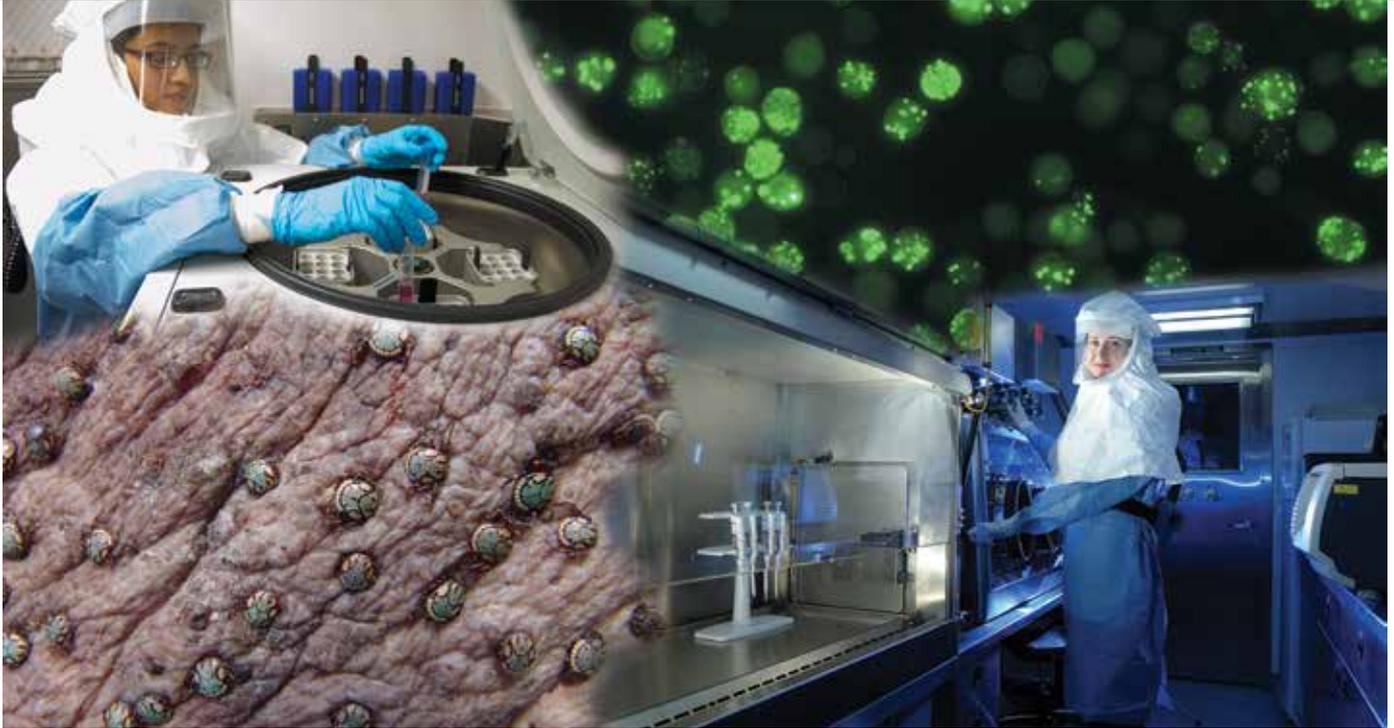


SQUARED² UP

Newsletter of the Faculty of Natural and Agricultural Sciences ■ Issue 2 ■ Nov 2013



Unique group of scientists focus on animal and human health

Of the more than 1 400 pathogens (micro-organisms that can cause disease) that affect humans, about 60% are zoonotic, indicating that the disease can be transmitted from wild and domestic animals to humans. On average, the emergence of new diseases occurs every eight months, of which more than 70% originate as animal diseases.

Animal health has become increasingly important and is inextricably linked to our local and global

economy as well as societal issues such as public health, food and food security. The overlap in veterinary, human and ecological health sciences requires a collaborative research effort of multiple disciplines to attain optimal health for people, animals and our environment.

The University of Pretoria (UP) launched its Institutional Research Theme (IRT) on Animal and Zoonotic Diseases (AZD) on 28 October 2013. With these research themes, the

University is consolidating its traditional research strengths by supporting the development of multidisciplinary IRTs. The themes are directed at fostering a more collaborative approach within the institution, as well as among other academic institutions, private enterprises and government.

The AZD-IRT will strengthen UP's current research capacity in animal diseases. This includes diseases that spread from animals to humans (zoonosis). A total of 22 principal

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Faculty of Natural and Agricultural Sciences

Strengthen research to its fullest capacity



As part of its future vision the Faculty of Natural and Agricultural Sciences (NAS) fully endorses the strategic goals of the University. In order to achieve these goals with their associated longer term targets, the Faculty needs to sharpen its focus, especially on excellence. One of these goals is to become a research intensive university in the next five years.

The Faculty, as one of the top faculties of sciences in the country, already contributes significantly to research and postgraduate education and with the launch of the **Animal and Zoonotic Diseases Institutional Research Theme (AZD-IRT)** further research initiatives will be stimulated between the faculties of Veterinary Science, Health Sciences and NAS (page 1).

As research is part of the Faculty's core business, the official launch of the South African Research Chairs Initiative in **Mathematical Models and Methods in Bioengineering and Biosciences (M³ B²)** is also of great significance (page 4).

One of the interesting research projects in the Faculty is the **Tree Protection Co-operative Programme**, based at FABI, which recently received permission from the Department of Agriculture, Forestry and Fisheries and the Department of Environmental Affairs to release the parasitic wasp, *Cleruchoides noackae* (*Mymaridae*), for the biological control of the Bronze Bug (page 18).

Prof Robert (Bob) Millar, Director of the MRI not only published his research in over 400 internationally peer-reviewed journals, but he also recently published an article in the prestigious journal, *Nature* (page 12).

As always, we are very proud of the outstanding achievements of our staff in the Faculty. **Prof Mike Wingfield**, Director of FABI, was earlier elected to serve as the next President of the International Union of Forestry Research Organisations (page 8). **Prof Sheryl Hendriks** is one of only three experts from Africa, appointed to the Committee for World Food Security High Level Panel of Experts for Food Security and Nutrition (page 13).

Prof Tim Clutton-Brock, a leading behavioural ecologist whose research embraces the broad fields of behavioural ecology, evolutionary ecology and population ecology, received an honorary doctorate in Science during the Spring graduation ceremony (page 6).

The Faculty recently recruited and appointed a number of internationally acclaimed, high profile researchers and academics to further improve the reputation and high academic standing of the Faculty. These include, **Profs Zoubos, Vogel, Booth, Schubert, Raftery and Abass** (pages 30-33). **Prof Marietjie Potgieter** was appointed as the Deputy Dean: Teaching and Learning and **Prof Brenda Wingfield** was elected as the Deputy Dean: Research and Postgraduate Studies for a second term (page 28). Two new Heads of Departments, **Prof Andriëtte Bekker** (Statistics) and **Prof Roumen Anguelov** (Mathematics and Applied Mathematics) were also appointed (page 29).

