

# SQUARED<sup>2</sup> UP

Newsletter of the Faculty of Natural and Agricultural Sciences ■ Issue 1 ■ June 2013



## Diversity contributes to research endeavours in Faculty

The reputation of a University is built upon the quality of its research and education and this is why the vision of the Faculty of Natural and Agricultural Sciences aligns with the University's strategic vision.

Through its research and educational programmes, the Faculty contributes substantially towards the relief of South Africa's human capital development needs. It provides research solutions within critical areas relating to human and animal health, sustainable energy, food and water security, biodiversity and conservation, climate change and economic sustainability.

The Faculty reiterated its commitment to research with the recent acquisition of two SARChI Research Chairs, one in Mathematical Models and Methods in Bioengineering and

Biosciences (chaired by Prof Jean Lubuma) and one in Sustainable Malaria Control (chaired by Prof Lynmarie Birkholtz). The SARChI Chairs are funded by the Department of Science and Technology through the National Research Foundation (NRF).

The UP Water Institute, which is internationally recognised for the quality of its education as well as its research in water, was successful in acquiring one of four Rand Water chair positions. The Chair was awarded to Prof Fanus Venter in the field of Microbiology. Currently the Faculty has increased its amount of researchers with NRF-ratings to 137, constituting about 40% of the rated researchers at the University. Five of these professors are A-rated researchers (Leading International Researcher).

More evidence that the Faculty is one of the most diverse science faculties in South Africa is found in the fact that it is well placed on the rankings of the ISI Web of Knowledge. The rankings measure performance on the volume and impact of research. The Faculty is performing well in a number of research fields of which the fields of Plant- and Animal Sciences, Environment and Ecology as well as Agriculture are listed as such.

The Faculty's research and education programmes range over the broad field of Agricultural and Food Sciences, Biological Sciences, Physical Sciences and Mathematical Sciences. We have strong research networks worldwide and in addition collaborate significantly with the Faculties of Health Sciences, Veterinary

*Continued on page 2*



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA  
Faculty of Natural and Agricultural Sciences



## Message from the Dean

*continued from page 1*

Sciences and Engineering and the Built Environment on various projects relating to animal and human health, energy and material sciences. An example of such collaboration is the launch of the Tshwane Animal Health Cluster where our Faculty, in conjunction with the Faculty of Veterinary Sciences, are key partners with the Technology Innovation Agency to stimulate the development of commercially viable technologies that specifically address the challenges confronting the animal health sector.

# Strengthening research in the Faculty

As one of the most diverse science faculties in South Africa, we want to strengthen our position as a premier research faculty to ensure future success, by making a positive contribution to the relief of local, national and international needs. Through research, as well as teaching and learning endeavours in the Faculty, we aim to make the world a better place.

The Faculty was recently awarded two SARChI Research Chairs, one in Mathematical Models and Methods in Bioengineering and Biosciences, which will further enhance our research effort (read more on page 7). The other one is in Sustainable Malaria Control (read more on page 8). The UP Water Institute was successful in acquiring one of four Rand Water chair positions. One of the Chairs was awarded to Prof Fanus Venter in the field of Microbiology (page 8).

One of the interesting research projects in the Faculty is a Green Chemistry Platform that was established within the IFNuW. The aim is to integrate research and training activities within the broader concept of pesticide

regulatory control (page 13). A question which has gone unanswered for a long time, is the following: which physical attributes arouse a woman's interest in a man? Dr Vinet Coetzee of the Department of Genetics and a team of researchers supplied the answer to this question in a research report that was published in the respected scientific journal *Proceedings of the Royal Society of London, B* (page 15). Also read more on a global research project on how to control stem rust disease and thereby prevent losses of billions of dollars (page 12).

The opening of the new home for the Mammal Research Institute and Mathematics will also expand the University's research and teaching facilities, which form part of the UP's long term strategy (page 21). The Department of Biochemistry was instrumental in the creation of an African green-tea product in a small pilot plant at the Ntingwe Tea Factory in KwaZulu-Natal (page 16).

As always, we are very proud of the outstanding achievements of our staff in the Faculty. The University paid tribute to its academics from various fields of study for their outstanding research endeavours. The Chancellor's Award in research was given to Prof Sue Nicolson of the Department of Zoology and Entomology. Last year's winner, Prof Brenda Wingfield, is also from the Faculty (page 3).

Our students are performing just as well: Renée Hlozek is currently conducting postdoctoral research in cosmology at Princeton University, as a Lyman Spitzer Jr. postdoctoral Fellow in Theoretical Astrophysics. She kicked off her career in Science through the UP with Science Programme after she completed a BSc degree in Mathematics at the Faculty in 2005 (page 24). Henry Thackeray was awarded the Vice-Chancellor and Principal's award as the overall top achiever in the Faculty and received his BSc degree in Mathematics with a weighted average performance of 98,74% over the three years of study (page 25).

There are many more outstanding achievements by our staff, students and affiliates of which we are very proud. With this newsletter we aim to showcase some of these and we hope that you will enjoy this update on the latest developments in our Faculty.

**Prof Anton Ströh**

Dean: Faculty of Natural and Agricultural Sciences

Message from the Dean

## Editor



Martie Meyer

### Editorial Office:

Martie Meyer (Editor)  
martie.meyer@up.ac.za  
012 420 5498 (office)  
012 420 5895 (fax)  
Room 8-9,  
Agricultural Sciences Building  
Faculty of Natural and  
Agricultural Sciences

### Layout:

Rita Dave  
Creative Studios (Hatfield)  
Department for Education Innovation • 012 420 3932

### Language editing:

Melodie Veldhuizen and UP Language Services

Please send your comments on the newsletter or suggestions/ ideas for articles to [martie.meyer@up.ac.za](mailto:martie.meyer@up.ac.za)

# Academics in Natural and Agricultural Sciences shine bright



Chancellor's Award for Research: Prof Sue Nicolson

The University of Pretoria recently paid tribute to its academics from various fields of study for their outstanding research endeavours. Researchers in the Faculty of Natural and Agricultural Sciences performed extremely well and scooped up many of the awards at this year's Academic Achievers Awards held on 24 April 2013.

The awards were presented in three categories: the Chancellor's Award for research category, Exceptional Academic Achievers and Exceptional Young Researchers.

In the first category, the **Chancellor's Award in research** was given to Prof Sue Nicolson of the Department of Zoology and Entomology.

The previous winner, Prof Brenda Wingfield, is also from the Faculty of Natural and Agricultural Sciences.

Prof Nicolson's research focuses on the physiological aspects of pollination biology, by examining pollination from the context of the animals involved, rather than the plants. It includes the nutritional value of nectar and pollen (especially in aloes, *Erythrina* and sunflowers), the feeding behaviour of sunbirds and the extreme osmotic and energetic challenges for birds drinking dilute nectars. Research carried out by her group on sunbirds and their nectar diets has contributed an African perspective on the relationship between birds and flowers.

She has published 140 papers in peer-reviewed zoological and physiological journals, largely in association with postgraduate students and postdoctoral fellows, and has also published two books. The first book, titled *Insect physiological ecology: mechanisms and patterns* (Chown & Nicolson, 2004), won the Bill Venter/Altron book award. The second, co-edited book is titled *Nectaries and nectar* (2007). Prof Nicolson holds a B2-rating from the National Research Foundation (NRF) and currently has an h-index of 25 on the ISI Web of Science. The Zoological Society of Southern Africa awarded her a gold medal in 2010, and she is a fellow of the Royal Society of South Africa.

*Read more on page 5*

## Exceptional Academic Achievers



Prof Danie Auret



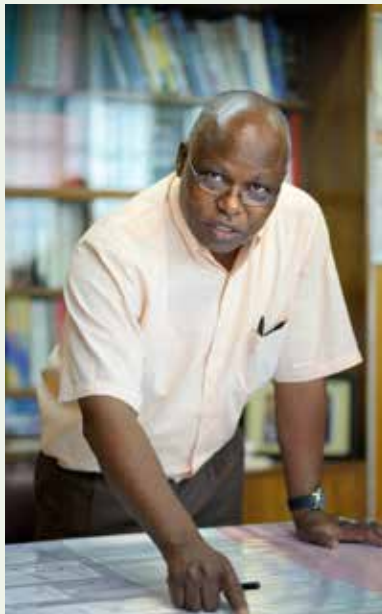
Prof Nigel Bennett



Prof Teresa Coutinho



Prof Johann Kirsten



Prof Jean Lubuma



Prof Bob Millar



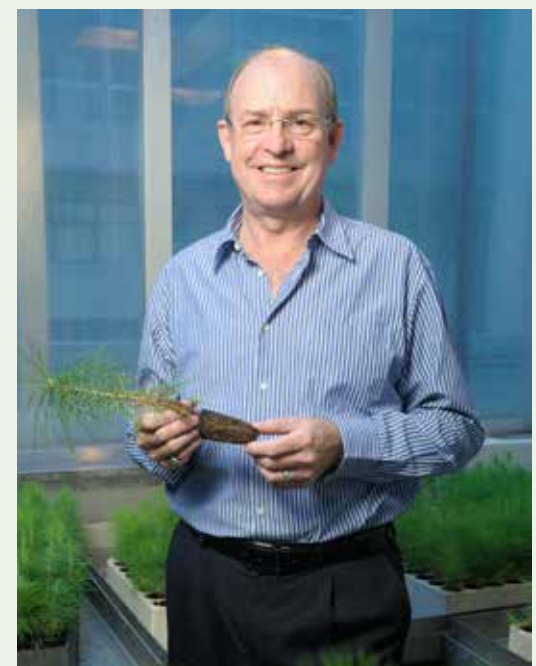
Prof Zander Myburg



Prof Louis Nel



Prof John Taylor



Prof Mike Wingfield

## Exceptional Young Researchers

In the category **Exceptional Academic Achievers** the following academics from the Faculty of Natural and Agricultural Sciences were recognised for their research: Prof Danie Auret (Department of Physics), Prof Nigel Bennett (Department of Zoology and Entomology), Prof Teresa Coutinho (Department of Microbiology and Plant Pathology), Prof Johann Kirsten (Head: Department of Agricultural Economics, Extension and Rural Development), Prof Jean Lubuma (Head: Department of Mathematics and Applied Mathematics), Prof Andrew McKechnie (Department of Zoology and Entomology), Prof Bob Millar (Department of Zoology and Entomology, Director of the Mammal Research Institute), Prof Zander Myburg (Department of Genetics – Chair in Forest Genomics and Biotechnology), Prof Louis Nel (Department of Microbiology and Plant Pathology), Prof John Taylor (Department of Food Science) and Prof Mike Wingfield (Director of the Forestry and Agricultural Biotechnology Institute (FABI)).

