mr	Maphosa	Cosmas
Dr	Matolino	Bernard
Mr	Mawowa	Showers
Dr	Mgqwashu	Emmanuel Mfanafuthi
Dr	Ngwenya	Pamela Ellen
Dr	Ojong	Vivian Besem
Mr	Quayle	Michael Frank
Dr	Raniga	Tanusha
Dr	Rudwick	Stephanie Inge
Ms	Scott	Claire
Ms	Slack	Catherine May
College of Law and Management Studies		
Title	Surname	First Names
Ms	Casale	Marisa Angela Judy
Ms	Couzens	Meda Mihaela
Ms	Dawad	Suraya
Ms	Forere	Malebakeng Agnes
Mr	George	Gavin Lloyd
Dr	Ndlovu	Fikile Portia
Dr	Ruggunan	Shaun Denvor
Dr	Singh	Jerome Amir
Ms	Soni	Sheetal
Mr	Strydom	Barry Stephen
Mr	Subramanien	Darren Cavell
Mr	Surbun	Vishal
Mr	Thabane	Tebello
Library		
Title	Surname	First Names
Mr	Cele	Jabulani Vusumuzi Mwelela

DOCTORAL GRADUATES

College of Agriculture, Engineering and Science			
Surname	Initials	Qualification	Thesis
Ali	PY	Doctor of Philosophy	Aspects of Distance Measures in Graphs
Awad	FGA	Doctor of Philosophy	Double-diffusive convection flow in porous media with cross-diffusion
Basha	NAD	Doctor of Philosophy	Feeding behaviour, diet selection of goats and nutritive value of browse species in sub-humid subtropical savannah, South Africa
Bucheyeki	TL	Doctor of Philosophy	Characterisation and genetic analysis of maize germplasm for resistance to northern corn leaf blight disease in Tanzania
Bulcock	HH	Doctor of Philosophy	An assessment of canopy and litter interception in commercial and indigenous forests in the KwaZulu-Natal Midlands, South Africa
Buthlezi	SP	Doctor of Philosophy	Characterisation and applications of xylanases produced by <i>bacillus spp</i> isolated from decaying trees in Durban
Cavero	M	Doctor of Philosophy	The Structural and Mechanical Properties of the Pt-Ti and Ir-Ti Systems
Chetty	L	Doctor of Philosophy	Design Synthesis of LCC HVDC Control Systems
Chinsamy	M	Doctor of Philosophy	South African Medicinal Orchids: A Pharmacological and Phytochemical Evaluation
Choveaux	DL	Doctor of Philosophy	Recombinant expression and initial characterisation of two Plasmodium copper binding proteins
Couth	RJ	Doctor of Philosophy	Assessment of Carbon Emission Reductions in Africa from Improved Waste Management
Eksteen	AB	Doctor of Philosophy	Growth Characteristics of Three Eucalyptus Clonal Hybrids in Response to Drought Stress: The Underlying Physiology
El-Hassimi Sow	M	Doctor of Philosophy	Genetic diversity of Oryza species in Niger; screening and breeding for resistance to Rice yellow mottle virus (RYMV)
Fon	FN	Doctor of Philosophy	The fibrolytic potential of domestic and wild herbivores microbial ecosystems
Godfrey	LK	Doctor of Philosophy	The Role of Waste Data in Changing Behaviour: The Case of the South African Waste Information System (SAWIS)
Goswami	A	Doctor of Philosophy	Asymptotic Analysis of Singularly Perturbed Dynamical Systems
Gumbi	DP	Doctor of Philosophy	The impact of change in climate, human demography, and other social factors on the fire regime of the Kogelberg Nature Reserve
Hajari	E	Doctor of Philosophy	Development of Strategies towards the Cryopreservation of Germplasm of <i>Ekebergia capensis</i> Sparrm. – An Indigenous Species that Produces Recalcitrant Seeds
Jeena	V	Doctor of Philosophy	The application of semiconductors as oxidants in synthetic organic chemistry
Jordaan	LA	Doctor of Philosophy	Fleshy-fruited invasive alien plants and frugivores in South Africa
Kagoda	F	Doctor of Philosophy	Genetic studies and recurrent selection for nematode resistance in maize, incorporating farmers' perceptions and preferences for resistant cultivars
Kam	H	Doctor of Philosophy	A Study of the Diversity of Burkina Faso Rice Landraces and Identification of Source of Resistance to Rice yellow mottle virus (RYMV)
Kamau	JN	Doctor of Philosophy	Investigating the Pathway and Fate of Inorganic Impurities in a Bisulfite Dissolving Pulp Production Process
Kangethe	RT	Doctor of Philosophy	Gene disruption of TcoCATL (congopain) and oligopeptidase B, pathogenic factors of African trypanosomes
Kiplimo	JJ	Doctor of Philosophy	The Phytochemistry and Biological Activity of Secondary Metabolites from Kenyan Vernonia and Vepris
Lagendijk	DDG	Doctor of Philosophy	The Effects of Elephant and Mesoherbivores on Woody Vegetation
Laufer	Z	Doctor of Philosophy	Occurrence and properties of the multicopper oxidases laccase and tyrosinase in lichens
Lokhat	D	Doctor of Philosophy	Gas-Phase Epoxidation of Hexafluoropropylene
Madlala	PZ	Doctor of Philosophy	Association of Genetic Polymorphisms in Select HIV-1 Replication Cofactors with Susceptibility to HIV-1 Infection and Disease Progression
Mafusire	C	Doctor of Philosophy	Modelling and Measurement of Optical Aberrations of Laser Beams Propagating Through Random Media
Maharaj	L	Doctor of Philosophy	Optimal design of a secondary milling circuit for treating chromite-rich UG-2 platinum ores
Makelo	MN	Doctor of Philosophy	Development of pigeonpea [<i>Cajanus cajan</i> (L.)] hybrids for the semi-arid Kenya

College of Agriculture, Engineering and Science			
Surname	Initials	Qualification	Thesis
Makukula	GZ	Doctor of Philosophy	On new and improved semi-numerical techniques for solving nonlinear fluid flow problems
Mansour	KMY	Doctor of Philosophy	Rangeland degradation assessment using remote sensing and vegetation species
Marimuthu	T	Doctor of Philosophy	The Preparation and Novel Application of Diphosphorus Xanthene Family Ligands in Homogeneous Catalysis
Mather	AA	Doctor of Philosophy	The Risk, Management and Adaptation of Sea Level Rise and Coastal Erosion along the Southern and Eastern African Coastline
Mbatha	NB	Doctor of Philosophy	Mesosphere-Lower Thermospheric (MLT) Atmosphere structure Coupling and Dynamics using HF Radar System, Ground Based LIDAR, Satellites and Models
Mboya	RM	Doctor of Philosophy	A study of the effects of storage methods on the quality of maize and household food security in Rungwe District, Tanzania
Miranda	NAF	Doctor of Philosophy	Ecophysiology and Population Dynamics of the Alien Invasive Gastropod <i>Tarebia granifera</i> in the iSimangaliso Wetland Park, South Africa
M'thruaine	CM	Doctor of Philosophy	Synthesis and Characterisation of Iron Amine Complexes
Mtshali	NP	Doctor of Philosophy	Molecular characterisation of acid phosphatase in <i>Cladonia portentosa</i>
Muitia	AM	Doctor of Philosophy	Farmers perceptions and genetic studies of rosette disease in groundnut (<i>Arachis hypogaea</i> L.) in northern Mozambique
Mulaudzi	RB	Doctor of Philosophy	Pharmacological evaluation of medicinal plants used by Venda people against venereal and related diseases
Mushongi	AA	Doctor of Philosophy	Genetic studies of secondary traits and yield heterosis in maize under high and low nitrogen conditions, incorporating farmer perceptions and preferences for varieties
Musyoka	SM	Doctor of Philosophy	Surface Functionalisation of Cellulose and Chitosan Nanofibers for Remediation of Heavy Metals in Water
Muya Kasanda	S	Doctor of Philosophy	Initial Conditions of the Universe: Signatures in the Cosmic Microwave background and baryon Acoustic Oscillations
Mzinyane	TD	Doctor of Philosophy	A Quantitative Assessment of the Impacts of Water Status and Chemical Bioassays on Structural Attributes of Eucalyptus Clones and Plantation Soil Nitrogen using Hyperspectral Data
Nadasan	DS	Doctor of Philosophy	The Invasive Potential of the Freshwater Snail <i>Radix rubiginosa</i> Recently Introduced into South Africa
Nakhooda	M	Doctor of Philosophy	The actions of, and interactions between, auxins and cytokinins and their effect on in vitro rooting of selected Eucalyptus clones
Narasigadu	C	Doctor of Philosophy	Design of a Static Micro-Cell for Phase Equilibrium Measurements: Measurements and Modelling
Njoya	NS	Doctor of Philosophy	Causes of Wetland Erosions at Craigieburn, Mpumalanga Province, South Africa
Nwobi	FN	Doctor of Philosophy	Applications of Symmetry Analyses of Partial Differential and Stochastic Differential Equations arising from Mathematics of Finance
Oketch	JA	Doctor of Philosophy	Community-based nutrition care and support programs for HIV-positive adults: An analysis of information for planning in resource-limited settings, KwaZulu-Natal, South Africa
Olupot	JR	Doctor of Philosophy	Genetic Analysis of <i>Striga hermonthica</i> Resistance in Sorghum (<i>Sorghum bicolor</i>) Genotypes in Eastern Uganda
Oyede	RT	Doctor of Philosophy	Phytochemical studies of some African Medicinal Plants
Pauck	WJ	Doctor of Philosophy	Neural Network Modelling and Prediction of the Flotation Deinking Behaviour of Complex Recycled Paper Mixes
Penderis	CA	Doctor of Philosophy	Browse: quantity and quality of evergreen and deciduous tree species in semi-arid southern African savannas
Pillay	K	Doctor of Philosophy	Nutritional quality and consumer acceptability of provitamin A-biofortified maize
Pillay	S	Doctor of Philosophy	Membrane Fouling Mechanisms in a Membrane-Coupled Anaerobic Baffled Reactor (ABR) Treating a Complex Wastewater
Rodger	JG	Doctor of Philosophy	Consequences of self-fertilisation for fecundity and progeny performance in invasive plants
Rukera Tabaro	S	Doctor of Philosophy	Optimisation of an Innovative System of Sustainable Production in Rwanda: The Integrated Rabbit-Fish-Rice System
Salmond	RC	Doctor of Philosophy	Synthesis and Characterisation of New Schiff Base Chelates of Platinum Group Metals
Salomon	ML	Doctor of Philosophy	Keeping cattle in a changing rural landscape: Communal rangeland management in Okhombe, KwaZulu-Natal, South Africa
Selepe	MAM	Doctor of Philosophy	Synthesis and analysis of Eriosema isoflavonoids and derivatives thereof