Our students also performed very well. **Leandri van der Wat**, an MSc student in Analytical Chemistry was the runner-up in the 2013 MasterChef South Africa competition (page 49). **Henry Thackeray**, a BSc Mathematics (honours) student was appointed as principal candidate for the 2014-2015 Fulbright Foreign Student Program for study in the United States (page 45).

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 achievements and we hope that you will enjoy this update on the latest developments in our Faculty. We wish you all well for the festive season that lies ahead and trust that you will return refreshed in 2014.

Prof Anton Ströh

Dean: Faculty of Natural and Agricultural Sciences

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investigators across nine different departments in the faculties of Veterinary Science, Natural and Agricultural Sciences as well as Health Sciences are involved. As the only university in South Africa with a Faculty of Veterinary Science, UP is uniquely placed to provide research capacity across the whole of the animal disease research chain and play a leading role in the control of animal and zoonotic diseases. The IRT can also make a major contribution to the recently established Tshwane Animal Health Bio cluster.



Prof José de la Fuente from Oklahoma State University was the guest speaker during the launch of UP's new Institutional Research Theme for Animal and Zoonotic diseases.



From left: Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences), Prof Stephanie Burton (Vice-Principal: Research and Postgraduate Studies), Prof José de la Fuente (Oklahoma State University), Prof Cheryl de la Rey (Vice-Chancellor and Principal), Prof Henk Huisman (Director: Animal and Zoonotic Diseases IRT), Prof Gerry Swan (Dean: Faculty of Veterinary Sciences) and Prof Eric Buch (Dean: Faculty of Health Sciences)



Prof Henk Huisman (Director: Animal and Zoonotic Diseases IRT)

Synergy between biology and mathematics culminates in launch of new SARChI Chair

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

The official launch of the South African Research Chairs Initiative (SARChI) Chair in Mathematical Models and Methods in Bioengineering and Biosciences (M³ B²) on 25 October 2013 was the culminating point of a strategic initiative of the Department of Mathematics and Applied Mathematics in 2007 to work closely with the current cluster of Biological Sciences at the University. Prof Jean M-S Lubuma, a renowned mathematician, the former Head of the Department of Mathematics and Applied Mathematics, was appointed to lead this prestigious Research Chair.

Prof Carlos Castillo-Chavez from the Arizona State University, whose research programme is also focused on the interface of the mathematical and natural and social sciences delivered the keynote address at the launch. To complement the launch, a Biosciences and Bioengineering mini-conference was held on 28 October where

renowned speakers such as Prof Michael S Pepper from the Institute for Cellular and Molecular Medicine and Department of Immunology of the University of Pretoria and Prof Carlos Castillo-Chavez delivered topical addresses.

At the launch, the Vice-Principal for Research and Postgraduate Studies, Prof Stephanie Burton and Prof Lubuma, emphasised that the Chair will contribute to the implementation of UP strategic plan and vision for 2025 of being a leading research-intensive university.

"This is a golden opportunity for the Department of Mathematics and Applied Mathematics, as a base department, to become research-intensive by 2016, as expected in the University strategic plan. The vision for the Chair is indeed to become an international centre of excellence in mathematical biology, which will emphasise aspects, such as extensive international and local collaborations, including multidisciplinary research with some of the University's Institutional and Faculty Research Themes as well as focussing on research areas of our strengths," Prof Lubuma said.

According to Prof Lubuma, the research focus of this Chair in M3 B2 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 considered within the Chair are highly relevant to the needs of the country. These include mathematical epidemiology, specifically the identification of adequate scientific, engineering - or medical responses to new diseases and old forms of new diseases, such as malaria, tuberculosis, cancer, HIV/AIDS and other communicable diseases that pose a massive threat to development in South Africa and beyond.

Some of the research milestones in this field at the University include two successful workshops on mathematical epidemiology in 2008 and 2010, fruitful collaborations with the Bulgarian Academy of Sciences and the French International Centre of Agricultural Research for Development as well as the Biomath Forum launched in 2011 as an interdisciplinary research gathering for the exchange of ideas between mathematicians and biologists at the University. More recently the Biomath Coffee was established as an informal weekly meeting.

Another interesting initiative in this Chair is the "Under-Twenty Mathematicians" (UTM) programme. This programme is aimed at identifying, recruiting and grooming young South African citizens to become mathematicians, a category that dominates the national scarce skills list.



From left: Prof Jean Lubuma, Prof Carlos Castillo-Chavez (Arizona State University) and Prof Roumen Angelov (Head: Department of Mathematics and Applied Mathematics).



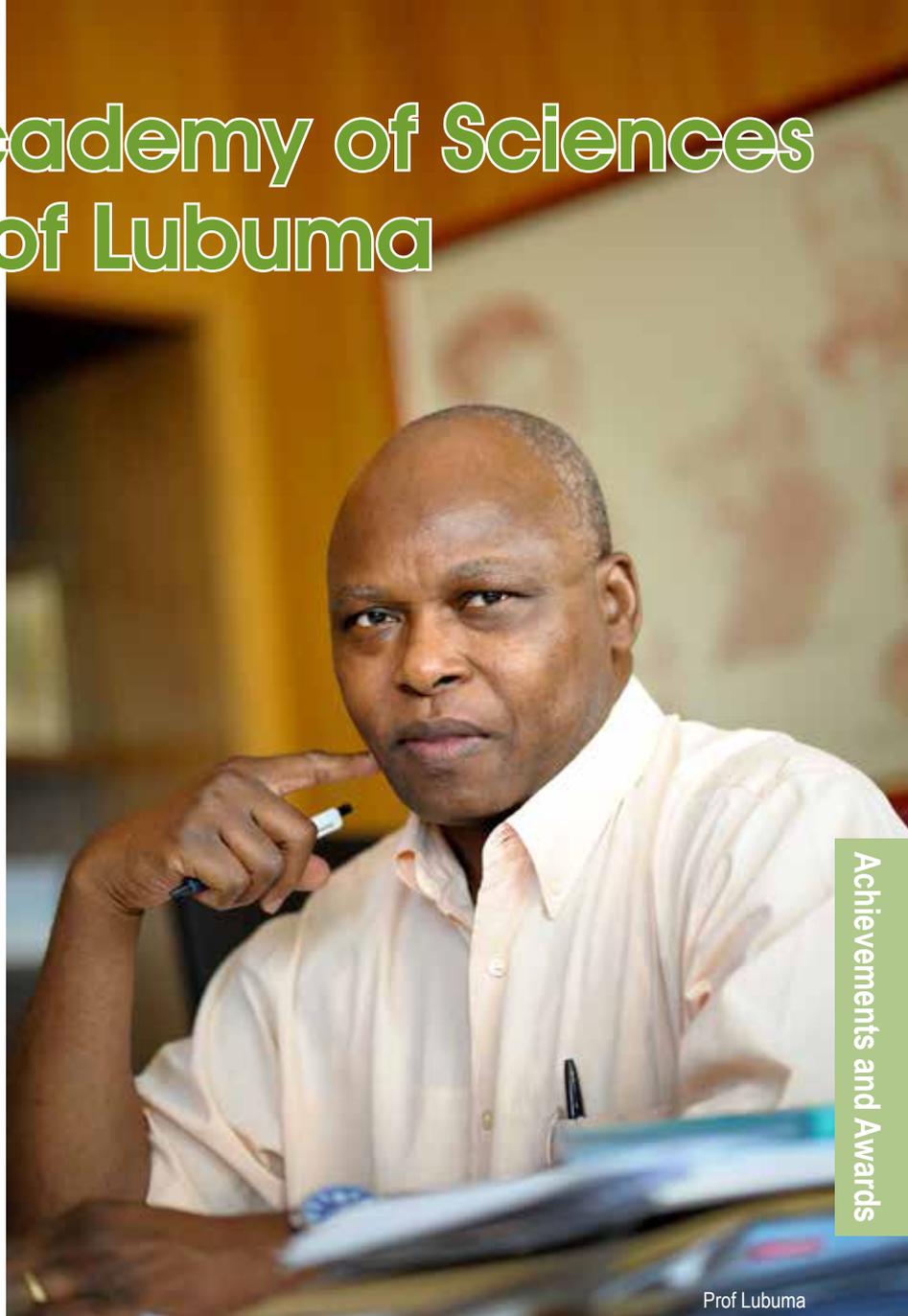
Prof Jean Lubuma and Prof Stephanie Burton (Vice-Principal: Research and Postgraduate Studies).