The **Exceptional Young Researchers** in the Faculty are: Prof Lyn-Marie Birkholtz (Department of Biochemistry – SARChI Chair in Sustainable Malaria Control), Prof Christine Maritz-Olivier (Department of Genetics), Prof Marietjie Oosthuizen (Research Fellow in the Department of Zoology and Entomology) and Prof Bernard Slippers (Department of Genetics – Research Leader of the Tree Protection Co-operative Programme and Centre of Excellence in Tree Health Biotechnology at FABI).



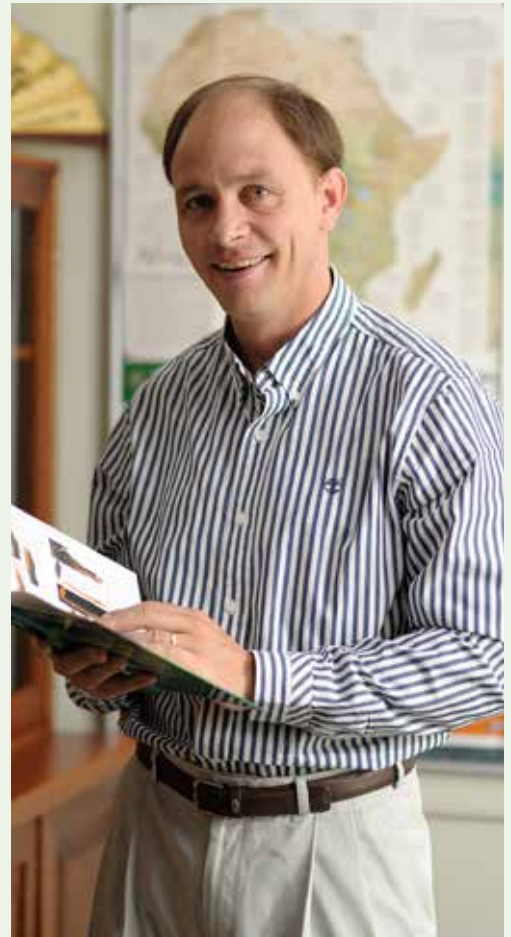
Prof Lyn-Marie Birkholtz



Prof Christine Maritz-Olivier



Prof Marietjie Oosthuizen



Prof Bernard Slippers



Prof Mike Wingfield

## Prestigious AU award for Prof Mike Wingfield

Prof Mike Wingfield, Director of the Forestry and Agricultural Biotechnology Institute (FABI), has been awarded the prestigious Continental African Union (AU) Continental Scientific Award in the Life and Earth Sciences category.

The AU Scientific Award Programme is a symbol of the commitment of AU heads of state and the government to raise community awareness and to engage African citizens in Africa's science. It also seeks to improve technology programmes and to strengthen the continent's research capacity.

In 2012, Prof Wingfield was awarded the prestigious Johanna Westerdijk Award by the *Centraalbureau voor Schimmelcultures* (CBS) (Fungal Biodiversity Centre, the Netherlands), and in November he also received an honorary DSc degree from the University of British Columbia.

He has published widely on the topic of tree health in more than 600 research papers and five books and as an invited speaker he has made numerous prestigious presentations globally. He has served in many distinguished positions and has received numerous awards and honours for contributions to education, research and industry in South Africa and elsewhere in the world. Based on these contributions, he has been elected as a fellow of scientific societies, including the Royal Society of South Africa, the Academy of Sciences of South Africa, the Southern African Society for Plant Pathology and the American Phytopathological Society. He is one of the few honorary members of the Mycological Society of America.

The award was presented to Prof Wingfield at the AU headquarters in Addis Ababa, Ethiopia on 25 May 2013.

# Reaching for the stars

At one of the recent graduation ceremonies of the University, Dr Christina Botai, researcher at the Hartebeesthoek Radio Astronomy Observatory (HartRAO), received a doctoral degree from the Faculty of Natural and Agricultural Sciences, with a thesis focused on space geodesy. She received this degree only two years after her husband, Dr Joel Botai, had also received a doctoral degree in the same study field at the University of Pretoria (UP).

Dr Christina Botai conducted her doctoral thesis with the title 'Evaluation of earth gravity field models used for precise satellite orbit determination through applications of satellite laser ranging data' under the supervision of Prof Ludwig Combrinck. He is not only an extraordinary professor in the Department of Geography, Geoinformatics and Meteorology, but also Associate Director Space Geodesy at HartRAO.

Dr Joel Botai, a senior lecturer in the Department, also holds two previous master's degrees in space engineering and in astrophysics. He was recently appointed to the Special Committee of Experts in the National Space Science programme of the South African National Space Agency (SANSA), and is currently working on an ambitious initiative to establish a strong national space science discipline in the Department of Geography, Geoinformatics and Meteorology.

With two doctoral degrees, there is no doubt that the Botai family will be in a strong position to make a significant contribution to the future advancement of space sciences at the UP and in South Africa.



From left: Dr Joel Botai (Department of Geography, Geoinformatics and Meteorology), Prof Ludwig Combrinck (Associate Director: Space Geodesy, HartRAO) and Dr Christina Botai (Researcher: HartRAO,) at the graduation ceremony on 17 April 2013.

# UP receives SARChI Chair in Mathematical Models and Methods in Bioengineering and Biosciences

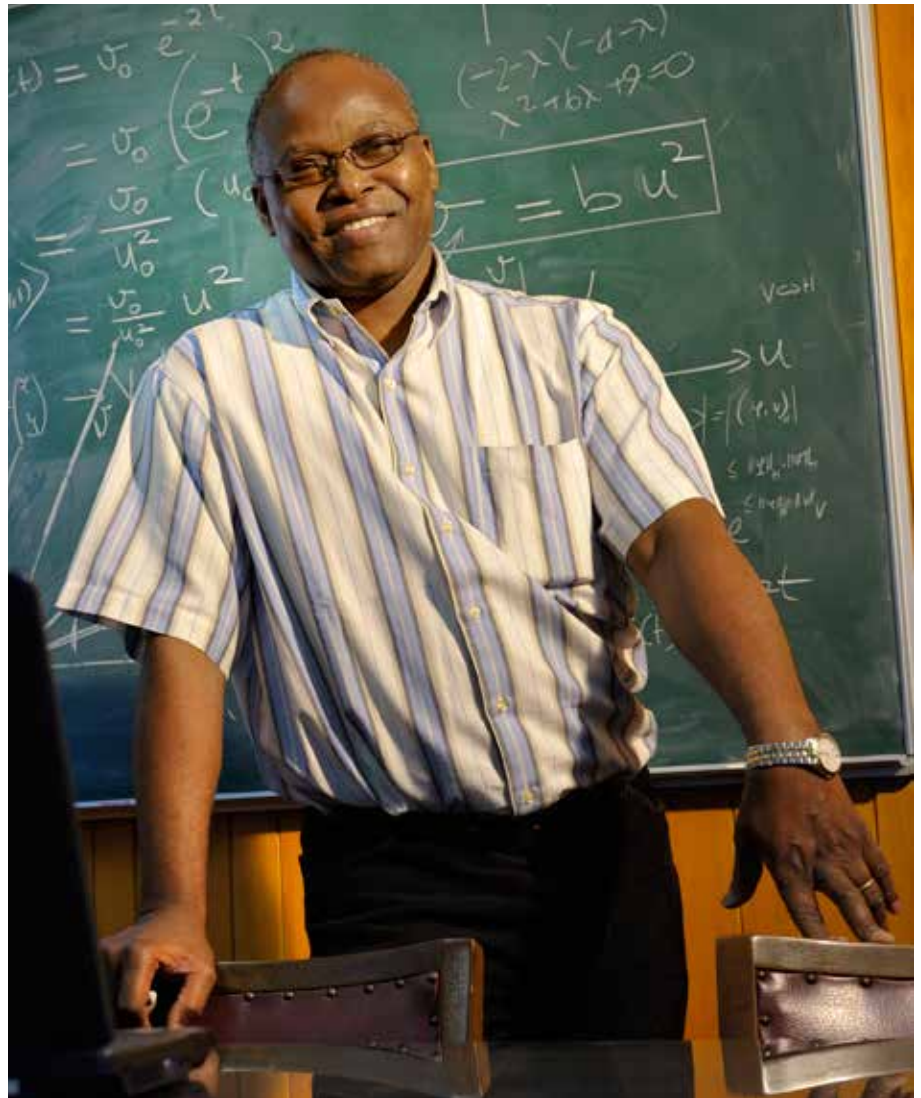
The University is proud to be the recipient of the SARChI Chair in Mathematical Models and Methods in Bioengineering and Biosciences. Prof Jean M-S Lubuma, a renowned mathematician who is currently the Head of the Department of Mathematics and Applied Mathematics, will lead this prestigious Research Chair with a budget of R2,5 million per year.

The South African Research Chairs Initiative (SARChI) was established by the South African government as a strategic intervention to reverse brain drain in the public academic and research sector. In particular, the programme aims to increase scientific research capacity through the development of human capacity and stimulate the generation of new knowledge.

Although mathematics has long been intertwined with the biological sciences, an explosive synergy between biology and mathematics has been happening for the past few decades, which has contributed greatly to the enrichment and extension of both fields. As JE Cohen, a mathematical biologist said, 'Mathematics is biology's next microscope, only better; biology is mathematics' next physics, only better.'

"The Department of Mathematics and Applied Mathematics started getting closely involved with the previous UP School for Biological Sciences in 2007," explains Prof Lubuma. He adds, "The milestones in research activities we conducted since then include the 2008 and 2010 workshops on mathematical epidemiology, as well as the launch in 2011 of the Biomath Forum, an interdisciplinary research gathering for the exchange of ideas between mathematicians and biologists at the University."