DOCTORAL GRADUATES

College of Agriculture, Engineering and Science			
Surname	Initials	Qualification	Thesis
Seretlo	TT	Doctor of Philosophy	Fischer Clifford Matrices and Character Tables of Certain Groups Associated with Simple Groups $O+10(2)$, HS and Ly
Singh	T	Doctor of Philosophy	Ab Initio mechanistic studies of cage lactams
Sonopo	MS	Doctor of Philosophy	Strategies for the synthesis of benzyltetrahydroisoquinoline alkaloids
Steenhuisen	SL	Doctor of Philosophy	Mating systems, insect pollination and chemical ecology of grassland Protea species (<i>Proteaceae</i>)
Swart	PA	Doctor of Philosophy	Propagation of Romulea species
Tedder	MJ	Doctor of Philosophy	Dry woodland and savanna vegetation dynamics in the eastern Okavango Delta, Botswana
Vaughan	HC	Doctor of Philosophy	Bioremediation of leachate from selected landfill sites in KwaZulu-Natal using a novel forced-upflow bioreactor
Vukea	PR	Doctor of Philosophy	Characterisation of infectious bursal disease virus (IBDV) polyprotein processing
Wallis	PD	Doctor of Philosophy	The effects of land use and management practices on the soil microbial diversity as determined by PCR-DGGE and CLPP
Wiles	NL	Doctor of Philosophy	The tuck shop purchasing practices of Grade 4 learners at selected primary schools in Pietermaritzburg, South Africa
Woyengo	VW	Doctor of Philosophy	Cassava breeding through complementary conventional and participatory approaches in western Kenya
Yao	KN	Doctor of Philosophy	A Genetic Study of Resistance to African Rice Gall Midge in West African Rice Cultivars
Young	MB	Doctor of Philosophy	Improving the Nutritional Representation of Horse Feeds in South Africa
College of Health Sciences			
Surname	Initials	Qualification	Thesis
Aderemi	TJ	Doctor of Philosophy	HIV/AIDS knowledge, attitudes and practices among the intellectually impaired and mainstream learners in selected schools in Oyo State, Nigeria
Akin-Otiko	BO	Doctor of Philosophy	Facilitation of behaviour change communication process for maternal, newborn and child health and primary health care level of midwifery practice in Kaduna State
Archary	D	Doctor of Philosophy	Neutralising antibody responses and viral evolution in a longitudinal cohort of HIV subtype C infected antiretroviral-naïve individuals
De Beer	J	Doctor of Philosophy	Towards enhancing family care during critical illness in intensive care units (ICU) in the Durban Metropolitan Area, in KwaZulu-Natal
Govender	MM	Doctor of Philosophy	The role of angiotensin II and oxidative stress in the spontaneously hypertensive rat
Harrikaran	P	Doctor of Philosophy	An investigation into anaerobiosis of Mycobacterium tuberculosis
Jolayemi	AT	Doctor of Philosophy	Studies on some pharmacological properties of Capsicum frutescens-derived capsaicin in Experimental animal models
Moodley	N	Doctor of Philosophy	Neuropsychological functioning adjustment in spinal cord injured patients
Murambiwa	P	Doctor of Philosophy	Effects of novel chloroquine formulations on blood glucose concentration, renal and cardiovascular function in experimental animal paradigms
Naicker	T	Doctor of Philosophy	Synthesis and evaluation of novel tetrahydroisoquinoline organocatalysts in asymmetric catalysis
Naidoo	SS	Doctor of Philosophy	The Impact of a brief intervention programme on Suicidal Behaviour in a local South African Community
Naidoo	JR	Doctor of Philosophy	A grounded theory Inquiry: Establishing Communities of Practice among HIV/AIDS nurses practitioners through the use of Critical Reflection at selected hospitals in KwaZulu-Natal
Omisakin	FD	Doctor of Philosophy	Developing, Testing and Refining of a model for implementation of HIV/AIDS Self-management education in a semi-rural area in KwaZulu-Natal, South Africa
Ramduth	D	Doctor of Philosophy	Characterization of CD4+ T-Helper Cell Responses in Paediatric HIV-1 C-Clade Infection
Ramesar	SV	Doctor of Philosophy	The effect of sildenafil citrate and kraussianone-2 on pre-eclampsia-like manifestations in Sprague-Dawley rats
Razak	A	Doctor of Philosophy	An Exploratory Study Towards Disclosure of Status and Reduction of Stigma for People living with HIV/AIDS in a Low Income community
Sithole	MB	Doctor of Philosophy	Post traumatic stress in women and children who have been sexually abused
Thobakgale	CF	Doctor of Philosophy	HIV specific CD8+ T cell responses in infected infants enrolled on a study of early highly active antiretroviral treatment (Haart) and supervised treatment interruption
Wright	JK	Doctor of Philosophy	Impact of Immune-Driven Sequence Variation in HIV-1 Subtype C Gag and Protease on Viral Fitness and Disease Progression