Bulgarian Academy of Sciences honoured Prof Lubuma

The Bulgarian Academy of Sciences recently awarded the Sign of Honour to Prof Jean Lubuma for his contribution to the development and strengthening of the research collaboration between the Bulgarian Academy of Sciences and the University of Pretoria (UP). He was acknowledged in particular for his contribution to the organisation of the International Conference on Mathematical Methods and Models in Biosciences (BIOMATH).

Prof Lubuma served as the Head of the Department of Mathematics and Applied Mathematics for many years and is currently heading the SARChI Chair in Mathematical Models and Methods in Bioengineering and Biosciences.

The Sign of Honour was awarded to Prof Lubuma at an official ceremony held in Sofia earlier this year. During this ceremony Prof Sendov, full member of the Academy, highlighted the contribution of Prof Lubuma to Mathematics and to the joint research initiatives between UP and the Bulgarian Academy of Sciences. Prof Sendov also emphasised the need to explore further opportunities for research collaboration between these two institutions and the two countries. In a lighter spirit he also remarked: "Considering the contemporary means of communication, sharing a time zone (which the two countries do) might be more advantageous than sharing a hemisphere (which they do not)."



Achievements and Awards

Prof Lubuma

Two UP professors elected to International Society for Plant Pathology



Prof Lise Korsten and Prof Brenda Wingfield.

At the recent International Society for Plant Pathology (ISPP) meeting in Beijing it was announced that two South Africans (both from the University of Pretoria's Faculty of Natural and Agricultural Sciences), Prof Brenda Wingfield and Prof Lise Korsten were elected to the ISPP Executive Committee. Their term of office is from 2013 until 2018.

Prof Wingfield was elected as the Secretary General while Prof Korsten as the Global Food Security Task Force Chair of the ISPP. The International Society for Plant Pathology promotes the world-wide development of plant pathology and the dissemination of knowledge about plant diseases and plant health management. The Society also sponsors the International Congress of Plant Pathology (ICPP) at regular intervals and other international meetings on plant pathology and closely related subjects. The Society establishes committees to consider and report on special fields or problems in plant pathology. The Society organises other activities including the publication of journals newsletters and websites, as approved by the Executive Committee.



From left: Prof Chris Chimimba (Head: Department of Zoology and Entomology), Prof Nigel Bennett (SARChI Chair of Mammalian Behavioural Ecology and Physiology), Prof Wiseman Nkhulu (UP Chancellor), Dr Dafila Scott (Prof Clutton-Brock's wife), Prof Tim Clutton-Brock and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences).

Dedicated zoologist receives Honorary Doctorate in Science from UP

A dedicated zoologist received an honorary doctorate in Science from the University of Pretoria during the Spring graduation ceremony.

Professor Tim Clutton-Brock is a leading behavioural ecologist whose research embraces the broad fields of behavioural ecology, evolutionary ecology and population ecology. He has been an Extraordinary Professor at the University of Pretoria's Mammal Research Institute (MRI) for the last ten years. He conducted extensive individual-based field studies on red deer, Soay sheep, Kalahari meerkatte, banded mongooses and pied babblers.

Early in his career, Prof Clutton-Brock introduced the use of quantitative comparisons to establish how species differences in behaviour and life-history parameters vary in relation to ecology – an approach he uses to test ecological and evolutionary hypothesis. However, he is best known for having developed long-term, individual-based field studies of free-ranging animals in their natural habitats, up to the point where it is possible to track breeding success and survival of large samples.

Prof Clutton-Brock plays an important role in training field ecologists, with over 300 interns having passed through his long-term field projects. He has received many accolades in his field, and has provided the general public with a popular introduction to the social behaviour of animals.

Prof Clutton-Brock said that his career as a zoologist, interested in mammals, naturally drew him to Africa, describing the continent not only as the cradle of hominid evolution, but also as a habitat for many large mammals. "South African universities and scientists are at the forefront in this area," Prof Clutton-Brock commented. "The University of Pretoria continues to be the principal centre of research on mammal biology. The MRI grew from a small unit, concentrating on the taxonomy of small mammals to an internationally recognised centre of research that produces a large number of ground-breaking publications each year."

Elsevier Award for Consumer Science staff

The 2013 Elsevier Award for the most innovative research was recently presented to Prof Alet Erasmus, Dr Sune Donoghue (both from the Department of Consumer Science at the University of Pretoria (UP)) and Prof Thomas Dobbelstein (Cooperative State University of Baden-Württemberg, Ravensburg, Germany). They received the award for their research paper titled *Consumers' perception of the complexity of selected household purchase decisions*, at the 20th European Conference on Recent Advances in Retailing and Consumer Services Science (EIRASS) held in Philadelphia, USA, earlier this year.

What makes this award noteworthy is that it was won by researchers in Consumer Science, while the conference predominantly attracts scholars in the fields of Marketing and Retail. The collaboration between Prof Erasmus, Dr Donoghue and Prof Dobbelstein was initiated at the 2012 EIRASS Conference in Vienna, Austria, which had a very rewarding outcome.

This study aimed to expand consumer behaviour literature in a Third World context through empirical evidence of consumers' perception of the complexity of a variety of product / service

decisions which the majority of households are confronted with from time to time. The investigation aimed to indicate how consumers' perception of the complexity of purchase decisions is influenced by demographic factors and how it is mediated by consumer risk perception.