The research focus of this Chair lies at the intersection of mathematical modelling of biological processes and a spectrum of mathematical specialisations, broadly located within analysis. "The biological processes to be



Prof Jean Lubuma

considered within the Chair are highly relevant to the needs of the country," says Prof Lubuma. These include mathematical epidemiology, specifically the identification of adequate responses to new diseases and to old forms of new diseases such as HIV/Aids and other communicable diseases that pose a massive threat to development of South Africa and beyond. He went on saying that "this SARChI Chair offers opportunities for collaboration with some of our Institutional Research Themes and Faculty Research Themes and will contribute to the implementation of UP strategic plan and

vision for 2025 of being a leading research-intensive university in Africa".

Another interesting initiative that will be created within this Chair is the Under-Twenty Mathematicians (UTM) programme. This programme is aimed at identifying, recruiting and grooming talented young South African citizens to become mathematicians, a category that dominates the national scarce-skills list. The target audience is Olympiad winners and top undergraduate students in Mathematics.

# SARChI Chair in Sustainable Malaria Control awarded to UP

UP is one of the leading institutions in malaria research in South Africa, recognised for its focus on malaria parasite biology, functional genomics, structure-based drug discovery efforts, innovative vector control strategies and public health and community engagement. This is just one of the many reasons why the University was awarded the South African Research Chairs Initiative (SARChI) Chair in Sustainable Malaria Control with a budget of R1,5 million per year, funded by the Department of Science and Technology (DST) through the National Research Foundation (NRF).

The Chair will be headed by Prof Lyn-Marie Birkholtz, an associate professor in the Department of Biochemistry and a member of the UP Centre for Sustainable Malaria Control (UPCSMC), as well as a member of the European Virtual Institute of Malaria Research. The Chair will be hosted within the UPCS MC. Prof Birkholtz is a leader in the discipline of antimalarial target discovery for sustainable malaria control. As chair holder, her expertise on the parasite will be used to investigate sustainable mechanisms to control not only the malaria parasite itself, but also its mosquito vector. It is envisaged to tightly link parasite,

as well as mosquito vector, control through strategies aimed at sustainable physical and chemical interference of parasite transmission.

Malaria is responsible for almost a million deaths annually, 90% of which occur in Africa. Approximately 40% of the world's population live in areas at risk of malaria transmission, and 10% of the South African population is at risk of contracting the disease. The vision of the UPCS MC is to make a substantial contribution towards the creation of a malaria-free Africa, and to do so in a sustainable manner by employing transdisciplinary strategies.

The SARChI Chair in Sustainable Malaria Control is very well aligned with the South African government's 10-year strategy on several levels. *South Africa's National Research and Development Strategy*, published in 2002, and the *National Biotechnology Strategy for South Africa* of 2001, both emphasised the importance of the biosciences and biotechnology as drivers of economic growth. In this context, the UPCS MC is working in partnership with the National Department of Health and the Chair will contribute to the National Malaria Programme's aim to eliminate malaria in South Africa.

## UP Water Institute receives four research chairs from Rand Water

Water is second only to air in importance to life. The University of Pretoria (UP) subscribes to this view and is therefore proud to announce that the UP Water Institute, which is recognised internationally for quality education and research in water, was successful in four of the six Rand Water chair positions it applied for.

The successful applications are the two chair positions applied for by Prof Fanie van Vuuren and Prof Stephan Heyns in civil engineering and mechanical engineering, a chair position addressing public health applied for by Prof Maureen Taylor and the position of a chair in microbiology applied for by Prof Fanus Venter.

Rand Water advertised seven research chairs positions in November 2012 and all universities were invited to tender. The University, through its Water Institute (headed by Prof Anton Ströh, Dean of the Faculty of Natural and Agricultural Sciences), applied for six of the chair positions.

It should be noted that the timeframe was very short and that the commitment of all involved (researchers, heads of departments, deans, Research Support's office staff and the Deputy Vice-Chancellor for Research) was a key success factor for submitting a high-quality response to the call.

The Water Institute aims to constructively contribute, through its structures and external involvement, to finding solutions to Africa's water challenges.

The chair positions are set for five years each, with a grant of about one million rand each per year.



Prof Lyn-Marie Birkholtz





Prof Teresa Coutinho, Prof Bernard Slippers and Prof Pedro Crous (CBS). Prof Slippers was awarded the JE Vanderplank Award.



Vicky Knight and Dr Rikus Kloppers of Pannar presenting Darryl Herron with the Pannar Shield for the best presentation by a student at the SASPP Congress.



Prof Lisa Korsten and Prof Pedro Crous (CBS). Prof Korsten was elected as a fellow of the SASPP.

## UP shines at 48th SASPP Congress

Students and staff of the Faculty of Natural and Agricultural Sciences flew the University's flag high at the recent 48th Congress of the Southern African Society for Plant Pathology (SASPP) at Bela-Bela in Limpopo during January 2013.

Several members of the departments of Microbiology and Plant Pathology, Plant Science and Genetics attended the Congress during which they were rewarded for their scientific achievements and contributions to the society. Apart from excelling in science, these staff and student members of the Faculty also took home some prizes in the "fun" competitions at the Congress, showing a well-balanced approach to life!

Prof Lise Korsten of the Department of Microbiology and Plant Pathology was elected as a fellow of the SASPP. She was awarded this fellowship in recognition of outstanding accomplishments in Plant Pathology, as well as her support for and service to the Society, and to Plant Pathology in Southern Africa.

Prof Bernard Slippers of the Department of Genetics and the Forestry and Agricultural Biotechnology Institute (FABI) was granted the JE Vanderplank Award. This award is granted to an outstanding "young" plant pathologist based on evaluation of his or her research. Prof Slippers already has an

H factor of 21, holds a P-rating from the National Research Foundation (NRF) and has produced more than 100 publications, making him the well-deserved first recipient of this prestigious award.

Johan van der Linde, a PhD student in the Department of Microbiology and Plant Pathology and FABI, was the second recipient of the John and Petakin Mildenhall award to a PhD student. This award recognises academic excellence and potential. Johan, who is just starting the second year of his PhD research, has already published three papers in international scientific journals (from his MSc) and has presented talks and posters at both national and international congresses.

UP students were among the top achievers in the categories for presentations and posters by students at the Congress. Darryl Herron (Department of Microbiology and Plant Pathology, FABI) received the Pannar Prize for the best presentation overall by a student, with Johan van der Linde (PhD student in Department of Microbiology and Plant Pathology, FABI) being a close second in this category. In the category for the best molecular presentation by a student, Anandi Reitman (Department of Genetics, FABI), received the Inqaba Biotech prize for the best presentation. Juanita Engelbrecht (Department of Microbiology and Plant Pathology) was second.

# A torrent of sequence data for UP

The University of Pretoria has joined the high-volume genomic revolution with the acquisition of an Ion Torrent Personal Genome Machine. The instrument can generate up to 1 Gbp sequence data in less than a week and will greatly improve the access time to genomic sequencing for all researchers at the University.

The instrument is housed in a dedicated laboratory in the new Plant Sciences Complex and is co-managed by Renate Zipfel (DNA Sequencing Facility Manager) and Nicky Olivier (Scientific Officer, ACGT Microarray Facility), with Prof Brenda Wingfield acting as Facility Director. Funding for the instrument was provided by the Institutional Research Theme (IRT) for Genomics, the Centre for Tree Health Biology at FABI, and several departments in the Faculty. The library preparation and sequencing setup is performed by Dr Elritha van Zyl, the part-time technician.

The instrument can accommodate three types of sequencing chips, producing from 30 Mbp to 1 Gbp, and this allows the instrument protocols and output to be tailor-made to the requirements of each research project. Currently the instrument produces sequence data with 300 bp read lengths, but by mid-2013 the read length will be increased to 400 bp, thereby increasing both the yield and cost efficiency for projects.



Ms Renate Zipfel, Dr Elritha van Zyl, Prof Don Cowan (Genomics IRT) and Mr Nicky Olivier with the Ion Torrent PGM sequencer.

To date, the facility has sequenced several bacterial and fungal genomes, and is soon to start with sequencing viral DNA samples. As the workflow allows for barcoding, several samples can be pooled and sequenced on the chip, thereby lowering sequencing costs and increasing research outputs. The technology is also ideally suited to amplicon sequencing and with the longer reads, this approach should increase the efficiency of various genotyping projects in the Faculty.

Sequence analysis is also a critical component of the process, and Prof Fourie Joubert of the Bioinformatics and Computational Biology Unit is available for consultations.

For enquiries, please send an email to [renate.zipfel@up.ac.za](mailto:renate.zipfel@up.ac.za) or [nicky.olivier@up.ac.za](mailto:nicky.olivier@up.ac.za).



## CMEG team does research in Namib Desert



Prof Don Cowan, Director of the Centre for Microbial Ecology and Genomics (CMEG) at the University of Pretoria recently led the team of 20 members from CMEG on a week-long field research programme to the Gobabeb Research and Training Centre in the Namib Desert. They were accompanied by researchers from the

University of the Western Cape (UWC), the University of Cape Town (UCT), the Heriot-Watt University, Karlsruhe Institute of Technology and the Spanish National Research Council (Consejo Superior de Investigaciones Científicas – CSIC),

Building on the work done during two previous visits, the team undertook the first comprehensive survey of Namib Desert microbiology, using the latest molecular phylogenetic measurements.

Samples recovered during the research expedition have been returned to the CMEG laboratory for chemical, physical and molecular analyses. These studies will rely heavily on genomic and meta-genomic methods and will extensively employ next generation DNA sequencing.

Individual research projects will focus on the gravel desert soils, the dune and inter-dune environments, the microbiology of different soil types and soil ages, and specialised niche environments such as spear-grass mounds, saline springs, 'fairy circles' and hypoliths. Macro and microclimatic effects, soil chemistry, carbon turnover and other factors are all expected to influence microbial community structures. These studies will include surveys of bacterial, fungal and bacteriophage diversity.



# Fog nets assist in improving sustainable use of water

Establish an infrastructure around a water supply and provide community education about the sustainable use of water resources. By addressing these two goals, the Meteorological Community Project created a win-win situation for Meteorology students and rural communities in South Africa.

This community project has been running since 1999 and now also forms part of students' curriculum, either as a module in their Meteorology studies, or as a research topic in honours or BEng (Civil) projects. Although this project in the past visited the West Coast and the Transkei, most of the current activities took place at rural schools in Venda.