College of Humanities			
Surname	Initials	Qualification	Thesis
Alabi	AS	Doctor of Philosophy	Housing Delivery Systems: An Evaluation of Public-Private Partnerships toward provision of adequate housing for the middle-income group in Lagos Nigeria
Andrewus	DG	Doctor of Philosophy	A critique of discrimination on the basis of poverty in the Epistle of James: A case study of the Church of the Brethren Gavva Area
Arbee	A	Doctor of Philosophy	Knowledge and knowers in the discipline of Marketing at the University of KwaZulu-Natal
Badassy	P	Doctor of Philosophy	A Severed Umbilicus: Infanticide and the concealment of birth in Natal, 1860-1935
Bazubagira	AK	Doctor of Philosophy	An exploration of community perceptions and understandings of Rwandan Genocide Memorials
Blackbeard	DR	Doctor of Philosophy	Adolescent boys living with HIV
Busingye	JD	Doctor of Philosophy	Reducing risk: Local knowledge for livelihoods security amongst Ugandan small holder crop farmers
Campbell	LM	Doctor of Philosophy	Certain the curriculum; uncertain the practice: Palliative care in context
Clare	J	Doctor of Philosophy	A critical examination of Richard Rorty's liberal lexicon
David	SAJ	Doctor of Philosophy	A retrospective and a prospective reading of John 1:1-18 using the method of Biblical Rhetorical Analysis
Dyll-Myklebust	LE	Doctor of Philosophy	'Lodge-ical' Thinking and Development communication: !Xaus Lodge as Public-Private-Community Partnership in Tourism
Erwin	K	Doctor of Philosophy	Place, race and belonging: A case study in Albert Park, Durban
Ferreira-Meyers	KAF	Doctor of Philosophy	Comparative analysis of autofictional features in the works of Amélie Nothomb, Calixthe Beyala and Nina Bouraoui
Goba-Malinga	NU	Doctor of Philosophy	Sexual Harassment in the Workplace: A case study of women's experiences at Walter Sisulu University, Eastern Cape
Gondongwe	K	Doctor of Philosophy	African Ministers and the emergence of resistance to Colonial domination. The development of indigenous clergy in the Wesleyan Methodist Church in Zimbabwe from 1891-1980
Gqibitole	KM	Doctor of Philosophy	Creativity or Control? A study of selected Xhosa radio plays in the apartheid years
Greenbank	MF	Doctor of Philosophy	Who is teaching journalism? A scholarly personal narrative
Hondy	R	Doctor of Philosophy	The role of generic communication in preparing students for engineering workplace practices
Jairam	V	Doctor of Philosophy	Child sexual abuse: A construct reconsidered
Jojo	ZMM	Doctor of Philosophy	An APOS exploration of the conceptual understanding of the chain rule in Calculus by the first year Engineering students
Joseph	RR	Doctor of Philosophy	An exploration of rural communities and Government response strategies to drought in South Africa: The case of Msinga villages in KwaZulu-Natal province
Karikan	KM	Doctor of Philosophy	Power and subjectivity in leadership and management: An ethnographic study of South African school
Kissoon-Singh	P	Doctor of Philosophy	The Dental Therapy Curriculum: Meeting needs and challenges for oral health care in South Africa
Mackay	JR	Doctor of Philosophy	"We shouldn't have to do this; we're girls!": An examination of gender, self-efficacy and conceptual understanding in electro-technology or a class of teachers trainees in design and technology at a South African University
Maeresera	S	Doctor of Philosophy	Military interventions in African conflicts: The Southern African Development Community coalition of the Willing's Military Intervention in the Democratic Republic of Congo, 1998-2002
Maharajh	S	Doctor of Philosophy	The changing dynamics of teacher Learning: An exploration study of teacher learning through the lens of assessment
Molapo	LF	Doctor of Education	Linking formal environmental knowledge with everyday practices: A case study of three Lesotho secondary schools
Mugabe	MJ	Doctor of Philosophy	Support structures and strategies used by adults to cope with distance learning
Mutinta	GC	Doctor of Philosophy	Investigating students sexual risk behaviour, risk and protective factors and their responses to the Scrutinize Campaign at Universities in KwaZulu-Natal
Ogunbanwo	BF	Doctor of Philosophy	A socio-scientific reading in the Yoruba context of selected texts in Luke's Gospel portraying Jesus attitude to outcasts: Implications for Anglican Dioceses in Ijebu-Remo, Ogun State, Nigeria in the HIV and AIDS era

DOCTORAL GRADUATES

College of Humanities			
Surname	Initials	Qualification	Thesis
Paideya	V	Doctor of Philosophy	The phenomenon of learning: First year Engineering students' engagement with Chemistry supplemental instruction
Partab	R	Doctor of Philosophy	Challenging violent masculinities: A critical feminist investigation of the relationship between domestic violence and religion
Paruk	Z	Doctor of Philosophy	Parenting in the time of Aids
Pillay	IP	Doctor of Philosophy	Recovered from Obscurity: 'Structures of Feeling', Discourses of identity and power relations through the peripheral characters in the novels of Charles Dickens
Ralfe	EM	Doctor of Philosophy	Changing gender perception: The case of a classroom based critical literacy intervention
Rogan	MJ	Doctor of Philosophy	The feminisation of poverty and female headship in post-apartheid South Africa, 1997-2006
Sigaba	AL	Doctor of Philosophy	A pastoral marriage and family wholeness programme: A contextual cross-cultural contribution to enrichment, growth and healing through pastoral care and counselling in the South African context, with particular focus on Methodist families in the community of KwaNdengezi in KwaZulu-Natal
Smith	RA	Doctor of Philosophy	Youth, Media and Lifestyles: An audience study on media (television) consumption and lifestyles of black youths living in both Durban and Alice, South Africa
Sookrajh	R	Doctor of Philosophy	Sport tourism events in the Durban: Stakeholder Perceptions and the Impact on Local Economic Development (LED) Strategies
Sprong	JL	Doctor of Philosophy	'For healing and transformation': A feminist ecclesiological study on the gap between gender policy and practice in the methodist church of Southern Africa (MCSA)
Yates	SD	Doctor of Philosophy	RAT online: Design, Delivery and Evaluation of constructivist computer supported Martial Arts and Learning Environments
Zaihlita	Z	Doctor of Philosophy	The understanding of humility (Anawa) in the Book of Proverbs (Prov.10:1-22:16) and its relevance in the context of the Malagasy people
Zhuwau	T	Doctor of Philosophy	Sexual practices and the cultural meanings of rural people in Zimbabwe in the era of the Human Immunodeficiency Virus (HIV) and Acquired Immunodeficiency Syndrome (AIDS) epidemic: A social constructionist perspective
College of Law and Management Studies			
Surname	Initials	Qualification	Thesis
Bokana	KG	Doctor of Philosophy	Performance of Students in the College of Law and Management Studies UKZN: An Econometric Analysis
Coetzee	CE	Doctor of Philosophy	A Research Approach to Keeping Informed of and Monitoring Local Economic Conditions: A KwaZulu-Natal Case Study
Du Plessis	M	Doctor of Philosophy	African Responses to the International Criminal Court – the Southern African Development Community Imperative
Govender	IG	Doctor of Public Administration	Monitoring and Evaluation Systems Enhancing Corporate Governance in Local Government: A Case Study of KwaZulu-Natal
Madondo	C	Doctor of Business Administration	The Minimisation of the Liquidation of Viable Banking Institutions in Zimbabwe's Banking Sector
Mndzebele	NM	Doctor of Philosophy	The Use of Information and Communication Technologies in South African Hotels – a Self-Evaluation by Hotel Managers
Mulambya	AA	Doctor of Philosophy	Assessing Emotional Intelligence as a Critical Factor in Organizational Performance in the Zambian Parastatal Sector
Nhlabathi	ZF	Doctor of Administration	Promoting Intergovernmental Relations through KwaNalanga Games: A Case Study of Selected Municipalities in KwaZulu-Natal
Ntshangase	DM	Doctor of Administration	Managing Diversity in the Transformation of Public Further Education and Training Colleges in KwaZulu-Natal
Oumar	SB	Doctor of Philosophy	An Analysis of Water Resource Management in Cameroon
Pillay	S	Doctor of Administration	Higher Education Mergers and its Implications for Organizational Culture: A Case Study of the University of KwaZulu-Natal
Thabethe	PD	Doctor of Administration	An Evaluation of Water and Sanitation Provision by Uthukela Water in Selected Districts of KwaZulu-Natal
Van Niekerk	B	Doctor of Philosophy	Vulnerability Analysis of Modern ICT Infrastructure from an Information Warfare Perspective
Vermaak	CL	Doctor of Philosophy	The Working Poor in South Africa 2000-2007