Major household appliances are perceived as relatively complex purchase decisions which involve functional / performance, physical, psychological, social and financial risk across most consumer sectors. Based on this evidence, a washing machine purchase was used as an anchoring purchase decision and a selection of products and services were categorised on a continuum of complexity, relative to a washing machine purchase. Findings confirmed the possibility to align product decisions on a complexity continuum. Outcomes pertaining to consumer risk perception provided valuable insight in terms of consumer perception of the complexity of purchases. Colleagues of the Department of Statistics at UP, specifically Dr Nina Strydom and Ms Jaqui Sommerville were involved in the initial data analysis. An article, based on the research, will be published in the *Journal of Retailing and Consumer Services*.



From left: Prof Thomas Dobbelstein (Cooperative State University of Baden-Württemberg, Ravensburg, Germany), Prof Harry Timmermans, Prof Alet Erasmus and Dr Sune Donoghue.

FABI Director elected as next President of IUFRO

Prof Mike Wingfield, the Director of the Forestry and Agricultural Biotechnology Institute (FABI) in the Faculty of Natural and Agricultural Sciences, was elected early in June 2013 to serve as the next President of the International Union of Forestry Research Organisations (IUFRO). He is the first ever African to be elected to this

was established in 1892 and is a member of the International Council for Science (ICSU).

Prof Wingfield has been an active member of IUFRO for more than 30 years. He has served in many positions in the organisation, among others as the Coordinator of Division 7 (Forest

papers and five books. As an invited speaker he has made numerous highly acclaimed presentations globally. Prof Wingfield has been elected as a fellow of several scientific societies, including the Royal Society of South Africa, the Academy of Science for South Africa (ASSAf), the Southern African Society for Plant Pathology and the American



Prof Mike Wingfield

prestigious position, which has a five-year term running from October 2014 to 2019.

The IUFRO is 'the global network for forestry research' and one of the most influential organisations dealing with forestry and linking forest scientists throughout the world. As an international non-profit, non-governmental network it promotes global cooperation in forest-related research and enhances the understanding of the ecological, economic and social aspects of forests and trees. It also unites more than 15 000 forestry scientists from more than 110 countries globally. The organisation

Health). For the past four years he has been the Vice-President responsible for the nine divisions of the IUFRO. He has worked in forestry, in particular in the area of forest protection, since his student days and has a passion for protecting these vitally important ecosystems. When Prof Wingfield, with his international scientific reputation, takes on his new role, backed by an extensive network of forest scientists in IUFRO, it will be the start of a new and exciting era for the IUFRO, and especially for the African continent.

His work on the topic of tree health has been widely published in more than 600 research

Phytopathological Society. He is one of the few honorary members of the Mycological Society of America.

The prestigious African Union (AU) Kwame Nkrumah Scientific Award in the Life and Earth Sciences category was bestowed on Prof Wingfield in Addis Ababa in May this year, and other accolades that he has received include the Johanna Westerdijk Award, awarded by the Centraalbureau voor Schimmelcultures (CBS) (Fungal Biodiversity Centre, the Netherlands), and honorary DSc degrees from the University of British Columbia in 2012 and the North Carolina State University in 2013.



Prof Ignacy Cukrowski

International Excellence Award for Prof Cukrowski

Prof Ignacy Cukrowski, a Full Professor in the Department of Chemistry in the Faculty of Natural and Agricultural Sciences recently received the International Society of Electrochemistry's (ISE) Excellence Award: Teaching and Research.

The award was presented by the South African Region of the International Society of Electrochemistry at the gala night of the 13th Topical Meeting of the ISE. Prof Ignacy Cukrowski received this award in recognition of his exceptional contribution to the advancement of Environmental Electrochemistry and Electro catalysis in South Africa.

Prof Cukrowski has twice been recognised as an Exceptional Academic Achiever by the University of Pretoria, the first being in 2008.

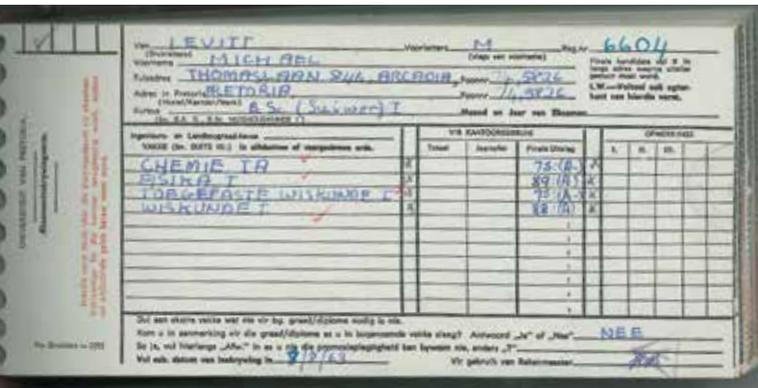
For his PhD (completed at the Marie Curie-Skłodowska University, Lublin, Poland, and which led to numerous patents and publications) Prof Cukrowski designed, built, tested, and optimised a unique voltammetry system with a built-in self-controlling digital logic for ultra-trace analysis on eight channels (working stations) with specially designed electrode systems working in a

parallel mode. In 2001 he attained the DSc (Habilitation) from the Nicolaus Copernicus University, Torun, Poland, based on results from his work at the University of the Witwatersrand (Wits).

Prof Cukrowski is the founder and was for ten years, first president of the Electrochemical Society of South Africa and organised several national and international conferences. He is a member of the South African Chemical Institute. Prof Cukrowski established electrochemistry research laboratories at both Wits and UP. He has supervised about 30 MSc, PhD and postdoctoral fellows, published over 80 papers in, and refereed for, 12 international journals. He has delivered over 20 invited plenary and keynote lectures, presented more than 30 seminars and given at least 110 conference presentations across the globe.

He was the project leader of numerous research projects organised by amongst others, the NRF, the Technology and Human Resources for Industry Programme (THRIP), the Pebble Bed Modular Reactor (PBMR) project, Sasol, Anglo-American and Chrome International. He is an NRF C-rated scientist.

Nobel laureate recollects UP's contribution to his scientific career



A copy of Prof Michael Levitt's final results from 1963.

A winner of the 2013 Nobel Prize in Chemistry started his academic career at the age of 15 at the University of Pretoria (UP) in Afrikaans. Much has been said about Prof Michael Levitt since he was named joint winner of the prestigious international award, but nowhere has it been mentioned that there is a small gap in the CV of the American-British Israeli biophysicist and professor in structural biology at Stanford University in the United States.

Prof Levitt's work focuses on theoretical, computer-aided analysis of protein, DNA and RNA molecules responsible for life at its most fundamental level. In October 2013 – after being inundated with communications and congratulations – he confirmed that he spent his first year at university at UP half a century ago.

"I was a keen student and happy to be at a university where the lecturers not only lectured, but also responded to and nurtured their students. I was introduced to adult learning when I was quite young and I have no doubt that my first year at UP contributed to my store of scientific knowledge," Prof Levitt said in an email to UP's Media Office.