The initial contact with the Venda schools was established around the erection and maintenance of a fog water collection system (fog net). A fog net is a simple structure where a net is erected



Fog net at Tshiavha Primary School. This fog net was erected by second year meteorology students in 2007.

between sturdy horizontal poles. As fog moves through the net, the water collects on the net and trickles down to a gutter at the bottom of the net.

In addition to the fog nets, this project also attached gutters to several school buildings in the district. Water collected in this way is stored and used in a way decided by the educators at the school. Some of the schools use the water to

irrigate vegetable gardens and others use it for sanitary purposes.

Currently, the University of Pretoria, Department of Geography, Geoinformatics and Meteorology, together with its sponsors, namely the South African Breweries and South African Weather Service have established a very close relationship and are continuing to build the fog nets as part of their commitment to this community engagement project.

The fog nets in particular provided a unique education opportunity. This process starts off by explaining to the educators and learners how the fog nets work and how to maintain these nets. As they endeavour to educate concerning meteorology, the students can introduce concepts such as condensation and fog formation, to the scholars.

## Tshanowa fog net – a new initiative, better design

Tshanowa Primary School received the first fog net constructed by this project in 1999. The net consisted of a flat screen, double folded 40% shade cloth with a total catchment area of 72 m<sup>2</sup>. Unfortunately, lack of maintenance resulted in the deterioration of the system. Since 2001 a UP team maintained and repaired the system from time to time, as part of the Meteorology community project. The University and the Department of Geography, Geoinformatics and Meteorology with its sponsors took the responsibility for the re-erection of a new fog net, with support from the students.

Research resulted in a more robust fog catcher system, where the basic structure forms a triangle with the three poles 11 metre apart, supporting three fog net composite panels, each 30 m<sup>2</sup>.

In 2008 the project won the Educating Africa, Pan-African Award for Entrepreneurship in Education: Teach a Man to Fish. It was also published internationally in the Bulletin of the American Meteorological Society in an article titled "A Meteorological Community Project in South Africa".



A newly operational triangular designed fog net, trapping fog at Tshanowa Primary School, March 2013. Picture: Prof Van Heerden.

# Global research to control stem rust disease prevents huge losses



Prof Philip Pardey (middle) discussing the effects of stem rust on many of the world's major wheat growing areas with Jason Beddow (University of Minnesota) and Dr Frikkie Liebenberg (UP Department of Agricultural Economics, Extension and Rural Development) on the left during a recent visit to the Department.

A study just published in *Science* by scientists from the University of Minnesota, Commonwealth

Scientific and Industrial Research Organization (CSIRO), the University of Sydney, the University of Queensland, and the International Maize and Wheat Research Centre (CIMMYT) shows that research to control the wheat disease known as stem rust during 1961 to 2009 has added 6.2 million tons annually to world wheat harvests, worth US \$1.12 billion per year at 2010 prices.

Prof Philip Pardey, an honorary professor at the University of Pretoria's Department of Agricultural Economics, Extension and Rural Development was one of the researchers involved in this study.

However, the emergence of Ug99, a virulent stem rust strain first detected in Uganda in 1999, instigated a major problem for farmers. The disease is capable of killing wheat plants and small grain cereals, but more typically reduces foliage, root growth, and grain yields. After years of keeping stem rust at bay, Ug99 has spread from Africa to Iran, and the race is on to identify resistant genes, introduce these into locally adapted wheat varieties, and get the finished product into the hands of farmers.

Investments in breeding for resistance to stem rust have declined in recent decades, making the potential impact of Ug99 even more harmful, as most popular varieties are susceptible to the disease. A paper published in *Science* presents the results of a global stem rust assessment study, which asked: Is increased investment needed for wheat stem rust research to avert crop losses from current and future strains? Using novel, probabilistic risk assessment methods, including climate suitability models

and long-term global loss data, the authors estimated the economically justifiable investment in research and intervention strategies to avert future losses from stem rust.

The study found that, had there not been investment in stem rust research and ensuing effective global control during 1961-2009, losses in wheat production would have amounted to 6.2 million tons annually, or 1.3% of the total harvest. This equates to losses of US \$1.12 billion per year at 2010 prices, or enough wheat to satisfy almost the entire annual calorie deficit of sub-Saharan Africa's undernourished population. Whilst much lower than previous estimates, the losses are sizeable for the effects of just one disease on a staple food crop. This new study represents a major advance in disease-risk assessment as it accounts for variability of disease-induced crop losses over space and time.

The study concludes that "maintaining yield growth rates necessary to meet anticipated future demands will require a sustained effort to develop wheat varieties that are resistant to contemporary strains of rust. This requires an investment strategy that supports sustained research programs geared to identifying and addressing ever evolving stem rust threats." This investment strategy should amount to an economically justifiable US \$51 million per year, according to the authors. Whilst this is double the value invested in recent decades, such measures are essential if we are to stop the spread of Ug99 and other new strains of stem rust and improve food security for the millions of wheat-dependent consumers in developing countries.

## Geoinformatics degrees receive accreditation from PLATO

The South African Council for Professional and Technical Surveyors (PLATO) has accredited the University of Pretoria's Geoinformation Science (GISc) degrees. The accreditation was performed through a self-review, which was evaluated by the PLATO Education Advisory Committee. The BScHons Geoinformation degree received accreditation for complying with the requirements for registration as a professional GIScience practitioner, whereas the BSc Geoinformation degree was accredited for complying with the requirements for registration as a GISc Technologist.

The Professional and Technical Surveyors Act (Act Nr 40 of 1984) requires PLATO to accredit academic courses at educational institutions as well as accrediting qualifying graduates of those courses for registration in the PLATO categories of professional and technical practitioners.

# New initiative in regulatory science

A Green Chemistry Platform has been established within the Institute for Food, Nutrition and Well-being (IFNuW) at the University of Pretoria (UP) with the aim of integrating research and training activities within a broader concept of pesticide regulatory control. The University, in partnership with the Department of Agriculture, Forestry and Fisheries (DAFF) and Becker Underwood, has established this new training initiative.

According to Prof Lise Korsten, IFNuW Theme Leader for Food Safety, Biosecurity, Public Health and Regulatory Control, the scientists working within this knowledge platform will provide technical input into governance,

Prof Korsten also indicated that aligned with this, the DAFF recently established a capacity-building programme within the regulatory science field. This initiative was launched mainly for the development of scientists in the field of eco- and mammalian toxicology with special emphasis on risk assessments. Funding will be allocated for postgraduate students in fields such as pharmacy, pharmacology, epidemiology and specifically toxicology. A requirement for funding will be that postgraduate students must be registered with the South African Veterinary Council (SAVC) or the South African Council for Natural Scientific Professions (SACNASP). Postgraduate students will be trained in regulatory toxicological risk assessments in the



Research

regulatory control and development of green technologies. The platform represents an open-ended source of technical experts that can advise the Registrar in matters pertaining to Act 36 of 1947, and provide linkages and mentorship programmes for postgraduate students working in the field of regulatory science and agriculture.



faculties of Veterinary Science, Health Sciences and Agricultural and Natural Sciences at the University. The successful candidates will, after completion of their master's studies, be based at the DAFF to address the critical skills shortage in this regulatory field.

Prof Korsten concluded that the programme also includes a focus on plant health in pesticide regulatory science. Funding has been made available by Becker Underwood for the promotion of agricultural studies at the University to promote interest in agricultural research in South Africa. The aim of this partnership is to develop talented young people who will have a positive impact on the country and continent and to build awareness and expertise related to the utilisation of biological technologies in agriculture. Through the collaborative programme financial funding will be provided to eight MSc students linked to research programmes funded by Becker Underwood. The programme will be managed by the IFNuW and will be aligned with the following areas related to agriculture, health, nutrition and food safety, but not limited to: eco- and mammalian toxicology, plant pathology, entomology, soil health and weed science.

The total amount that will be invested by Becker Underwood and the DAFF into this initiative over a four-year period is R2,72 million in a classic tri-partite relationship.

# Impact of mining activities on agriculture

Agriculture and mining have been the key driving forces behind the South African economy for a number of centuries. Although their contribution to Gross Domestic Product (GDP) has shrunk significantly as the economy developed over time, these two industries remain at the heart of economic growth and the creation of unskilled job opportunities.

In order to highlight the impact of a loss in productive land on market prices, a pilot study was done in the Delmas, Ogies and Leandra region by Mr Gerhard van der Burgh and Dr Ferdi Meyer, both from the Bureau for Food and Agricultural Policy \*(BFAP).

With the sharp rise in the world's demand for minerals, driven mainly by India and China, the rate of expansion in mining activities over the past 10 to 15 years has been phenomenal. The areas where the expansion in mining activities is taking place, ranges from desolate areas with limited agricultural potential, to areas with high agricultural potential. For example, in the Mpumalanga Province agricultural land is taken over by mining activities. At the current rate of coal mining in Mpumalanga, it was calculated that approximately 12% of South Africa's total high potential arable land will be transformed into coal mining areas, while a further 13.6% is earmarked for prospecting by the mines in Mpumalanga.

This implies that, due to the expansion in mining activities, a significant portion of the most agriculturally productive land in South Africa could go out of production within the foreseeable future. In the pilot study, the total size of the area approximated 79 967 hectare. The potential loss of maize production from current mining activities and activities in the near future within the pilot area, amounts to 284 844 tons per annum.

A further 162 736 tons of maize could be lost from the prospecting areas. Modelling results suggest that over the long-run the reduction of 447 581 tons of maize production per year, would result in an average annual price increase of R300 per ton. This amounts to approximately 14 % above benchmark simulations, which in turn would cause maize meal prices to rise by approximately 5 %.



\*The **Bureau for Food and Agricultural Policy (BFAP)** ([www.bfap.co.za](http://www.bfap.co.za)) is a virtual network linking individuals with multidisciplinary backgrounds to a co-ordinated research system that informs decision making within the Food System. The core analytical team consists of independent analysts and researchers who are affiliated with the Department of Agricultural Economics, Extension and Rural Development at the University of Pretoria, the Department of Agricultural Economics at the University of Stellenbosch, or the Directorate of Agricultural Economics at the Provincial Department of Agriculture, Western Cape.