RESEARCH GRANTS AND CONTRACTS 2011

College of Agriculture, Engineering and Science			
Principal Investigator	Project Title	Funder	Amount Awarded
Mudhara, Maxwell	Enhanced capacity and practice of smallholder farmers in sustainable agriculture and natural resource use that result in improved food security and livelihoods – 'Budget 2011-2013'	Foundation ICCO Interchurch Organisation for Development Co-operation	R8 260 008
Schulze, Roland Edgar	Applications of rainfall forecasts for agriculturally related decision making in selected catchment	Water Research Commission	R5 700 000
Jarmain, Caren	An operational service to improve crop water and nitrogen management in grapes and other deciduous fruit trees using satellite technology for the season of 2011-12	Department of Agriculture – Western Cape	R4 044 600
Jarmain, Caren	Water Use Efficiency or Irrigated Agricultural Crops Determined with Satellite Imagery	Water Research Commission	R4 000 000
Buckley, Christopher Andrew	Data and Design: Mineralisation of Sanitation Wastes from Community Ablution Blocks	Bill & Melinda Gates Foundation	R2 728 000
Everson, Colin	The Long Term Impact of Acacia Mearnsii Trees on Evaporation, Streamflow, Low Flows and Ground Water Resources. Phase II: Understanding the Controlling Environmental Variables and Soil Water Processes over a Full Crop Rotation (N/S)	Water Research Commission	R2 295 872
Smithers, Jeffrey Colin	Deployment, Maintenance and Further Development of Spatsim-Hydrological Decision Support Framework (HDSF)	Water Research Commission	R2 265 000
Buckley, Christopher Andrew	Promoting Sanitation and Nutrient Recovery Through Urine Separation	EAWAG: Swiss Federal Institute of Aquatic Science and Technology	R2 181 609
Bob, Urmilla	Women's Property Rights: Gender and Land Surveys in Sub-Saharan Africa – Phase 2	International Center for Research on Women	R1 920 198
Moodley, Deshendra	Health Enterprise Architecture Laboratory (HEAL)	International Development Research Centre	R1 809 884
Lorentz, Simon Antony	Surface Water, Groundwater and Vadose Zone Interactions in Selected Pristine Catchments in the Kruger National Park	Water Research Commission	R1 800 000
Derera, John	Development of Unique Maize Source Germplasm for African Ecosystems – Phase II: – Inbreds & Hybrids Development	Alliance for a Green Revolution in Africa	R1 543 788
Olckers, Terence	Establishment, Ecology and Evaluation of Insect Agents Released to Reduce the Invasiveness of Solanum Mauritianum and Leucaena Leucophala in South Africa	The Department of Water Affairs and Forestry	R1 435 350
Lorentz, Simon Antony	An Investigation into Pollution from Onsite Dry Sanitation Systems	Water Research Commission	R1 427 040
Derera, John	Development of Maize Hybrids with Enhanced Adaptation Ability in Western South Africa: A Challenge Program	Seed Co Ltd	R1 360 582
Coetzer, Theresa	Production of Antigens and Development of an Antibody Detection Test for the Diagnosis of African Animal Trypanosomosis (nagana)	Global Alliance for Livestock Veterinary Medicines	R1 272 092
Slotow, Robert Hugh	Establishment of the UKZN/CSIR Meraka Centre for Artificial Intelligence	Council for Scientific and Industrial Research	R1 100 000
Senzanje, Aidan	Small-scale Water Infrastructure (SWI) in the Limpopo Basin	Agricultural Research Council	R1 094 300
Buckley, Christopher Andrew	Evaluation of the Dewats Process for Decentralised Wastewater Treatment	Water Research Commission	R900 000

RESEARCH GRANTS AND CONTRACTS 2011

1 JANUARY 2011 TO 31 DECEMBER 2011

College of Agriculture, Engineering and Science			
Principal Investigator	Project Title	Funder	Amount Awarded
Jewitt, Graham Paul Wyndham	Spatial Earth Observation Monitoring for Planning and Water Allocation in the International Incomati Basin – (WATPLAN)	European Commission	R847 680
Olckers, Terence	Fireweed Control Research: Research into the Biological Control of Senecio Madagascariensis a Native of South Africa that is an Invasive Weed in Australia	Commonwealth Scientific and Industrial Research Organisation	R773 030
Everson, Colin	Validation of the Forcing Variables (Evaporation and Soil Moisture) in Hydrometeorological Mode	Water Research Commission	R700 000
Stretch, Derek Dewey	Sustainability Solutions of the isiMangaliso/St Lucia Estuarine Lake System	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Mudhara, Maxwell	Promoting well-being among HIV/AIDS affected rural households in Msinga, KwaZulu-Natal South Africa 2011	Hilfswerk der Evangelischen Kirchen Schweiz	R629 600
Schulze, Roland Edgar	Adaptive Interventions in Agriculture to Reduce Vulnerability of Different Farming Systems to Climate Change in South Africa	University of Cape Town	R592 400
Munro, Orde Quentin	MUNRO MINTEK RESEARCH ORDER 11 – Santham Govender, Roseanne C. Salmond, Kate Gillham, Colin R. Wilson, Malcolm Bartlett, Justine De Ponte	Mintek	R481 850
Friedrich, Holger Bernhard	Friedrich HB – Long Chain (chain (C6) paraffin activation, more specifically the catalytic conversion of octane to olefins, aromatics or any other useful products that could be selectively produced	SASOL Technology (Pty) Ltd	R455 000
Fincham, Robert John	Estuaries and Economic Empowerment	Water Research Commission	R387 500
Mudhara, Maxwell	Farmer Access to Innovation Resources – FAIR 2	ETC Foundation	R360 000
Buckley, Christopher Andrew	Evaluation of Forward Osmosis Technology for the Treatment of Concentrated Brines	Water Research Commission	R345 000
Buckley, Christopher Andrew	Natural Resource Optimization for Pulp and Paper	Paper Manufacturers Association of South Africa	R270 000
Lin, Johnson	Detection of Human Pathogenic Viruses in the Umgeni River of Durban, South Africa	Water Research Commission	R200 000
Rigby, Bruce Spencer	RTDS Studies for the System Planning	Eskom	R180 000
Kirkman, Kevin Peter	Convergence and Contingencies in Savanna Grasslands	Colorado State University	R173 259
Hill, Trevor Raymond	Linking Land Use to Water Quality for Effective Water Resource and Ecosystem Management	Council for Scientific and Industrial Research	R171 570
Mudhara, Maxwell	Enhancing Food Security and sustainable Livelihoods Amongst Rural Communities in Msinga, KwaZulu-Natal	DKA Austria	R168 282
Slotow, Robert Hugh	Joint Research Programme in the Area of Biodiversity Conservation and Management in the Face of Global Change	eThekweni Municipality	R160 000
Chitja, Joyce Magoshi	Empowerment of women through water use security, land use security and knowledge generation for improved household food security and sustainable rural livelihoods in selected areas of amongst others Limpopo Province	Water Research Commission	R156 150
Kruger, Hendrik Gerhardus	Synthesis and Testing of Cage-TB Drugs (Including MDR and XDR TB)	Medical Research Council	R150 000
Goldring, James Philip Dean	New Targets for the Rapid Diagnosis of Malaria	Medical Research Council	R150 000
Niesler, Carola Ulrike	Development of a 3-dimensional Skeletal Muscle Wound Healing Assay	Medical Research Council	R140 000
Bytebier, Benny	Digitization of the Invasive Alien and Problem Plant Collection of the Bews Herbarium, UKZN	The South African National Biodiversity Institute	R120 000