The fact that Prof Levitt spent the year of 1963 studying maths, chemistry and physics was brought to the University's attention by his mother, Ms Gertrude Levitt (98). She wrote to UP to thank Prof Wolfgang Schilz, a previous head of the Department of Chemistry at UP, for the contribution

he had made to her son's career. Ms Levitt wrote that due to his boredom in the classroom, her son passed his Matriculation Examination at the age of 15 after he was tutored privately. She wanted to send him to an English university, but they were not prepared to enrol such a young student.

"I then went to see Prof Schilz and told him of the difficulties I was experiencing. He gave me a sympathetic hearing and after meeting Michael immediately accepted him to start at Tukkies," Mrs Levitt said.

In his email, Prof Levitt said that he was interested in investigating and experimenting from a very early age. "As I became older science became, and has remained, my overwhelming interest and passion."

Prof Levitt passed all his subjects in his first year with distinction. He was also offered a bursary. He did not, however, continue his studies at UP as his mother moved to London to be closer to her brother. There Prof Levitt attended Kings College and obtained a degree in physics.

Shortly after winning the Nobel Prize, his mother wrote to UP: "We would be grateful if you could contact Prof Schilz to tell him what Michael has accomplished and how much I appreciate and thank him for acting on his hunch that this boy was worth helping and also give him our best wishes."



The class of 1963 where Prof Michael Levitt studied at UP

Prof Don Cowan receives an A-rating from the National Research Foundation



Prof Don Cowan

Prof Don Cowan, an international researcher of note and the Director of both the Institutional Research Theme in Genomics and the Centre for Microbial Ecology and Genomics (CMEG), recently received an A-rating from the National Research Foundation (NRF).

Prof Cowan was educated in New Zealand, at the University of Waikato and completed a period of postdoctoral study there before moving to University College, London as a lecturer in 1985. After 16 years in London, he accepted the position as Professor of Microbiology in the Department of Biotechnology at the University of the Western Cape, Cape Town, where he was a senior Professor and Director of the 60-person strong Institute of Microbial Biotechnology and Metagenomics. Prof Cowan joined UP in May 2012.

He has published over 220 research papers, review articles and book chapters, and sits on the editorial boards of ten international journals.

Some of the achievements on Prof Cowan's impressive CV include the post of Adjunct Professor at the University of Waikato (NZ), being elected as a Fellow of the Royal Society of South Africa in 2007, as a Member of the Academy of Sciences of South Africa in 2008, and as an Honorary Fellow of the Royal Society of New Zealand in 2009. He was awarded the University of the Western Cape Vice-Rector's Award for Research Excellence in 2008 and the South African Society for Microbiology Silver Medal in 2009. Currently he is President of the Royal Society of South Africa.

Prof Cowan's research activities are linked by the theme of environmental extremes. Since his PhD studies, he has retained an interest in the ecology and enzymology of extreme thermophiles, organisms living at the temperature of boiling water. For the past decade he has worked at the other end of the temperature scale with New Zealand, Chinese and American scientists, studying the microbial ecology and metagenomics of the Dry Valleys of Eastern Antarctica. He collaborates with Ethiopian and Norwegian researchers to study organisms in the alkaline Rift Valley lakes, with South African and Spanish researchers on bacteria in high salt environments and with a network of local and international researchers on the microbial ecology of hot deserts.



Prof Robert (Bob) Millar

Prof Millar won NSTF-BHP Billiton Award

Prof Robert (Bob) Millar, Director of the Mammal Research Institute and the Medical Research Council (MRC) Receptor Biology Unit is the proud recipient of one of the National Science and Technology Forum (NSTF) Awards for 2013. The annual awards are hosted in partnership with BHP Billiton.

Prof Millar received the Lifetime Achiever Award to an individual for his outstanding contribution to Science, Engineering, Technology and Innovation (SETI) during his lifetime. He made numerous discoveries which were translated into effective treatments for reproductive diseases and cancers. One of his more significant contributions was

the development of Triptorelin – a locally developed hormone agonist used in the treatment of prostate cancer or breast cancer. His research was published in nearly 400 internationally peer-reviewed journals.

Two other UP scientists were also winners of NSTF Awards, sponsored by the National Research Foundation (NRF). These were the TW Kambule Award for individuals who made an outstanding contribution to SETI through research and its outputs over the last five to ten years. The first recipient was Prof Marietjie Venter, Director of the Zoonosis Research Unit at UP, and also Director of the Centre for Respiratory Diseases and Meningitis at the

National Institute for Communicable Diseases in Johannesburg. The second recipient was Prof Saurabh Sinha, Director of the Carl and Emily Fuchs Institute for Microelectronics at the University.

This year a total of eight UP scientists were finalists for the NSTF-BHP Billiton awards. Prof Cheryl de la Rey, Vice-Chancellor and Principal, congratulated them earlier, reiterating that it is a great honour to be a finalist or winner of these awards. "All these scientists made an outstanding contribution to Science, Engineering, Technology and Innovation in South Africa."

UP food security expert appointed to international panel

Prof Sheryl Hendriks, Director of the Institute for Food, Nutrition and Well-being and associate professor of Food Security in the Department of Agricultural Economics, Rural Development and Agricultural Extension is one of only three experts from Africa, appointed to the Committee for World Food Security (CFS) High Level Panel of Experts for Food Security and Nutrition (HLPE). The other two are from Niger and Kenya.

Prof Hendriks is one of 15 world-class experts nominated by their countries and selected from over 240 international nominations to serve on the HLPE from October 2013 until October 2015. This is her second appointment to the Panel. The announcement was made at the CFS annual meeting in Rome where two HLPE papers were presented (*Biofuels and Food Security* and *Investing in Smallholder Agriculture for Food Security*).

The CFS is the central international and intergovernmental platform for food security and nutrition, where policies can be developed, interventions co-ordinated, options shared and decisions at different levels can be prepared. The HLPE was established in 2010 to guide CFS decisions.

The CFS identified two controversial issues each year that the HLPE is commissioned to prepare papers on for discussion at the following CFS annual meeting of its 193 United Nations member countries. This enables the direct translation of scientific evidence into policies and programme interventions in the member countries.

The HLPE aims to help CFS to better understand the diversity of issues and rationales when dealing with food and nutrition insecurity. As an independent

opinion, it strives to clarify contradictory information and knowledge, elicit the backgrounds and rationales of controversies, and identify emerging issues. The HLPE organises a scientific dialogue, built upon the diversity of disciplines, backgrounds, knowledge systems, diversity of its teams, and open e-consultations.



Prof Sheryl Hendriks

Prof Hendriks leads the University's Institutional Research Programme on food security, consolidating this strategic research area. It brings together top researchers from over 25 University departments to address complex and complicated food security issues of significant relevance to South Africa. She served on three Technical Review Committees of the Global Agriculture and Food Security Programme, led the development of the Comprehensive African Agricultural Development Programme (CAADP) Framework for African Food Security and led the first CAADP technical reviews of national and regional investment plans. She is an active research leader in trans-disciplinary food security research and is also facilitating the South African CAADP process.