Dr Ferdi Meyer

# UP plays a key role in addressing rabies in Africa

Africa is a continent rich in culture and diverse wildlife. Unfortunately the continent is also plagued by poverty and diseases. Among these, rabies – caused by a virus – is a most horrific disease that is widespread throughout Africa.

Rabies causes tens of thousands of deaths every year, primarily affecting children and teenagers in communities already afflicted by poverty. The situation is aggravated by the fact that the disease is completely preventable with existing tools.

It was against this background that the Southern and Eastern African Rabies Group (SEARG) was formed in 1992, initially with a focus on rabies elimination and control in Southern and Eastern Africa, but later expanding our focus to Africa as a whole. The 11th international SEARG meeting, organised by Prof Louis H Nel (Chair) and his students from the Department of Microbiology and Plant Pathology in the Faculty of Natural and Agricultural Sciences, was held



Some of the international participants who attended the conference, outside of the Kunduchi Beach Hotel near Dar es Salaam.



During a breakaway session, delegates discuss new ideas for a progressive control pathway towards rabies control.

near Dar es Salaam, Tanzania, in February. Seventy delegates from 11 African countries, as well as several international collaborators and representatives from international organisations and vaccine companies, including the World Health Organisation (WHO), the World Health Organisation for Animal Health, the Food and Agriculture Organizations of the United Nations, the Bill and Melinda Gates Foundation, the Global Alliance for Rabies Control, Meril, Sanofi-Pasteur and Novartis attended the meeting. Various WHO-collaborating centres for rabies, as well as OIE reference laboratories from across the globe were also represented.

The conference was a resounding success, with new strategies towards the effective control of rabies in Africa and the elimination of human deaths due to rabies being pursued at a national and regional level. UP and its staff and students have pledged their continued participation in the global efforts towards the elimination of rabies.



Decide for yourself: The composite image on the left shows the eight men with the weakest immune response, while the image on the right depicts the eight men with the strongest immune response. What is the main difference between these images?

## What makes some men more attractive than others?

Which physical attributes arouse a woman's interest in a man? It appears that this attribute is a man's weight, according to the findings of a team of international researchers from Finland, the United Kingdom, South Africa and Latvia. The results of their study, entitled 'Adiposity, compared to masculinity, serves as a more valid cue to immunocompetence in human mate choice', recently appeared in the respected scientific journal *Proceedings of the Royal Society of London, B*.

According to Dr Vinet Coetzee of the Department of Genetics at the University of Pretoria, masculine features such as a strong jawline, a prominent brow and a muscular body are generally thought to make the fairer sex swoon, basically because these features are believed to indicate that the man has a strong immune system.

'Secondary sexual traits like masculinity were proposed to be indicators of male genetic quality because they supposedly indicate that males can deal with the immunosuppressive effects of testosterone,' explained Dr Coetzee.

Studies have, however, revealed that women do not consistently prefer masculine-looking men, and that masculinity is not consistently related to health.

To determine the reason for this, the research team measured men's antibody response to Hepatitis B vaccinations, a direct measure of immune response, in a group of 69 Latvian men. They found that a man's weight serves as a stronger link between immunity and attractiveness than his masculinity.

'The study revealed that adiposity, and not masculinity, significantly mediates the relationship between a direct measure of immune response and attractiveness for both body and facial measurements. It also showed that circulating testosterone is more closely associated with adiposity than with masculinity. These findings indicate that adiposity, compared to masculinity, serves as a more important cue to immunocompetence in women's choice of a mate. In other words, it is more likely that Latvian women would use weight, rather than masculinity, in their subconscious judgements of men's immunity,' said Dr Coetzee.

Front: Mr Yoshiaki Takahashi (Senior Researcher: Global Research and Development, Kao Corporation), Mr Akihiko Muroya (Director: Kwawasaki Kiko) and Mr Susumu Oishi (Principal Researcher: Global Research and Development, Kao Corporation).

Back: Prof Zeno Apostolides (Department of Biochemistry, UP), Prof Yukihiko Hara (President: Tea Solutions, Hara Office), Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences, UP) and Mr Takeshi Okada (Director: Development Division, Kawasaki Kiko).



## Biochemistry initiates commercial African green-tea venture

Not only was a Memorandum of Understanding between the University of Shizuoka and the University of Pretoria finalised recently, but the Department of Biochemistry in the Faculty of Natural and Agricultural Sciences was also instrumental in the creation of an African green-tea product in a small pilot plant at the Ntingwe Tea Factory in KwaZulu-Natal.

This project kicked off when the Tea Research Laboratory under the leadership of Prof Zeno Apostolides from the Department of Biochemistry sent 20 kg of a prototype green tea to Prof Yukihiko Hara from Tea Solutions in Japan. As Prof Hara is a former director of Research and Development for Mitsui Norin (the largest tea importer into Japan), and a world-famous scientist on the health properties of green and black tea extracts, he was the ideal person to liaise with. Prof Hara is also the creator of the

only green-tea extract product approved by the FDA in the USA. He has co-authored 96 publications and has an ISI h-index of 39.

Professors Apostolides and Hara have been collaborating on tea research since they met at a tea and health conference in New York during 1998, and through their negotiations the tea was offered to a prospective buyer in Japan, where it was received very enthusiastically.

During February, Prof Hara led a delegation of four Japanese industrialists to South Africa in order to visit the tea factories in South Africa and to taste the teas we produce. They wished to buy tea from South Africa for the ready-to-drink tea market (ice tea in bottles or cans) in Japan. They visited the Ntingwe Tea Factory in KwaZulu-Natal, the Mukumbane Tea Factory in Limpopo and the Tanganda Tea Factory in Zimbabwe. The

delegation was especially interested to see for themselves the neatness of the tea gardens, the sanitation of the tea factories and the fair labour practices employed. Another issue was the use of chemical herbicides and insecticides on the tea. They were satisfied that we are far above par on all these issues relative to other tea factories in African and Asian countries.

The current pilot plant has limited production capacity and needs to be replaced by a full commercial factory. The commercial tea factory will have a scaled-down pilot plant situated at the University of Pretoria. The pilot plant will be available to science and engineering students to experiment with new products and processes that can be easily up-scaled to the commercial tea factory.



## High-level discussion on wildlife trafficking

Dr Robert Hormats, Under Secretary of State of the United States (US) recently addressed a wildlife trafficking panel discussion at the University of Pretoria. Dr Hormats is a major champion on these issues in the US government, and the US regards wildlife trafficking as a national security issue and is doing a number of things at various levels to combat it. Dr Hormats visited South Africa last year with Hillary Clinton, and it really impressed him that the US needed to get involved and help in some way. The aim of the discussion was to address the larger issue of wildlife trafficking and its connections to international criminal syndicates, and how high-level political will is needed to stop them.

From left: Prof Robin Crewe (Acting Senior Vice-Principal, UP), Prof Michael Somers (Lecturer, Centre for Wildlife Management, UP), Dr Robert Hormats (US Under Secretary of State), Dr Bandile Mkhize (CEO: Ezemvelo KZN Wildlife), Prof Bob Millar (Director: Mammal Research Institute, UP), Dr Mike Knight (Chairman: IUCN African Rhino Specialist Group) and Mr Fundisile Mketeni (Deputy Director General: Department of Environmental Affairs).



# Mamelodi Campus Science Reading Room one of seven leading centres in world



The scholars at the Mae Jemison Reading Room at UP Mamelodi Campus.

The Mae Jemison US Science Reading Room at the University of Pretoria's Mamelodi Campus has been selected as one of seven "Model American Spaces" in the world through a project conducted by the Smithsonian Institution on behalf of the United States State Department. The Smithsonian Institution is the world's largest museum and research complex with 19 museums, nine research centres, and more than 140 affiliated museums around the world.

The Mae Jemison Science Reading Room is a science and technology learning facility for students and learners in and around the Mamelodi community. It was inaugurated in 2009 as a partnership between the American Embassy in Pretoria and the University.

The US State Department has about 800 "American Spaces" across the globe, where the Department, through its embassies, interacts with and engages local communities. It provides support and interventions, particularly through education and information sharing. Seven places were selected as leading examples of innovative ways to achieve this. The Mae Jemison Science Reading Room is the only one in Africa that was selected for the project.

Since its inception in 2009, there have been regular science education programmes. Apart from hosting English language classes, the facility has also presented over 30 special science programmes. Students from Mamelodi and surrounding townships attended the programmes. They regularly make use of the facility in terms of doing their homework, borrowing books and also using computers available to them.

The Mae Jemison US Science Reading Room can accommodate approximately 60 people. It is divided into three sections: a reading room, exhibition space and an audio-visual auditorium. The facility houses approximately 3 000 books and films and 58 magazine titles, with an emphasis on science and technology and other related topics. There are five computers with Internet access. The exhibition area is used for exhibitions, science experiments and demonstrations. The audio-visual auditorium can also be used for multimedia presentations and sessions.



## Ties with University of Lagos strengthened

Sitting in the front: Mrs Comfort Amund and Dr Matete Madiba (Director: UP Student Affairs. Standing: From left: Dr Anthony Adebayo (Deputy Dean of Student Affairs, University of Lagos), Dr Willem Jorissen, (Deputy Director: UP Student Affairs), Prof Olukayode Amund (Dean of Student Affairs, University of Lagos), Mrs Adebimpe Ajelabi (Assistant Registrar: Student Affairs, University of Lagos), Mr Afolabi Yusuff (Senior Assistant Registrar: Student Affairs, University of Lagos) and Mr Beni Letlebele (Consultant: UP Student Governance Constitution).

A delegation from the University of Lagos in Nigeria recently visited the University of Pretoria. Among others, the delegation, led by Prof Olukayode Amund (Dean of Student Affairs: University of Lagos) visited the faculties of Natural and Agricultural Sciences and Education as well

as the Department of Student Affairs. The aim of the visit was to discuss possible opportunities of collaboration between the two universities and also learn more about student affairs at the University of Pretoria.

## UP signs MoU with university in South Sudan



The Dr John Garang Memorial University of Science and Technology in the Republic of South Sudan recently formalised relations with the University of Pretoria (UP) by officially signing a memorandum of understanding and cooperation agreement between the two universities. Front: Prof Aggrey Majok (Vice-Chancellor of the Dr John Garang Memorial University of Science and Technology and Prof Robin Crewe (Acting Senior Vice-Principal, UP). Back: Prof Rashid Hassan (Director: CEEPA, UP) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences, UP).