College of Agriculture, Engineering and Science			
Principal Investigator	Project Title	Funder	Amount Awarded
Olaniran, Ademola Olufolahan	Invasive Bacterial and Viral Pathogens in Surface Water Resources in KwaZulu-Natal: Impact of Final Effluents from Wastewater Treatment Plants and Health Implications on Domestic Users of the Water	Medical Research Council	R119 000
Bytebier, Benny	Virtual Herbarium and Database of Invasive Alien Species and Problem Plants in KwaZulu-Natal	The South African National Biodiversity Institute	R100 000
Schulze, Roland Edgar	Delineating Quinary Catchments for South Africa and Modelling their Associated Hydrology	Council for Scientific and Industrial Research	R96 000
Mudhara, Maxwell	Improving Food Security through Identification, Strengthening and Upscaling Locally Developed Sustainable Innovations	Oxfam Australia	R76 851
Ramjugernath, Deresh	To Establish a Pilot-Plant Facility at the Institution for Catalytic Distillation Studies	SASOL Technology (Pty) Ltd	R65 000
Chitja, Joyce Magoshi	Need Assessment for the Small Holder Farmers and Mechanism for Technology Transfer	Agricultural Research Council	R65 000
Hill, Trevor Raymond	Influence of unpaved access roads on surface runoff, sediment loss and soil water movement within forest plantations	AquaGreen Consulting	R60 000
Jewitt, Graham Paul Wyndham	Reducing Uncertainties of Evapotranspiration and Preferential Flow in the Estimation of Groundwater Recharge – (WRC Project -K5/1909	Council for Scientific and Industrial Research	R48 000
Van Heerden, Fanie Retief	The Design and Synthesis of a Novel Series of Compounds as Potential Inhibitors of HIV-1 Integrase – Year 1	Mintek	R41 520
Van Heerden, Fanie Retief	The Design and Synthesis of a Novel Series of Compounds as Potential Inhibitors of HIV-1 Integrase – Year 2 (2011)	Mintek	R41 520
Lagrange, Louis Francois	Development of a small-scale geranium harvester	KwaZulu-Natal Department of Agriculture and Environmental Affairs	R40 000
Everson, Theresa Mary	Africa at Meso-scale: Adaptive and Integrated Tools and Strategies on Natural Resources Management – (AFROMAISON)	European Commission	R38 100
Maharaj, Aneshkumar	Global Expansion of SciEthics Interactive through the HP Catalyst	West Chester University of Pennsylvania	R31 064
Ramjugernath, Deresh	To Measure and Report Infinite Coefficients for the Solvents and Solutes at Specified Temperatures	Sasol Technology (Pty) Ltd	R27 000
Total			R56 266 699
College of Health Sciences			
Principal Investigator	Project Title	Funder	Amount Awarded
Abdool Karim, Salim Safurdeen	CAPRISA HIV/AIDS Clinical Trials Unit – Supplement funding for MTN and IMPAACT Networks	National Institutes of Health	R32 031 278
Newell, Marie-Louise	A Cluster Randomized Trial Comparing the Impact of Immediate Versus WHO Recommendations Guided ART Initiation on HIV Incidence. The TasP (Treatment as Prevention) Trial in Hlabisa sub-district, KwaZulu-Natal, South Africa	French National Agency for Research on AIDS and Viral Hepatitis	R27 255 879
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 15	PACT SA	R14 181 970
Abdool Karim, Salim Safurdeen	CAPRISA 004 – Phase IIb Trial to Assess the Safety and Effectiveness of the Vaginal Microbicide 1% Tenofovir Gel for the Prevention of HIV Infection in Women in South Africa	Family Health International	R12 544 721
Abdool Karim, Salim Safurdeen	CAPRISA 004 – Phase IIb Trial to Assess the Safety and Effectiveness of the Vaginal Microbicide 1% Tenofovir Gel for the Prevention of HIV Infection in Women in South Africa	Family Health International	R12 494 721

RESEARCH GRANTS AND CONTRACTS 2011

1 JANUARY 2011 TO 31 DECEMBER 2011

College of Health Sciences			
Principal Investigator	Project Title	Funder	Amount Awarded
Newell, Marie-Louise	Sub-funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa	PACT South Africa	R9 930 398
Naicker, Thajasvarie	The Role of Leptin In HIV Associated Preeclampsia	Medical Research Council	R9 930 398
Newell, Marie-Louise	Sub-funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 11	PACT South Africa	R9 792 476
Ndung'u, Peter Thumbi	Impact of HLA class I alleles on immune control of adult and paediatric HIV infection	University of Oxford	R8 754 957
Ndung'u, Peter Thumbi	The International Early Start Career Scientist Grant	Howard Hughes Medical Institute	R5 712 850
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 13	PACT South Africa	R5 348 300
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 12	PACT South Africa	R4 703 140
Ndung'u, Peter Thumbi	Pathogenesis of Clade C HIV Infection	Massachusetts General Hospital	R3 483 707
Moodley, Indhrasen	Implementation of the Moringa National Research Project as part of the Indigenous Knowledge Systems Technology Transfer Initiative	Department of Science and Technology	R3 035 500
Padayatchi, Nesri	An International Observational Study to: 1) Characterize Adults with Influenza, also known as 'Influenza Outpatient Study' or 'FLU 002'. 2) Characterize Adults Who Are Hospitalized with Complications of Influenza – also known as 'Influenza Hospitalization Study' or 'FLU 003' – (Task Order 4)	Institute for Clinical Research Inc	R2 941 882
Ndung'u, Peter Thumbi	Impact of HLA class I alleles on immune control of adult and paediatric HIV infection	University of Oxford	R2 777 783
Ndung'u, Peter Thumbi	Pathogenesis of Clade C HIV Infection – Under NIH Prime Award No: 2R37AI067073-06A1	Massachusetts General Hospital	R2 284 348
Moodley, Indhrasen	Cosmeceuticals Concepts and Product Development	University of Pretoria	R1 647 547
Padayatchi, Nesri	Columbia University-Southern African AIDS International/ Research Program	Columbia University	R1 488 198
Newell, Marie-Louise	Pathfinders Project: Assessing the Impact of Internal Labour Migration on Intergenerational Support, Health and Income: The Cases of China and South Africa	University of Southampton	R1 480 359
Naidoo, Nithiseelan Rajen	EO2HEAVEN – Earth Observation and Environmental modelling for the mitigation of Health risks	European Commission	R1 463 860
Ndung'u, Peter Thumbi	HIV Controllers: Implications for Immunogen Design – Year 5	Massachusetts General Hospital	R1 450 662
Ndung'u, Peter Thumbi	Establishment and long-term follow-up of a cohort of young mothers identified from PMMH antenatal clinic	Massachusetts General Hospital	R1 399 262
Ndung'u, Peter Thumbi	HIV Controllers: Implications for Immunogen Design – Year 4	Massachusetts General Hospital	R1 241 804
Newell, Marie-Louise	Supplement to the 2007-2012 Core Funding for the Africa Centre Health and Population Studies to support the appointment of a Chief Operating Officer	The Wellcome Trust	R1 143 850
Padayatchi, Nesri	Columbia University-Southern African AIDS International/ Research Program	Columbia University	R957 045
Ndung'u, Peter Thumbi	International Maternal Pediatric Adolescent AIDS Clinical Trials Group (IMPAACT) Task Order – Year 6 (1 June 2011-31 May 2012)	Social & Scientific Systems Inc	R894 020
Ndung'u, Peter Thumbi	Innate Immunity in HIV-1 infection	Massachusetts General Hospital	R893 225

College of Health Sciences			
Principal Investigator	Project Title	Funder	Amount Awarded
Newell, Marie-Louise	Supplement to the 2007-2012 Core Funding for the Africa Centre Health and Population Studies to support the Renovation of the Ilala Buildings	The Wellcome Trust	R800 506
Gqaleni, Nceba	Establishment of a Principle IKS Documentation Centre at the University of KwaZulu-Natal	Department of Science and Technology	R800 000
Abdool Karim, Salim Safurdeen	University of KwaZulu-Natal-Caprisa HIV/AIDS Clinical Trials Unit	National Institutes of Health	R621 738
Ndung'u, Peter Thumbi	Fogarty International Clinical Research Scholars Support Center @ Vanderbilt -AAMC	Vanderbilt University	R505 206
Burns, Jonathan Kenneth	Brain Disorders in the Developing World: Research Across the Lifespan (R21)	Columbia University	R446 040
Ndung'u, Peter Thumbi	International Maternal Pediatric Adolescent AIDS Clinical Trials Group '(IMPACT)'	Social & Scientific Systems Inc	R442 427
Newell, Marie-Louise	Geographic Mobility in a Rural Population in Kwa Zulu-Natal, South Africa; Implications for Continuity of Primary Health Care	Benguela Health (Pty) Ltd	R426 116
Ndung'u, Peter Thumbi	NK Cell Function in HIV-1 Infection	Massachusetts General Hospital	R328 320
Kauchali, Shuaib	Health and Psychosocial Need: Children with Developmental Disorder in a Time of HIV	Columbia University	R313 676
Owira, Peter Mark Oroma	Pharmacological Profiling of the Grapefruit in the Treatment of Diabetes and Cardiovascular Disorders	Medical Research Council	R250 000
Kauchali, Shuaib	Early Social Communication Characteristics of Autism Spectrum Disorders (ASD) in Diverse Cultures in the United States and Africa – Year 2	Florida State University	R241 034
Padayatchi, Nesri	Fogarty International Clinical Research Scholars – Andrew Tomita (Fellow)	Columbia University	R204 950
Kauchali, Shuaib	Early Social Communication Characteristics of Autism Spectrum Disorders (ASD) in Diverse Cultures in the United States and Africa	Florida State University	R204 937
Moodley, Indhrasen	Cosmeceuticals Concepts and Product Development	University of Pretoria	R200 000
Gqaleni, Nceba	The Use of Metal Salts in South African Traditional Medicine	Medical Research Council	R200 000
Newell, Marie-Louise	Additional Funding for UNITAS Project	Department of Science and Technology	R182 252
Ndung'u, Peter Thumbi	Innate Immune Mechanisms in the Prevention of HIV-1 Transmission: The Role of Natural Killer Cells in HIV-1 Pathogenesis	Massachusetts General Hospital	R151 654
Pillay, Manormoney	M. tuberculosis Pill in the Development of a Point of Care Diagnostic Test and their Role in RB Pathogenesis	Medical Research Council	R150 000
Ndung'u, Peter Thumbi	AIDS-Restrictive Innate Immune Mechanisms	Massachusetts General Hospital	R147 875
Newell, Marie-Louise	Impact of Antiretroviral Therapy on HIV Epidemic Dynamics	Brown University	R126 066
Ndung'u, Peter Thumbi	Innate Host Genetic Determinants that Restrict Mother to Child HIV-1 Clade C Transmission	Massachusetts General Hospital	R125 582
Gqaleni, Nceba	The Use of Metal Salts in South African Traditional Medicine	Medical Research Council	R98 229
Brysiewicz, Petra	The Incidence of Traumatic Brain Injuries (TBI) in KwaZulu-Natal (KZN): A Pilot Study	Medical Research Council	R93 500
Newell, Marie-Louise	Strengthening the Evidence Base for the Epidemiology of Maternal, Neonatal and Child Conditions	UNICEF	R89 761
Bhigjee, Ahmed Iqbal	A Qualitative and Quantitative Magnetic Resonance Diffusion Study Investigating the Pathogenesis of Cryptococcal Induced Vision Loss	Medical Research Council	R65 000