Prof Hendriks' research focuses on understanding household food insecurity and hunger and evaluating the impact of food policy and food security interventions in Africa. She has a special interest in the identification of food security indicators and institutional arrangements for food policy. Prof Hendriks consistently publishes on food security and food policy issues. She has made a significant contribution to building Africa's capacity for food security analysis through supervision and training of students from 18 African countries.

Biotech Fundi Awards for capacity building and best student



Prof Dave Berger

Two staff members of the Forestry and Agricultural Biotechnology Institute (FABI) in the Faculty of Natural and Agricultural Sciences recently received Biotech Fundi Awards. Prof Dave Berger won the Biotech Fundi Award for capacity building, while Eshchar Mizrachi won the Best Student Award.

The Gauteng Department of Agriculture and Rural Development (GDARD), in partnership with The Innovation Hub, hosted the third Biennial Biotech Fundi Awards, recognising the biotech community of Gauteng. The awards brought together various biotechnology role players and stakeholders, with the sole objective of recognising achievements and excellence in the sector.

Prof Berger is well-known in Plant Biotechnology circles in South Africa. His research programme is internationally recognised and he has an excellent record of publications in highly rated scientific journals. In addition, Prof Berger has trained a number of master's and PhD candidates and he has also directly engaged with Biotechnology industries. He has an active research programme which will also result in tangible benefits to the South African Biotechnology Industry. This is evidenced by patents and knowledge that has already impacted on these industries' activities.

As a consequence of the fact that Prof Berger's research is engaged across the technology pipeline, the postgraduate students he has trained are sought after in the Biotechnology sector. Prof Berger has not only trained excellent researchers, but for a number of years has also run a micro array workshop. In so doing, he has trained large numbers of researchers to use this technology, many of whom are now working in the biotechnology industry. This workshop has therefore provided hands-on training in an important technology that has far reaching applications across the biotechnology industry sector. Through this workshop, Prof Berger has directly contributed to capacity building in a technology that adds direct value to the South African Biotechnology Industry.

Eshchar Mizrachi received the Biotech Fundi Award in the category Best Student. The prize includes a training course with DNABiotech, to the value of R10 000, as well as a sponsored trip to the 2014 Agricultural Biotechnology International Conference (ABIC) in Saskatoon, Saskatchewan Province (Canada). Eschar recently submitted his PhD, entitled "*Functional genomics and systems genetics of cellulose biosynthesis in Eucalyptus*", for examination. He was supervised by Prof Alexander Myburg and co-supervised by Prof Shawn Mansfield (University of British Columbia) and Prof David Berger (University of Pretoria).



Eshchar Mizrachi



Prof Robin Crewe

Prof Crewe receives Harry Oppenheimer Fellowship

Prof Robin Crewe recently received the prestigious Harry Oppenheimer Fellowship Award for 2012. Prof Crewe, a professor in the Department of Zoology and Entomology and Director of the Centre for the Advancement of Scholarship is the thirteenth recipient of the Award since its inception and the first from the University of Pretoria (UP).

Prof Crewe said: "This very generous award provides us with an extraordinary opportunity to document the importance of understanding the biology of African honeybee populations and the conception of honeybee sociality globally. Additionally it provides potential solutions to the threat of the loss of honeybee populations."

The Harry Oppenheimer Fellowship Awards were initiated in 2001 to commemorate efforts to support human and intellectual development, to advance scholarship and to encourage new ideas. The fellowship has a monetary value of R1 million and is considered a special investment to encourage and acknowledge excellence in scholarship in all its forms. Candidates from all disciplines compete annually for the award and it is granted to scholars of the highest calibre, who are engaged in cutting-edge, internationally significant work that has particular applications to the advancement of knowledge, teaching, research and development in South Africa.

Prof Crewe, a NRF-rated scientist, is a founder member of the Academy of Science of South

Africa, a fellow of the Royal Society of South Africa, the Royal Entomological Society of London and the World Academy of Science. He also serves as a council member of the Academy of Science of the Developing World and chairs the Board of the Network of African Science Academies. Other highlights in his career were serving as Dean of the Faculty of Natural and Agricultural Sciences and Vice-Principal: Research and Postgraduate Studies at UP.

The Award will enable Prof Crewe to produce a monograph on competitive interactions in colonies of the honeybee *Apis mellifera*, in collaboration with Prof Robin Moritz of the University of Halle-Wittenberg.

Four female PhD graduates received degrees at September ceremonies

Four female members of staff in the Faculty of Natural and Agricultural Sciences received their PhDs during this year's September graduation ceremonies.



Yvette Naudé

Yvette Naudé (in Chemistry)

Thesis: *Versatile silicone rubber samplers for trace organic analysis in a Chromatography - Mass Spectrometry laboratory*

Supervisor: Prof ER Rohwer



Marien Graham

Marien Graham (in Mathematical Statistics)

Thesis: *Contributions to the theory and applications of univariate distribution-free*

Shewhart, CUSUM and EWMA control charts

Supervisor: Prof S Chakraborti

Co-supervisor: Dr SW Human



Kershney Naidoo

Kershney Naidoo (in Genetics)

Thesis: *Mitochondrial genomes and concerted evolution in Ceratocystis*

Supervisor: Prof BD Wingfield

Co-supervisor: Prof ET Steenkamp

Co-supervisor: Prof MJ Wingfield



Liesl Dyson (in Meteorology)

Thesis: *Atmospheric thermodynamics and circulation associated with heavy rainfall over the Gauteng Province, South Africa*

Supervisor: Prof J van Heerden

Co-supervisor: Prof PD Sumner

Liesl Dyson (middle) and some of her students.

Two UP chemists elected to SACI

Two academic staff members of the Department of Chemistry in the Faculty of Natural and Agricultural Sciences were recently elected to the Executive Committee of the South African Chemical Institute (SACI). Prof Simon Lotz was elected the President of SACI and Dr Patricia Forbes as the Executive Secretary.

Prof Lotz is a professor in Inorganic Chemistry at the University of Pretoria. His research focus is on the synthesis of useful organometallic compounds and their application in homogeneous catalysis, anticancer drugs and material science. His specific interests are on the metal-carbon double bond and the role this plays in template reactions. His publications comprise more than 70 ISI accredited articles in international journals and sections in reference books. He is a fellow of the Royal Society of Chemistry and is a member

of the American Chemical Society. He is currently rated as a B3-researcher by the National Research Foundation (NRF).

Dr Forbes' research focuses on atmospheric monitoring involving the development of novel sampling and analytical methods for environmental pollutants. She is specifically interested in semi-volatile organic compounds, primarily polycyclic aromatic

hydrocarbons (PAHs), and their potential impact on human health. Dr Forbes is also the Chairperson of the Chromatography Division of the South African Chemical Institute and was recently awarded a Y2 rating by the NRF.