# PPS donates generously to Insurance and Actuarial Science



From the left: Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences and Acting Head of the Department of Insurance and Actuarial Science), Prof Stephanie Burton (Vice-Principal: Research and Postgraduate Studies) and Mr Frans Lombard (Senior Manager: Distribution Support at PPS).

The Department of Insurance and Actuarial Science and the Professional Provident Society (PPS) recently renewed their partnership with a substantial sponsorship from PPS. An amount of R292 178, 80 was donated to refurbish and upgrade a multi-purpose meeting room in the Department to conference facilities. This includes state-of-the-art technology, for example Wi-Fi.

Mr Frans Lombard, Senior Manager Distribution Support at PPS emphasised the company's involvement with the University of Pretoria. He further mentioned that they sponsor prizes at the Faculty's annual Top Achievers function. "PPS is the largest multidisciplinary group of graduate professionals in the world, with more than 210 000 members. It is the only mutual financial services company in South Africa which has focused exclusively on graduate professionals for longer than 71 years."

Prof Stephanie Burton, Vice-Principal (Research and Postgraduate Studies), added that a partnership like this would further assist the University to deliver the best graduates in financial forecasting and mathematics.

## Another successful Actuarial Career Fair



The Department of Insurance and Actuarial Science hosted the seventh annual Actuarial Career Fair in the Rautenbach Hall early in May this year. It was sponsored by South African Actuaries Abroad (SA3), a brother and sister team who are also UP alumni. Honours students from North West University (Potchefstroom) and the University of the Free State were also invited. From left: Mr Wilhelm de Wet (SA3), Mrs Henda Pretorius (SA3), Mrs Johanna Helberg (Department of Insurance and Actuarial Science) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences and Acting Head: Department of Insurance and Actuarial Science).

## Can GIS prevent rhino poaching?

A point of despair, helplessness, sadness, defencelessness – how do we convert this feeling to a meaningful contribution and understanding of the threat of rhino poaching? Dr Corné Eloff, Principal Researcher in the Built environment at the CSIR tried to shed some light on this question during a guest lecture at the Centre for Geoinformation Science in the Department of Geography, Geoinformatics and Meteorology. Dr Eloff shared the findings of a recent multi-disciplinary research project, entitled *Rhino poaching in South Africa from an environmental perspective* and also explained how remote sensing, Geoinformation Science (GIS) and environmental criminological theories could be utilised to prevent this threat.



From left: Dr Serena Coetzee (Centre for Geoinformation Science), Mrs Sanet Eksteen (Centre for Geoinformation Science), Dr Eloff and Prof Hannes Rautenbach (Head: Department of Geography, Geoinformatics and Meteorology).

# DST Minister supports National Science Deans Forum

'Science faculties all over South Africa, and probably worldwide, face a number of similar challenges within the higher education system – hence the need for them to share best practices and to collectively develop strategies to advance science, not only in South Africa, but in the Southern African Development Community (SADC) region generally. So I welcome this opportunity to address the Forum, as it is important that we get together from time to time to provide feedback to each other and to re-align our thoughts.'

These were the opening words of the Minister of Science and Technology, Mr Derek Hanekom, at the National Science Deans Forum \*(NSDF) on 5 April 2013.

chairs, with 118 of those already having been filled.'

The Minister concluded his address by reassuring the deans about funding for Human Capital Development (HCD) – including postgraduate student support – and investment in research infrastructure over the next few years. 'In November last year, I announced the allocation of R798 million for HCD initiatives, and approved the transfer of these funds to the National Research Foundation for HCD in the 2012–13 Medium-Term Expenditure Framework (MTEF),' he pointed out. 'Also, over the 2013–14 MTEF period an additional investment of R400 million in the 2015–16 financial year has been made by



Prof Anton Ströh (Dean of the Faculty of Natural and Agricultural Sciences) and Mr Derek Hanekom (Minister of Science and Technology)

The Forum was chaired by UP's Dean of Natural and Agricultural Sciences, Prof Anton Ströh, who retired as the Chairperson of the NSDF after four years. He was also one of the founding members of the NSDF. Prof Hlengani Siweya, Executive Dean: Faculty of Science and Agriculture from the University of Limpopo, was elected as the new Chairperson.

During his address, Mr Hanekom emphasised that 'human capital development is at the heart of the work we do in the Department of Science and Technology (DST), and explained that the Department's Strategy for Human Capital Development for Research Innovation and Scholarship has been gazetted for public comment. The strategy aims to increase the number of active researchers and to enhance research and innovation skills, as well as outputs, in order to improve South Africa's international competitiveness as a producer of scientific knowledge and innovation in support of national socioeconomic development. It will also guide the investment in student training and researcher development, while maximising the outputs of established researchers.'

Mr Hanekom also spoke on the South African Research Chairs Initiative (SARChI) and emphasised that its aim is to strengthen research capacity and leadership at South African public universities by attracting established researchers from abroad and from industry to higher-education institutions, and retaining those already in the system. 'To date we have 154 research

the National Treasury towards postgraduate student support. The bulk of these funds will be given to the NRF for distribution for student bursaries and researcher-grant funding.'

\*The NSDF consists of all the deans of all the science faculties at the South African universities, including universities of technology, and was established in November 2006. The main reasons for establishing the NSDF are the following:

- to create a network for sharing policy information across the science higher education sector
- to create a national platform to interact with government through liaison with the Department of Science and Technology, the Department of Higher Education and Training, and the Department of Basic Education
- to identify critical areas of common challenges that science faculties face within the higher education system, with the aim of finding solutions
- to collectively develop strategies to advance science in SA and the SADC region through quality research and education
- to share best practices



A glimpse of the newly renovated facilities.

## New home for the Mammal Research institute and Mathematics

“In order to develop research and postgraduate education at the University, we need to create an enabling environment for our staff and students. The opening of the new home for the Mammal Research Institute (MRI) and Mathematics in the Faculty of Natural and Agricultural Sciences is an excellent example of our commitment to this goal. This will expand the University’s research and teaching facilities, which form part of the UP’s long term strategy (UP 2025). It will also promote the increase in the number of students in the Science, Engineering and Technology (SET) knowledge field.” These were some of the comments shared by the Vice-Chancellor and Principal, Prof Cheryl de la Rey, at the official opening of the revamped facilities in April.

She emphasised the significant contribution that the MRI has made to research over the past fifty years and said that “there is no doubt that the MRI is the premier research institute on African mammals in the world.” Prof De la Rey also elaborated on the importance of Mathematics as a discipline

and stressed that the African continent needs to promote skills and postgraduate research in the field of Mathematics. She concluded her address by emphasising the importance of multidisciplinary research and expressed the hope that the sharing of the facilities would help to “blur the academic boundaries” for the benefit of everyone.



From left: Prof Chris Chimimba (Head: Department of Zoology and Entomology), Prof Jean Lubuma (Head: Department of Mathematics and Applied Mathematics), Prof Bob Millar (Director: Mammal Research Institute), Prof Cheryl de la Rey (Vice-Chancellor and Principal), Dr Albert van Jaarsveld (CEO: National Research Foundation), Dr Clifford Nxomani (Managing Director: National Zoological Gardens) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences).

Prof Robert (Bob) Millar, Director of the MRI (based in the Department of Zoology and Entomology) highlighted some of the achievements and future endeavours of the Institute. In addition he announced a R32 million grant from the Tshwane Animal Health Cluster,

for research in collaboration with the Faculty of Veterinary Science. The Cluster is a Technology Innovation Agency-led initiative, established to stimulate the development of commercially viable technologies that specifically address the challenges confronting the animal health sector.

Prof Jean Lubuma, Head of the Department of Mathematics and Applied Mathematics, acknowledged that the newly renovated facilities constituted a significant positive step for the Department to refocus on the implementation of its strategic plan for research and postgraduate education. He added that sharing the building with the MRI is a golden opportunity for collaboration on multidisciplinary research within the SARChI Chair

in Mathematical Models and Methods in Bioengineering and Biosciences that the Department will be hosting. He concluded by stressing the urgent need for additional critical facilities due to the dramatic increase in student numbers in the past few years.

# Advising global governance on food security



Members who participated in the seventh meeting of the Committee on World Food Security High Level Panel of Experts on Food Security and Nutrition in Beijing in May this year.

Prof Sheryl Hendriks, Director of the Institute for Food, Nutrition and Well-being (IFNuW) at the University of Pretoria participated in May this year in the seventh meeting of the Committee on World Food Security (CFS) High Level Panel of Experts on Food Security and Nutrition (HLPE) in Beijing. The meeting was hosted by the Chinese Academy of Agricultural Sciences.

The panel of 15 international experts was appointed by the 192 member states of the CFS. The CFS is the highest level of global governance on food security. Each year, the CFS members select the two most pressing and controversial food security problems and request the HLPE to provide expert and strategic evidence-based policy advice to the 192 member states. The topics commissioned by the CFS have to date included: food price volatility, land tenure and

international investment in agriculture; climate change (Prof Rashid Hassan was part of the writing team for this paper), social protection, biofuels and smallholder investment in

agriculture. The last two reports were finalised during the recent meeting of the HLPE.

Being part of the first panel of the HLPE has been especially challenging, as the team had to pioneer a methodology for their work and earn the trust of the CFS member states through the elaboration of scientific reports written for policy makers, on extremely tough topics. The process of preparing these papers is unique in that they are authored by a team of internationally recognised researchers, in partnership with the HLPE. The process involves public consultation on the paper outline and the first draft of the paper. The penultimate draft of the paper is reviewed by anonymous reviewers, also drawn from the best experts in the field internationally. The final papers become part of the preparatory material for the CFS meeting and are made

publicly available in the five official languages of the CFS (Arabic, Chinese, French, Portuguese and Spanish). Demand for the papers is escalating, with additional print runs being necessary.

The usefulness of the papers in guiding the CFS deliberations and decisions is evident in the number of HLPE paper recommendations that appear in the final decisions of the annual CFS meetings. This year, the CFS work plan has been modified to provide for the launch of the papers on biofuels and smallholders in Rome in June, to give member states three months to deliberate on the reports in their countries and regions before the CFS meeting in October.