RESEARCH GRANTS AND CONTRACTS 2011

1 JANUARY 2011 TO 31 DECEMBER 2011

College of Health Sciences			
Principal Investigator	Project Title	Funder	Amount Awarded
Frohlich, Janet Ann	HIV Prevention Trials Network (HPTN) Leadership Group – Year 6	Family Health International	R50 790
Frohlich, Janet Ann	Sciobelelana Ngolwazi: Sharing Knowledge and Building Capacity amongst Health Care Workers on Gender, HIV and AIDS	The Human Sciences Research Council	R35 000
Biccard, Bruce McClure	PeriOperative ISchemic Evaluation-2 (POISE-2)	Hamilton Health Sciences Corporation	R1 577
Total			R188 566 376
College of Humanities			
Principal Investigator	Project Title	Funder	Amount Awarded
Wedekind, Volker Ralf	Project on FET Colleges and the Implementation of the National Curriculum (Vocational)	South African Qualifications Authority	R1 460 000
Bond, Patrick Martin	Environmental Justice Organizations, Liabilities and Trade – (EJOLT)	European Commission	R1 404 055
Mudaly, Vimolan	Enhancing Secondary Mathematics Teacher Education: Collaborative partnership with SUNY-Buffalo	State University of New York	R1 155 400
May, Julian Douglas	Analysis of the Living Conditions Survey 2008/2009	Statistics South Africa	R1 153 680
Zulu, Paulus Mzomuhle	Programme Sukuma Sakhe – (Flagship Programme)	KZN Premier's Office	R1 082 400
Bhengu, Sthembiso Musawenkos	Sisonke District Municipality Customer Satisfaction Survey and Service Delivery Audit	Sisonke District Municipality	R992 000
Khumalo, Vukile	The ANC Centenary 1912-2012 – Moments of Outstanding Heroism in the KZN that Contributed to the Achievement of Freedom in South Africa	African National Congress	R725 000
Vahed, Goolam Hoosen Mohamed	Identity, Belonging and Place in South Africa: A Case Study of Chatsworth, KZN	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Nadvi, Syeda Lubna Bano	Managing and responding to Gender based Violence in South Africa through Education, Training and Research: Synergies between Practitioners and Higher Education Institutions	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Denis, Philippe Marie Berth	An oral History of HIV/AIDS in KwaZulu-Natal. Life stories of pastoral agents, NGO workers and caregivers involved in the fight against the epidemic	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Wassenaar, Douglas Richard	Strengthening African Research Ethics Committees' Capacity for Ethical Review of HIV Prevention Research	European and Developing Countries Clinical Trials Partnership	R639 162
May, Julian Douglas	Strengthening Information Society Research Capacity Alliance in Africa Region (SIRCA II) 2011-2013	Nanyang Technological University	R531 369
Valodia, Imraan Abdul Kader	Women in Informal Employment Globalizing and Organizing (WIEGO) Informal Economy Monitoring Study	Women in Informal Employment Globalizing and Organizing	R305 613
Wassenaar, Douglas Richard	Assessing Voluntariness of Consent to Research in South Africa HIV Prevention and Treatment Trials	The Wellcome Trust	R280 114
Lindegger, Graham Charles	Strengthening the Ethical-Legal Framework for South African HIV Vaccine Trials (HVTs)	Medical Research Council	R274 500
Maré, Paul Gerhardus	Development of an Advocacy Strategy for the City of Durban, South Africa. Enabling Education Systems, Teachers, Media Professionals and Local Leaders to Support Comprehensive Responses to HIV Prevention, Treatment, Care and Support	United Nations Education, Science and Cultural Organization	R115 500
Moletsane, Relebohile	Assistance to the National Planning Commission (NPC) for the two studies: 1) To Conduct an Audit of Schools Curriculum and 2) Constitution of 1996 Suggest Options for implementing a Curriculum based Approach to Inculcating and Teaching Values as Embedded in the RSA Values it Inculcates	National Planning Commission Secretariat	R96 870

College of Humanities			
Principal Investigator	Project Title	Funder	Amount Awarded
Maharaj, Pranitha	Health in a 'Changing' South Africa	Medical Research Council	R80 000
May, Julian Douglas	Exploring Use of Mobile Banking Services by the Poor: Case of Wizzit Bank in South Africa	Regents of the University of California	R55 940
Denis, Philippe Marie Berth	National Implementation of Training in Resiliency-Building for Caregivers of Orphans and Vulnerable Children in South Africa	Children's Emergency Relief International	R46 540
Total			R12 402 143
College of Law and Management Studies			
Principal Investigator	Project Title	Funder	Amount Awarded
Quinlan, Timothy	Facilitating Alternative Gender Constructs in Home-Based Care and Child Welfare Programmes in South Africa	Embassy of Ireland	R744 975
Kohler, Marcel Rene Anton Robert	The Impact of Trade on Changing Patterns of Energy Use in South African Manufacturing	South African National Energy Research Institute	R250 000
Whiteside, Alan Walter	Mobility of Health Professionals from Selected African Countries of the European Union (MoHProf Project)	International Organization for Migration	R200 466
Total			R1 195 441
Research Office			
Principal Investigator	Project Title	Funder	Amount Awarded
Ijumba, Nelson Mutatina	Developing a Strategy for a Green Economy in KZN Province	KZN Department of Economic Development & Tourism	R3 000 000
Total			R3 000 000
Grand Total			R261 430 659

College	Amount
Agriculture, Engineering and Science	R56 266 699
Health Sciences	R188 566 376
Humanities	R12 402 143
Law and Management Studies	R1 195 441
Research Office	R3 000 000
Total	R261 430 659