Prof Simon Lotz



Dr Patricia Forbes

Biological control agent for Bronze Bug to be released in South Africa

The Tree Protection Co-operative Programme (TPCP) based at the Forestry and Agricultural Biotechnology Institute (FABI) recently received permission from the Department of Agriculture, Forestry and Fisheries (DAFF) and the Department of Environmental Affairs (DEA) to release the parasitic wasp *Cleruchoides noackae* (Mymaridae), for the biological control of the Bronze Bug, *Thaumastocoris peregrinus*. This is an incredibly important milestone in terms of ensuring sustainable plantation forestry in South Africa. It marks the culmination of a long and often tedious process, involving commendable commitment and effort on the part of many people.

Cleruchoides noackae was first imported into the FABI Bio-control Centre at the University of Pretoria in 2008. This minute parasitic wasp (less than 0.5 mm in length) is extremely difficult to rear, in part because it is very delicate and therefore difficult to handle. It was only after

considerable effort to develop new rearing techniques that studies on its biology and host specificity could commence. These studies, which needed to be carried out with meticulous detail, provided the first study of *C. noackae* biology (now published) and showed that *C. noackae* was host specific, and therefore safe for release.

An application for permission to release *C. noackae* was submitted in January 2013 to DAFF by FABI on behalf of the forestry industry. After in-depth review, it was concluded that *C. noackae* was safe to release as a biological control agent in South Africa.

The release strategy for *C. noackae* in South Africa must still be finalised. But, it will likely follow a similar classical biological control approach to that used with *Selitrichodes neseri*, the biological control agent for *Leptocybe invasa*, developed and released by the TPCP in 2012. Therefore, releases will most likely be made as

widely as possible and the released individuals will be expected to establish and spread in those areas.

At this stage it is impossible to know what impact *C. noackae* will have on *T. peregrinus* populations. But, *C. noackae* has been released as a biological control agent in Chile and Brazil, and preliminary results show that the insect has established itself well in these areas. Clearly post-release monitoring will be required to determine the success of the releases and the rate of establishment of *C. noackae* in South Africa.

Many people and organisations have contributed to the considerable effort which has led to this point where *C. noackae* can now be released. However, special thanks are due to the members of the TPCP and particularly the TPCP Board, who supported the work, both financially and otherwise; the Department of Trade and Industry.



Marlene Harney, Eston Mutitu, Tanya Joffe and Anne Noack in discussion at the FABI Biocontrol Centre.



Techniques used to rear and study the biology of *C. noackae*.

(DTI) through their THRIP initiative; the National Research Foundation and the University of Pretoria for financial support; the staff of DAFF, who dealt speedily and professionally with the application for release; Prof Stefan Naser who, together with Ryan Nadel of the ICFR as part of his PhD at FABI, assisted in importing the original *C. noackae* into South Africa, and has provided remarkable guidance in the rearing and experimentation of *C. noackae* from 2008 to 2013; Ryan Nadel and Eston Mutitu who added substantially to the understanding of *C.*

noackae during their PhD studies; Dr Annie Noack (Australia) for providing invaluable advice on the rearing of *C. noackae* and who has sent numerous consignments of *C. noackae* to the FABI Bio-control Centre for study, and last but not least, the technical staff of the FABI Bio-control Centre, in particular Marlene Harney and Samantha Bush, together with Joseph Khadile, Tanya Joffe, and a number of NMMU students, whose great dedication and ingenuity has made this release possible.

The Pest: *Thaumastocoris peregrinus*

Thaumastocoris peregrinus is a sap-sucking insect that feeds on Eucalyptus leaves and is native to Australia. This bug (a true bug of the Order Hemiptera) was virtually unknown in its native range until 2002, when it became a pest in the Sydney and Brisbane areas. This build-up of populations in large centres in Australia most likely contributed to its spread to South Africa.



Thaumastocoris peregrinus eggs and adult.

Thaumastocoris peregrinus was first noticed in South Africa in 2003 in the Pretoria area. It was first reported in Eucalyptus plantations in 2005, and was soon present in all the main Eucalyptus growing areas. The insect infests numerous Eucalyptus species, hybrids and their clones. Severe infestations can lead to canopy thinning, branch die-back and stunted growth of the trees. Chemical control and host resistance are not viable, and biological control is currently considered the only tool to manage *T. peregrinus* populations.



The parasitic wasp *C. noackae* – this family of wasps (Mymaridae) are also known as 'fairyflies' because of their delicate wings (Photo: Samantha Bush).



Prof Robert (Bob) Millar

Prof Robert Millar publishes in prestigious journal

Prof Robert (Bob) Millar, Director of the Mammal Research Institute in the Department of Zoology and Entomology and Co-director of the MRC Receptor Biology Unit at UCT has not only published his research in over 400 internationally peer-reviewed journals which have received over 15 000 citations (H-index 65) but he also recently published an article in the prestigious journal, *Nature*.

Prof Millar is one of only a few scientists at the University of Pretoria who has an A-rating from the National Research Foundation.

His research focuses on the neuroendocrinology of reproduction. This latest article focuses on the fact that reproductive hormones play a role at all stages of life from sperm and egg production, fertilisation, fetal development, birth, neonatal development and puberty through to adulthood and old age. Therefore the reproductive hormone cascade (brain-pituitary-ovary/testis and target organs (e.g. breast and prostate) was, therefore, been the target for the development of numerous drugs that modulate its activity at many levels. As the central regulator of the cascade, analogues of brain gonadotropin-releasing hormone (GnRH) have found extensive applications in treating a wide range of hormone-dependent diseases, such as precocious puberty, prostate cancer, benign prostatic hyperplasia, endometriosis and uterine fibroids, as well as being an essential component of in vitro fertilisation protocols. The neuroendocrine peptides that regulate GnRH neurons, kisspeptin and neurokinin B, were also identified as therapeutic targets; and

novel agonists and antagonists are being developed as modulators of the cascade upstream of GnRH. In this article he reviewed the development and applications of analogues of the major neuroendocrine peptide regulators of the reproductive hormone cascade: GnRH, kisspeptin and neurokinin B, and highlighted new potential applications in hormone-dependent diseases.

Prof Millar is a pioneer in research on GnRH and its receptor which has led to the development of a billion dollar market in GnRH drugs for the treatment of a range of diseases such as prostatic and other cancers, as well as endometriosis and polycystic ovarian disease which afflict up to 30% of women. Recently, he discovered novel antagonists of kisspeptin which have potential as more subtle regulators than GnRH drugs.

He was recently inaugurated as a member of the Academy of Science of South Africa (ASSAf) and was awarded a National Science and Technology Forum (NSTF) Award for 2013. Prof Millar received the Lifetime Achiever Award for his outstanding contribution to science, engineering, technology and innovation (SETI) over a lifetime. He has made numerous discoveries which were translated into effective treatments for reproductive diseases and cancers. One of his contributions resulting from his consultations for the pharmaceutical industry an expert in GnRH analogues was to bring the clinical development of the prostate cancer drug, Triptorelin, to South Africa – the first and only drug in which all clinical development for registration with the FDA was exclusively done in South Africa.