Prof Hendriks counts it a real privilege to have been part of this first HLPE. The team of 15 members was drawn from a short list of 250 nominated experts, following two years of deliberation on the composition of the panel by the CFS Bureau. Each member came from a different country. The panel composition was representative of the regions of the world and range of disciplines covered by food security. The panel was chaired by Prof MS Swaminathan – the first recipient of the World Food Prize.

The HLPE reports are available at <http://www.fao.org/cfs/cfs-hlpe/reports/en/>

## Next-generation sequencing data analysis course hosted at UP

The African Centre for Gene Technologies (ACGT), in collaboration with inqaba biotec and the University of Pretoria's (UP) Institutional Research Theme (IRT) for Genomics, recently hosted two next-generation sequencing (NGS) data analysis workshops.

Participants from all five ACGT partner institutions, as well as the universities of Limpopo and North-West, attended the workshop. An overwhelming response was received locally and from various African countries. A rigorous screening process saw 40 of the most deserving and suitable candidates attend the workshop free of charge at the University. Due to the high demand, two additional training courses were hosted at the Agricultural Research Council during March by Prof Jasper Rees and his team from the ARC Biotechnology Platform. More than

60 researchers participated in the training event at Onderstepoort.

Course presenter and field application specialist Dr Anne Arens from CLC bio headquarters in Denmark conducted the two-day hands-on course. She was joined on the trip by Dr Reinhard Eckloff, Key Account Manager for Europe, Middle East and Africa. The course covered various topics, including de novo assembly, RNA-Seq and miRNA analysis, sequencing tools and microbial finishing modules.

Feedback from the participants indicated that the course was both highly beneficial and

relevant to attendees. The workshops presented the first in a series of bioinformatics training courses hosted by the ACGT and its partners to address specific needs in bioinformatics skills training. For more information on upcoming bioinformatics training events, visit the events page on the ACGT website or like us on Facebook.



Participants attending the CLC bio workshop held in March this year

# Unique weather forecasting training a first for SAWS and UP

Three Meteorology graduates from the University of Pretoria (UP) were the first to successfully complete a newly introduced Certificate Programme in Weather Forecasting offered by the South African Weather Service (SAWS) and Continued Education at UP (CE at UP). The certification ceremony took place at the SAWS at the end of 2012.

The growing demand for, and greater responsibilities required from weather forecasters necessitated the introduction of a new training programme aimed at equipping weather forecasters with more focussed knowledge and skills in their work environment. The South African Weather Service, in collaboration with CE at UP and the Department of Geography, Geoinformatics and Meteorology have therefore introduced a Certificate Programme in Weather Forecasting at the beginning of 2012.



From left: Prof Hannes Rautenbach (Head: Department of Geography, Geoinformatics and Meteorology), with Kate Turner, Christina Thaele and Melisa Lazenby (students who received postgraduate certificates), followed by Phyllis Boshoff (CE at UP) and Dr Winifred Jordaan (Head: World Meteorological Organisation (WMO) Regional Training Centre).

This development is not only strengthening UP's position as the only institution in Africa south of the equator to offer degrees in Meteorology, but is also an important development initiative in the SAWS's new centre of excellence status as a Regional Training Centre of the World Meteorological Organisation. It is expected that student numbers will grow significantly in future with South Africa becoming the country of choice for training and education in Meteorology.



From left: Dr Ousmane Badiane (Director: IFPRI Africa), Dr Godfrey Bahigwa (Director: ReSAKS), Prof Sheryl Hendriks (Director: IFNuW, UP), Prof Anton Stroh (Dean: Faculty of Natural and Agricultural Sciences, UP), Dr Shenggen Fan (Director General: IFPRI) and Prof Johann Kirsten (Head: Department of Agricultural Economics, Extension and Rural Development).

## Joint seminar on global food security

Dr Shenggen Fan, Director General of the International Food Policy Research Institute (IFPRI), presented the IFPRI Global Food Policy Report at a public seminar, hosted by the Institute for Food, Nutrition and Well-being (IFNuW), on 22 April 2013. The report is the second annual report in a new series. It provides a summary of key international events and policy decisions taken during the previous year, as well as important analysis of current issues. Over 10 000 people had downloaded the report in the first two months following the release of the 2012 report in February this year.

Dr Fan sketched the major food policy developments in 2012 and outlined the key policy messages arrived at from IFPRI's analysis of the world food security situation. Among others, these messages were that the global food system remains fragile after the 2008 global food crisis that slowed progress towards the Millennium Development Goals. Productivity growth has also slowed over the past two years, with most increases in food production in Africa, being derived from expanded production, rather than increased production efficiencies. He also emphasised that climate change threatens agricultural growth, but said the more important question is whether we can achieve sustainable agricultural and economic growth. Other issues which he highlighted were that there is growing awareness of the role of gender equality in reducing food insecurity, and also that the proportion of young people is growing – especially in Africa – and that more jobs are urgently needed.

Prof Sheryl Hendriks (Director: IFNuW) concluded the seminar with a brief update on the IFNuW's focus areas and activities, showing the convergence with IFPRI's areas of focus and highlighting the areas of collaboration between the two institutions. This collaboration will be deepened, following discussions between members of the Faculty of Natural and Agricultural Sciences, the IFNuW, the International Food Policy Research Institute and the Regional Strategy for Agricultural Knowledge Systems (ReSAKS).



Renée Hlozek

## Passionate to make Science accessible for all

Fascinated by the burning questions about the universe – its origin, fate and evolution – Renée Hlozek gravitated towards Science at school, in the hope of one day being able to answer them. It seemed destined because, through various programmes, scholarships and natural aptitude, the universe literally opened up to her.

In 2012 she was selected as one of the *Mail & Guardian's* 200 Young South Africans under the age of 35, who are doing extraordinary things. She is seen as a future leader. Renée is currently conducting postdoctoral research in cosmology at Princeton University as a Lyman Spitzer Jr. Postdoctoral Fellow in Theoretical Astrophysics, analysing light originating just 380 000 years after the Big Bang. She is also the Spitzer-Cotsen Fellow in the Princeton Society of Fellows in the Humanities. She was recently named a TED Fellow for 2013, a fellowship which focuses on both her Science and the communication of Science to the public.

Renée kicked off her illustrious career in Science through the \*UP with Science Programme whereafter she completed a BSc degree in Mathematics in 2005 in the Faculty of Natural and Agricultural Sciences at the University of Pretoria (UP). She completed her honours in Applied Mathematics in 2006 at the University of Cape Town, as part of the National Astrophysics and Space Science Programme (NASSP). A master's degree followed suit and her studies were funded by the SKA Human Capital Development Programme. Between 2008 and 2011, as a Rhodes scholar, Renée read for her DPhil in Astrophysics at Oxford University.

Renée recently visited the \*UP with Science programme, which is still flourishing after almost 15 years. She was delighted to meet the current students and gave them a talk about her research. She is also going to work with them in an upcoming science outreach initiative, where learners use video technology to communicate science ideas and questions.

Just as passionate as she is about making Science accessible, as passionate she is about giving back. Therefore she is involved in several outreach programmes, including teaching Mathematics in prisons and Astronomy at schools. "I am passionate about science communication - allowing Science to open the minds of young people. I believe in the power of Science to enthral as well as to educate. I'm passionate about Africa."

Renée emphasised how fascinated she is by our universe – "how it started, how it evolves with time and how it will end!"

\*The UP with Science Programme is a science enrichment programme for senior secondary school pupils, presented by the University of Pretoria. Approximately 50 grade 10 school learners who have a high potential and a keen interest in Science are annually selected to participate in the science enrichment programme. While in the Programme, they are exposed to an enquiry-based approach to Science. It runs over three years, and thereafter the learners may qualify for a full tuition scholarship, valid for most of the study programmes that are offered in the Faculty of Natural and Agricultural Sciences, provided that they meet the normal admission requirements. This Programme includes Saturday meetings once a month and a project week during the holidays, once per year. The Programme is aimed at increasing young people's interest in, knowledge of, and skills in Science.

Visit <http://www.upwithscience.up.ac.za/> for more information on the UP with Science programme.

*Credit: Mail and Guardian, and Renée Hlozek*



# Brains and beauty go together

The lovely Jenni de Bruin, first princess to the RAG Queen of 2013, provides evidence that brains and beauty do indeed go together.

Jenni is a second year Actuarial Science student and loves doing mathematics. Her desire to reach out to others and to make a difference is unmistakable. She has been a tutor in mathematics for a number of years and, not surprisingly, says that learners tend to get attached to her style of tutoring. Her increasingly busy schedule makes it difficult to keep up with this work and she has now resorted to appointing people who work for her. Being a clever business woman is one of Jenni's attributes making her a worthy recipient of the Miss Executive award during the RAG Queen ceremony. She received this award for collecting the most money for charity. Her fund raising projects leading up to receiving this award required thinking innovatively. These projects included a hugely successful morning tea in the Rautenbach Hall and selling cupcakes at male residences. She has adopted three charity organisations – President Kruger Children's Home in Danville, Bramley Children's Home Pretoria and Tsepo ya Bana.

She seems delighted with the opportunities and responsibilities that lie ahead this year. Jenni says the RAG queen of this year and the two princesses get along famously and aim to improve the image of RAG on campus, focusing on the true aim of charity to the community. They plan to make their mark through launching many projects, amongst which is providing a library to a school in Mamelodi. They intend to expand these projects countrywide. They even think of liaising with overseas universities in order to give RAG a boost. Such a charming and brainy first princess is sure to be a role model for many and UP Mathematics can only be proud of their new ambassador.



Jenni de Bruin with Prof Jean Lubuma (Head of the Department of Mathematics and Applied Mathematics).



Faculty overall top achiever, Henry Thackeray and Prof Jean Lubuma (Head: Department of Mathematics and Applied Mathematics).

## Brilliant young scientists awarded at top achievers function

'The importance of passion for science, a willingness to learn, and the need to follow your heart – you may find all of this useful as you find your own path as a young scientist.' These thoughts were shared by Prof Andrew McKechnie, Professor in the field of ecological and evolutionary physiology in the Department of Zoology and Entomology. He was the guest speaker at the annual top achievers function for students of the Faculty of Natural and Agricultural Sciences on 8 May 2013.