RESEARCH GRANTS EXCEEDING R500 000 FROM FUNDERS IN 2011

College of Agriculture, Engineering and Science			
Principal Investigator	Project Title	Funder	Amount Awarded
Mudhara, Maxwell	Enhanced capacity and practice of smallholder farmers in sustainable agriculture and natural resource use that result in improved food security and livelihoods – 'Budget 2011-2013'	Foundation ICCO Interchurch Organisation for Development Co-operation	R8 260 008
Schulze, Roland Edgar	Applications of rainfall forecasts for agriculturally related decision making in selected catchment	Water Research Commission	R5 700 000
Diana, Gregory	Commercial Energy Management and Energy Efficiency	Technology and Human Resources for Industry Programme	R5 600 000
Jarmain, Caren	An operational service to improve crop water and nitrogen management in grapes and other deciduous fruit trees using satellite technology for the season of 2011-12	Department of Agriculture – Western Cape	R4 044 600
Jarmain, Caren	Water Use Efficiency or Irrigated Agricultural Crops Determined with Satellite Imagery	Water Research Commission	R4 000 000
Buckley, Christopher Andrew	Data and Design: Mineralization of Sanitation Wastes from Community Ablution Blocks	Bill & Melinda Gates Foundation	R2 728 000
Everson, Colin	The Long Term Impact of <i>Acacia Mearnsii</i> Trees on Evaporation, Streamflow, Low Flows and Ground Water Resources. Phase II: Understanding the Controlling Environmental Variables and Soil Water Processes over a Full Crop Rotation (N/S)	Water Research Commission	R2 295 872
Smithers, Jeffrey Colin	Deployment, Maintenance and Further Development of Spatsim-Hydrological Decision Support Framework (HDSF)	Water Research Commission	R2 265 000
Buckley, Christopher Andrew	Promoting Sanitation and Nutrient Recovery Through Urine Separation	EAWAG: Swiss Federal Institute of Aquatic Science and Technology	R2 181 609
Pillay, Balakrishna	Production of AE-IFG1	Technology and Human Resources for Industry Programme	R2 103 500
Bob, Urmilla	Women's Property Rights: Gender and Land Surveys in Sub-Saharan Africa – Phase 2	International Center for Research on Women	R1 920 198
Moodley, Deshendra	Health Enterprise Architecture Laboratory (HEAL)	International Development Research Centre	R1 809 884
Lorentz, Simon Antony	Surface Water, Groundwater and Vadose Zone Interactions in Selected Pristine Catchments in the Kruger National Park	Water Research Commission	R1 800 000
Derera, John	Development of Unique Maize Source Germplasm for African Ecosystems – Phase II: – Inbreds & Hybrids Development	Alliance for a Green Revolution in Africa	R1 543 788
Olckers, Terence	Establishment, Ecology and Evaluation of Insect Agents Released to Reduce the Invasiveness of <i>Solanum Mauritanum</i> and <i>Leucaena Leucocphala</i> in South Africa	The Department of Water Affairs and Forestry	R1 435 350
Lorentz, Simon Antony	An Investigation into Pollution from Onsite Dry Sanitation Systems	Water Research Commission	R1 427 040
Derera, John	Development of Maize Hybrids with Enhanced Adaptation Ability in Western South Africa: A Challenge Program	Seed Co Ltd	R1 360 582
Coetzer, Theresa Helen Taille	Production of Antigens and Development of an Antibody Detection Test for the Diagnosis of African Animal Trypanosomosis (nagana)	Global Alliance for Livestock Veterinary Medicines	R1 272 092
Ijumba, Nelson Mutatina	Centre for Engineering Postgraduate Studies	Technology and Human Resources for Industry Programme	R1 196 250
Trois, Christina	Integrated Biogas Development Project	Technology and Human Resources for Industry Programme	R1 125 000

College of Agriculture, Engineering and Science			
Principal Investigator	Project Title	Funder	Amount Awarded
Slotow, Robert Hugh	Establishment of the UKZN/CSIR Meraka Centre for Artificial Intelligence	Council for Scientific and Industrial Research	R1 100 000
Senzanje, Aidan	Small-scale Water Infrastructure (SWI) in the Limpopo Basin	Agricultural Research Council	R1 094 300
Buckley, Christopher Andrew	Evaluation of the Dewats Process for Decentralised Wastewater Treatment	Water Research Commission	R900 000
Jewitt, Graham Paul Wyndham	Spatial Earth Observation Monitoring for Planning and Water Allocation in the International Incomati Basin – (WATPLAN)	European Commission	R847 680
Olckers, Terence	Fireweed Control Research: Research into the Biological Control of Senecio Madagascariensis a Native of South Africa that is an Invasive Weed in Australia	Commonwealth Scientific and Industrial Research Organisation	R773 030
Everson, Colin	Validation of the Forcing Variables (Evaporation and Soil Moisture) in Hydrometeorological Mode	Water Research Commission	R700 000
Stretch, Derek Dewey	Sustainability Solutions of the isiMangaliso/St. Lucia Estuarine Lake System	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Mudhara, Maxwell	Promoting well-being among HIV/AIDS affected rural households in Msinga, KwaZulu-Natal South Africa 2011	Hilfswerk der Evangelischen Kirchen Schweiz	R629 600
Schulze, Roland Edgar	Adaptive Interventions in Agriculture to Reduce Vulnerability of Different Farming Systems to Climate Change in South Africa	University of Cape Town	R592 400
Kruger, Hendrik Gerhardus	Radiolabelled peptide imaging	Technology and Human Resources for Industry Programme	R532 000
Total			R61 905 783
College of Health Sciences			
Principal Investigator	Project Title	Funder	Amount Awarded
Abdool Karim, Salim Safurdeen	CAPRISA HIV/AIDS Clinical Trials Unit – Supplement funding for MTN and IMPAACT Networks	National Institutes of Health	R32 031 278
Newell, Marie-Louise	A Cluster Randomized Trial Comparing the Impact of Immediate Versus WHO Recommendations Guided ART Initiation on HIV Incidence. The TasP (Treatment as Prevention) Trial in Hlabisa sub-district, KwaZulu-Natal, South Africa	French National Agency for Research on AIDS and Viral Hepatitis	R27 255 879
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 15	PACT SA	R14 181 970
Abdool Karim, Salim Safurdeen	CAPRISA 004 – Phase IIb Trial to Assess the Safety and Effectiveness of the Vaginal Microbicide 1% Tenofovir Gel for the Prevention of HIV Infection in Women in South Africa	Family Health International	R12 544 721
Abdool Karim, Salim Safurdeen	CAPRISA 004 – Phase IIb Trial to Assess the Safety and Effectiveness of the Vaginal Microbicide 1% Tenofovir Gel for the Prevention of HIV Infection in Women in South Africa	Family Health International	R12 494 721
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa	PACT South Africa	R9 930 398
Naicker, Thajasvarie	The Role of Leptin In HIV Associated Preeclampsia	Medical Research Council	R9 930 398
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 11	PACT South Africa	R9 792 476
Ndung'u, Peter Thumbi	Impact of HLA class I alleles on immune control of adult and paediatric HIV infection	University of Oxford	R8 754 957
Ndung'u, Peter Thumbi	The International Early Start Career Scientist Grant	Howard Hughes Medical Institute	R5 712 850

RESEARCH GRANTS EXCEEDING R500 000 FROM FUNDERS IN 2011

College of Health Sciences			
Principal Investigator	Project Title	Funder	Amount Awarded
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa – Modification 13	PACT South Africa	R5 348 300
Newell, Marie-Louise	Sub-Funding provided by PACT, Inc to Africa Centre to implement its HIV/AIDS program in South Africa - Modification 12	PACT South Africa	R4 703 140
Ndung'u, Peter Thumbi	Pathogenesis of Clade C HIV Infection	Massachusetts General Hospital	R3 483 707
Moodley, Indhrasen	Implementation of the Moringa National Research Project as part of the Indigenous Knowledge Systems Technology Transfer Initiative	Department of Science and Technology	R3 035 500
Padayatchi, Nesri	An International Observational Study to: 1) Characterize Adults with Influenza, also known as 'Influenza Outpatient Study' or 'FLU 002'. 2) Characterize Adults Who Are Hospitalized with Complications of Influenza – also known as 'Influenza Hospitalization Study' or 'FLU 003' – (Task Order 4)	Institute for Clinical Research Inc	R2 941 882
Ndung'u, Peter Thumbi	Impact of HLA class I alleles on immune control of adult and paediatric HIV infection	University of Oxford	R2 777 783
Ndung'u, Peter Thumbi	Pathogenesis of Clade C HIV Infection – Under NIH Prime Award No: 2R37AI067073-06A1	Massachusetts General Hospital	R2 284 348
Moodley, Indhrasen	Cosmeceuticals Concepts and Product Development	University of Pretoria	R1 647 547
Padayatchi, Nesri	Columbia University-Southern African AIDS International/ Research Program	Columbia University	R1 488 198
Newell, Marie-Louise	Pathfinders Project: Assessing the Impact of Internal Labour Migration on Intergenerational Support, Health and Income: The Cases of China and South Africa	University of Southampton	R1 480 359
Naidoo, Nithiseelan Rajen	EO2HEAVEN – Earth Observation and Environmental modelling for the mitigation of Health risks	European Commission	R1 463 860
Ndung'u, Peter Thumbi	HIV Controllers: Implications for Immunogen Design – Year 5	Massachusetts General Hospital	R1 450 662
Ndung'u, Peter Thumbi	Establishment and long-term follow-up of a cohort of young mothers identified from PMMH antenatal clinic	Massachusetts General Hospital	R1 399 262
Ndung'u, Peter Thumbi	HIV Controllers: Implications for Immunogen Design – Year 4	Massachusetts General Hospital	R1 241 804
Newell, Marie-Louise	Supplement to the 2007-2012 Core Funding for the Africa Centre Health and Population Studies to support the appointment of a Chief Operating Officer	The Wellcome Trust	R1 143 850
Padayatchi, Nesri	Columbia University-Southern African AIDS International/ Research Program	Columbia University	R957 046
Ndung'u, Peter Thumbi	International Maternal Pediatric Adolescent AIDS Clinical Trials Group (IMPAACT) Task Order – Year 6 (1 June 2011 – 31 May 2012)	Social & Scientific Systems Inc	R894 020
Ndung'u, Peter Thumbi	Innate Immunity in HIV-1 infection	Massachusetts General Hospital	R893 225
Newell, Marie-Louise	Supplement to the 2007-2012 Core Funding for the Africa Centre Health and Population Studies to support the Renovation of the Ilala Buildings	The Wellcome Trust	R800 506
Gqaleni, Nceba	Establishment of a Principle IKS Documentation Centre at the University of KwaZulu-Natal	Department of Science and Technology	R800 000
Abdool Karim, Salim Safurdeen	University of KwaZulu-Natal-Caprisa HIV/AIDS Clinical Trials Unit	National Institutes of Health	R621 738
Ndung'u, Peter Thumbi	Fogarty International Clinical Research Scholars Support Center @ Vanderbilt-AAMC	Vanderbilt University	R505 206
Total			R182 344 044