Prof McKechnie also reflected on science from a different perspective – that of society's – and left the students to answer the question: 'How will society benefit from your pursuing a career in science?'

Towan Nöthling scooped the most awards at the event. He won two prizes for the best third-year student in Physics, the Department of Physics Prize, as well as the Pierre du Plessis Prize for the best third-year student in Physics with distinction. He also won the Merck Prize for the best achievement in Analytical Chemistry at third-year level, as well as the SASOL Prize for the best achievement in Chemistry at third-year level.

Henry Thackeray did not only receive the Dewald Hattingh Book Prize for the best third-year student in Mathematics, but he also received the Vice-Chancellor and Principal's award as the overall top achiever in the Faculty of Natural and Agricultural Sciences. Henry received his BSc degree in Mathematics with a weighted average performance of 98,74% over the three years of study. He is currently studying towards an honours degree in Mathematics.

More than 50 prizes and trophies were awarded to the top students in the Faculty at this prestigious event. The Faculty is proud to have such outstanding academic achievers and is very grateful to all the sponsors of the prizes and trophies.

# Field trip gives students a new perspective on malaria

Students of the University of Pretoria's Centre for Sustainable Malaria Control (UP CSMC) recently embarked on an adventure field trip to Thohoyandou, Vhembe. This trip provided these students with a new perspective on malaria research and instilled a deeper value, not only for their own research, but also for that of their UP CSMC team members. This is an example of the success of trans-disciplinary research strategies, employed within the Centre, that enables translation of malaria research activities from the bench to the bed.

These students are involved in laboratory oriented malaria research under supervision of Prof Lyn-Marie Birkholtz in the Malaria Parasite Molecular Laboratory (Department of Biochemistry in the Faculty of Natural and Agricultural Sciences) and from the Bioinformatics and Computational Biology Unit. In a community outreach effort, these students visited the UP CSMC field site in a malaria endemic area in Vhembe. The students were hosted by Prof MS Bornman (Extraordinary Professor and Head of Andrology in the Department of Urology at UP) and Dr Kruger (UP School of Health Systems and Public Health). The students assisted in taking samples

of the insecticide impregnated polymer mosquito nets, created by the engineering students in the Centre.

The students also assisted in the interviews with the villagers, who mainly speak Tshivenda. They were kept on their toes by the official interviewer, while they were translating the questionnaire from English to Tshivenda.

Prof Bornman educated the students about the adverse health effects of the use of DDT as pesticide and the importance thereof in the loss of clinically recognised pregnancies in South Africa. Students were also taken on a tour of the Tshilidzini Regional Hospital, where the research is being conducted.

Students are looking forward to returning to Venda later this year, where they will assist in conducting malaria awareness programmes and community building projects. In this way, the UP CSMC Student Forum is contributing towards an interactive platform for shared student activities within the UP, with the aim to expose students to cross-pollination between various fields of malaria control at the University.



Prof Bornman (far left) with the students at the Vhembe Field Office.



Marna, a biochemistry student, having fun with the village children.



Samples of mosi nets.



René Smit

## Geoinformatics student awarded the prestigious Esri Young Scholars Award

# UP student awarded a PhD scholarship for research on climate change

Melissa Lazenby, a former student in the Department of Geography, Geoinformatics and Meteorology at the University of Pretoria, was recently awarded a full scholarship to study in the United Kingdom. The prestigious, fully funded PhD Peter Carpenter African Climate Change Scholarship is awarded to top academic African citizens to build capacity in climate change research and related skills within the continent. This three-year programme, which commenced in 2013, focuses mainly on research and is offered by the Department of Geography at the University of Sussex in Brighton.

The focus of her research will be on the topic of constraining uncertainty in climate change projections. She will be assessing the quantification of uncertainty in African climate projections with a view to achieving better decision making in the future with regard to natural resources and the environment. Due to the frequent occurrence of extreme events in the African region, the impact of these types of events and their effect on natural resources and the environment will also be assessed. All time scales will be assessed using various climate models to quantify the magnitude of these uncertainties and to determine their possible causes.



Landing page of the "Hiking Through GIS" game

A screen shot from the Hiking Through GIS

René Smit, a BSc(Hons) student in Geoinformatics, won the Environmental Systems Research Institute, Inc (Esri) Young Scholars Award for her third-year project. The Esri Young Scholars Awards are an Esri initiative to showcase the work of up-and-coming scholars in the geospatial field.

René entered a digital game, "Hiking through GIS", which she developed as part of her undergraduate project. To be considered for this award, students were required to submit a full-text academic article to Esri South Africa.

The top articles will be published on the Esri South Africa website (<http://www.esri-southafrica.com>).

As the winning Young Scholar, René will be presenting her article at the Esri International User Conference in San Diego, USA, in July 2013. During the Special Achievement in GIS Award ceremony, she will formally receive the Young Scholars Award. René's work will also be displayed in the Esri Map Gallery.



Melissa Lazenby

# Information day bridges gap between theory and application

In March the Department of Agricultural Economics, Extension and Rural Development organised an information day on the University's experimental farm, as an initiative to improve the pass rate of two subjects in the Department – Introduction to Financial Management in Agriculture (LEK 251) and Introduction to Agricultural production Economics (LEK 252).

The idea was to expose students to on-farm economic and accounting principles, as well as to bridge the gap between economic theory and application in the agricultural milieu. The day resulted in a huge success because of a collaborative effort by the whole Department .

Due to the large number of students enrolled for LEK 251 and LEK 252, the class was divided into fifteen smaller groups, which rotated around different information and game stations. These were placed at various enterprises on the experimental farm. Each group received a map of the experimental farm and a questionnaire, covering economic concepts in agriculture, designed specifically to reinforce their learning experience. The stations on the experimental farm were organised by staff from the Department, who interacted with students, and explained the economic and accounting principles in an active farm enterprise. Students had the opportunity to engage with the staff and to ask questions. The overall response from the students was that they learned many new things. The day came to an end with a braai at the Balsaal, where a winning group, based on the completed questionnaire, received a prize, sponsored by Syngenta.

The students expressed their gratitude towards Mr Roelf Coertze and the experimental farm staff, staff from the Faculty of Natural and Agricultural Sciences, as well as Syngenta for the support and assistance in making the day a success. We are looking forward to hosting the group of 2014!



Students from the Department of Agricultural Economics and Rural Development enjoyed themselves during an information day on the experimental farm.



The winning group!



The nine FameLab finalists: Febé Wilken (runner-up), Barend Jansen van Vuuren, Christopher Maxwell, Ntokozo Shezi, John Woodland (runner-up), Ahmed Seedat, Charlotte Hillebrand, Michelle Knights (overall winner) and Charmaine Drury.

# Think of science in a different way

'FameLab forced me to stretch my imagination and taught me to think about my science in a different way. It has completely changed the way I communicate,' said Febé Wilken, a final-year MSc student in plant biotechnology and volunteer at the University's science centre, Sci-Enza, after coming third in the first-ever FameLab South Africa competition.

The 1 000-seat Guy Butler Auditorium in the 1820 Settlers National Monument was completely sold out for the FameLab South Africa 2013 final, hosted during the national science festival, Scifest Africa, in Grahamstown during March this year. Nine finalists presented a range of interesting and diverse three-minute scientific talks to a lay audience.

Michelle Knights, a cosmology student from Cape Town, was named the first South African FameLab winner. She received a R10 000 cash prize, as well as a trip to the United

Kingdom (UK) to compete in the FameLab International final in June 2013. The second place was awarded to John Woodland, also from Cape Town, and the University of Pretoria's own Febé Wilken won the third place.

Barend Jansen van Vuuren, an MSc student in genetics, also made the University proud by being selected as one of the nine finalists during the regional heats in Johannesburg and participating in the finals.

The event, presented by Jive Media Africa in collaboration with the British Council, generated much excitement and brings new perspectives on science and science communication to South Africa. FameLab

has been called '*Pop Idols for scientists*', where contestants have to explain a scientific topic in a manner that anybody can understand and relate to it.

The Competition was started in 2005 in the UK by Cheltenham Science Festival and has successfully identified, trained and mentored young scientists to share their enthusiasm for their subject with the public.



# Prize for geology graduate



Justice Keletso Kgarume with Andy Clay

Justice Keletso Kgarume, of the Department of Geology in the Faculty of Natural and Agricultural Sciences, was recently awarded a cash prize of R1 000 for being the best geology honours student to attend Venmyn Deloitte and UP's annual Compliance and Reporting Rules in the Minerals Industry course.

The prize was awarded by Venmyn Deloitte MD Andy Clay at a ceremony at Willemsse Hall, at the Department of Geology. 'It is encouraging when students begin to appreciate the contents of the course, which links

technical, valuation and compliance issues,' says Clay.

Kgarume was one of the approximately 30 students who participated in the course, which was also attended by external delegates.

He is most interested in coal geology, having completed his honours research report on the effect of weathering on coal qualities and properties. He found no relationship between the hammer test and calorific value, ash content, volatiles and moisture content in coal. He is considering starting an MSc in geology this year.

## Successful Mathematics Experience Day

In February the University of Pretoria hosted a Mathematics Experience Day as the opening event of the Siyanqoba Regional Olympiad Training Programme for 2013.

The Siyanqoba Regional Olympiad Training Programme is a prestigious mathematics Olympiad training programme for mathematically gifted and motivated high school learners. It is coordinated at a national level by the South African Mathematics Foundation (SAMF) and is sponsored by the Department of Science and Technology. Nationally there are fourteen regional centres for the programme. The University of Pretoria is the regional centre of the programme for the Gauteng North region.

Erica Hertzog helped recruit 186 mathematically strong learners from around 19 schools in the Greater Pretoria area who attended the afternoon programme. After some practice questions given to them by Dr Ruan Kellerman, the learners wrote a short Olympiad, which will be used as a selection test for inclusion in the Siyanqoba programme. While Prof Ansie Harding gave a popular talk on fractals, titled 'Smaller and Smaller and Smaller', four of the Department's teaching assistants Aderogba Adebayo Abiodun, Shitu Hassan, Adera

Kachienga and Collen Motsepa marked the Olympiad answer sheets.

The three highest scoring learners from each grade received prizes and a number of Mathematics books were handed to the Phateng Secondary School.

The event was well received by the learners, their parents, and teachers.



Learners and their parents at the Mathematics Experience Day