College of Humanities			
Principal Investigator	Project Title	Funder	Amount Awarded
Wedekind, Volker Ralf	Project on FET Colleges and the Implementation of the National Curriculum (Vocational)	South African Qualifications Authority	R1 460 000
Bond, Patrick Martin	Environmental Justice Organizations, Liabilities and Trade – (EJOLT)	European Commission	R1 404 055
Mudaly, Vimolan	Enhancing Secondary Mathematics Teacher Education: Collaborative partnership with SUNY-Buffalo	State University of New York	R1 155 400
May, Julian Douglas	Analysis of the Living Conditions Survey 2008/2009	Statistics South Africa	R1 153 680
Zulu, Paulus Mzomuhle	Programme Sukuma Sakhe – (Flagship Programme)	KZN Premier's Office	R1 082 400
Bhengu, Sthembiso Musawenkos	Sisonke District Municipality Customer Satisfaction Survey and Service Delivery Audit	Sisonke District Municipality	R992 000
Khumalo, Vukile	The ANC Centenary 1912-2012 – Moments of Outstanding Heroism in the KZN that Contributed to the Achievement of Freedom in South Africa	African National Congress	R725 000
Vahed, Goolam Hoosen Mohame	Identity, Belonging and Place in South Africa: A Case Study of Chatsworth, KZN	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Nadvi, Syeda Lubna Bano	Managing and responding to Gender based Violence in South Africa through Education, Training and Research: Synergies between Practitioners and Higher Education Institutions	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Denis, Philippe Marie Berth	An oral History of HIV/AIDS in KwaZulu-Natal. Life stories of pastoral agents, NGO workers and caregivers involved in the fight against the epidemic	South Africa-Netherlands Research Programme on Alternatives in Development	R668 000
Wassenaar, Douglas Richard	Strengthening African Research Ethics Committees' Capacity for Ethical Review of HIV Prevention Research	European and Developing Countries Clinical Trials Partnership	R639 162
May, Julian Douglas	Strengthening Information Society Research Capacity Alliance in Africa Region (SIRCA II) 2011-2013	Nanyang Technological University	R531 369
Total			R6 499 217
College of Law and Management Studies			
Principal Investigator	Project Title	Funder	Amount Awarded
Quinlan, Timothy	Facilitating Alternative Gender Constructs in Home-Based Care and Child Welfare Programmes in South Africa	Embassy of Ireland	R744 975
Total			R744 975
Research Office			
Principal Investigator	Project Title	Funder	Amount Awarded
Ijumba, Nelson Mutatina	Developing a Strategy for a Green Economy in KZN Province	KZN Department of Economic Development & Tourism	R3 000 000
Total			R3 000 000
Grand Total			R254 494 019

College	Amount
Agriculture, Engineering and Science	R61 905 783
Health Sciences	R182 344 044
Humanities	R6 499 217
Law and Management Studies	R744 975
Research Office	R3 000 000
Total	R254 494 019

STATUTORY INCOME FROM THE NATIONAL RESEARCH FOUNDATION

Statutory Income from the National Research Foundation 2011

COLLEGE	ACEP	AOPPG	CPRR	FOCUS AREA	HCDMA	IPRR	
Agriculture, Engineering and Science	R197 448	R244 480	R1 432 049	R3 266 976	R412 758	R3 699 382	
Humanities			R227 090	R806 794		R2 023 003	
Health Sciences							
Law and Management Studies							
GRAND TOTAL	R197 448	R244 480	R1 659 139	R4 073 770	R412 758	R5 722 385	

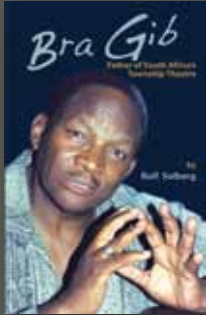


	KFD	IFRR	PDF	RISP	SARCHI	THRIP	THUTHUKA	GRAND TOTAL
	R36 583	R3 168 975	R1 011 350	R7 334 000	R12 441 998	R12 884 803	R2 138 447	R48 269 249
	R619 637	R1 913 759			R5 738 929		R1 385 096	R12 714 308
		R409 847						R409 847
		R229 803						R229 803
	R656 220	R5 722 384	R1 011 350	R7 334 000	R18 180 927	R12 884 803	R3 523 543	R61 623 207

Abbreviations for Statutory Income Table	
ACEP	African Coelacanth Ecosystem Programme
AOPPG	African Origin Programme
CPRR	Competitive Programme for Rated Researchers
HCDMA	Human Capital Development for Multi-Wavelength Astronomy
IFRR	Incentive Funding for Rated Researchers
KFD	Knowledge Fields Development
PDF	Post Doctoral Fellowships
RISP	Research Infrastructure Support Programme
SARCHI	South African Research Chairs Initiative
THRIP	Technology and Human Resources for Industry Programme



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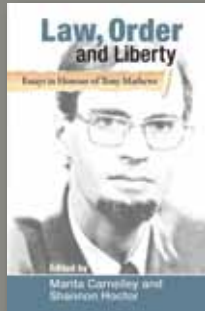
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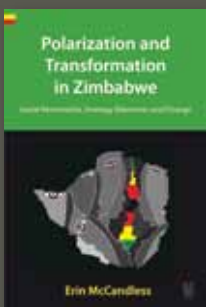
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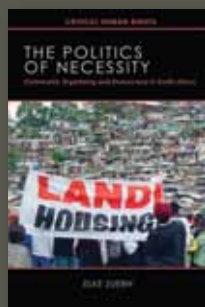
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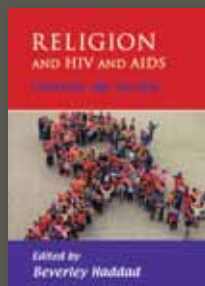


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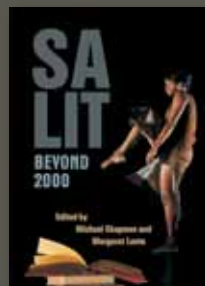


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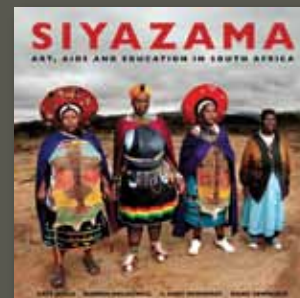
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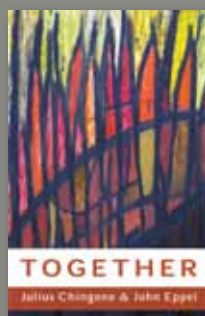
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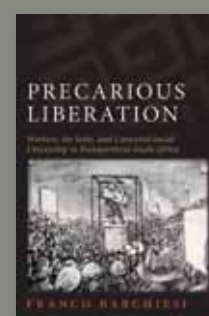
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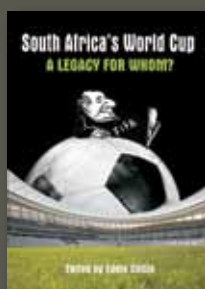
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