UP becomes key partner in global food security initiative



Prof Sheryl Hendriks

The University of Pretoria's commitment to the fight against hunger was reaffirmed with the announcement of the University's key involvement in a global food security initiative by the American government.

As part of Feed the Future – an initiative by the American federal government – UP and the Michigan State University (MSU) will use a grant from the US Agency for International Development (USAID) to strengthen developing countries' abilities to fight hunger through improved food policies.

UP's Institute for Food, Nutrition and Well-being (IFNuW) will partner with MSU's Food Security Group and the International Food Policy

Research Institute in Washington, D.C., to form the new Feed the Future Innovation Lab for Food Security Policy.

The Innovation Lab is one of two new research consortiums of its kind announced in July this year during the launch of USAID's Feed the Future 2013 Progress Report in Washington. These Innovation Labs draw on the expertise of top universities and represent a new model of development, using science and technology to address challenges in agriculture and food security.

The consortium will work with governments, researchers and private sector stakeholders in

diets at lower cost for consumers and greater stability in food markets.

"UP is an equal consortium partner on this project, explained Prof Sheryl Hendriks, Director of IFNuW. "The overall goal of the programme is to promote inclusive, agricultural productivity growth, improved nutritional outcomes, and enhanced livelihood resilience through improved policy environments.

"The exciting part for UP is that it aligns and extends the University's Institutional Research Theme (IRT) on Food, Nutrition and Well-being and the work of IFNuW addressing the complexities of food insecurity and hunger.



a number of Feed the Future focus countries in Africa, Asia and Latin America to increase agricultural productivity, improve dietary diversity and build greater resilience to challenges (like climate change) that affect livelihoods. The result will be higher incomes for farmers, higher quality

The programme will form a large part of the strategic area identified through the design of the IRT on food policy and its impact on improving food security in Africa. The programme will draw on UP experts associated with this IRT," said Prof Hendriks.

Research





Pioneering rainwater harvesting system developed in Botanical Garden

The pioneering model landscape for the new Mining Engineering Study Centre and the 'new' heart of the Manie van der Schijff Botanical Garden was recently introduced. This new development presented many design challenges, namely dealing with storm water off the new building (1 600 m² roof) and surrounds, waterproofing of the existing lecture halls,

merging of a barren and sterile landscape into the botanical garden. Another challenge was providing for the blind student fraternity that frequents the area.

To resolve these issues and use natural processes to the best advantage, a lined (to waterproof the structure) rain garden was

constructed through which storm water is cleansed using bio-swales. The water flows into permanent ponds, which are home to numerous aquatic plants, fish and frogs. Seasonal tidal ponds surround the permanent ponds. Excess water from the structure will be collected in a 130 m³ underground tank, to feed into the Botanical Garden's irrigation system.

The planting design and material, selected by the Curator of the Botanical Garden, Jason Sampson, will employ the theory of bioremediation and habitat creation for further research, whilst expanding the plant collections of the University. The tropical African cycad collection will also be housed in this extensively landscaped area, a fitting aesthetic feature for an important entrance to the Hatfield Campus.

The space was lined with lit seating walls to prevent cluttering of the newly paved walkways. The shapes of these walls are in keeping with the water theme and are beneficial to the sight impaired students as they move about. All the existing trees were retained in the design. In future, the garden will include artwork, developed in conjunction with the Department of Fine Arts.



Importance of warm nectar and warm wax for honeybees

Warm nectar in flowers may be an extra incentive for pollinators. Researchers in the Department of Zoology and Entomology under leadership of Prof Sue Nicolson tested this on cold winter mornings in Pretoria by providing sucrose solutions, maintained at 20-35°C with aquarium heaters, outside bee hives at the University's Experimental Farm.

They caught returning bees and measured their crop loads, which increased with nectar temperature, and so did the total consumption by all bees visiting the feeders. Marking individual bees showed that their preference shifted towards higher nectar temperatures with successive visits to the feeders. According to Prof Nicolson there are two possible benefits to foraging on nectars that are warmer than air temperature: reduced thermoregulatory costs, and faster drinking times due to the lower viscosity. A preference for less viscous nectar was shown by offering the bees sucrose solutions with increased viscosity by adding the inert polysaccharide Tylose®. Bees thus prefer warmer and less viscous nectar, independent of changes in its sugar concentration.



Bee on bottlebrush

Another way in which bees benefit from warmth is by constructing a honeycomb in the hive. The hexagonal shape of cells in the comb minimises the amount of wax and the weight. For centuries people have wondered at the mathematical abilities of bees in constructing them so perfectly. A group of engineers has recently published a study showing

that bees construct cells that are circular in cross section, relying on body warmth to pull the cells into the familiar hexagonal shape.

This confirms earlier work of Prof Christian Pirk and colleagues in 2004, showing that the thermoplastic features of wax result in round cells "flowing" into the hexagonal structure in the presence of heat (30-45°C). The thermoplastic feature means that the wax becomes pliable or mouldable, roughly comparable with rubber or play dough, which might be stiff at 5°C but softer and easier to form at 35°C. So, as proposed by Prof Pirk and others as early in 2004,

all it takes is the heat of the bees' bodies and the thermoplastic properties of wax to make hexagonal cells: the rest is just physics.



Wax strip showing the transition from recently built circular cells (left) to older hexagonal cells (right).



Prof Theresa Aveling

Research on high seed quality leads to better crops



From ancient times on seed was transported by humans wandering the earth to find better places to live and cultivate their crops. It is highly likely that several pathogens would have been carried along with this seed. History tells us of severe outbreaks of ergotism (St. Anthony's fire and gangrene) caused by the fungus *Claviceps* in the seed of rye and wheat that was used to make bread.

Today seed testing centres exist in almost every country in every corner of the globe. However, testing seeds for the presence of pathogens is more difficult as we are dealing with a complex of biological factors involving the seed, the pathogen and even the environment.

Prof Theresa Aveling from the Department of Microbiology and Plant Pathology and FABI is one of 13 partners in the TESTA consortium (and the only one from South Africa). This 3 million Euro EU-FP7 project runs over three years and aims to support regulatory and quality controls to reduce the risk of seed transmitted diseases and pests, by up-to-date underpinning methodologies for risk assessment, sampling and detection of pests and pathogens in seed lots and disinfection treatments. Prof Aveling is an international expert on seed pathology and production in

non-European Union (EU) countries and will provide insight into emerging risks. She is also responsible for establishing a comprehensive web-based database as a global resource, detailing all known pests and diseases of crop plants transmitted by seed.

The aims of TESTA are to develop faster, more accurate methods to assess the mode of seed transmission, determine economic and practical sampling approaches for the detection of low levels in large seed lots, develop novel, efficient generic detection methodologies and non-destructive testing methods and develop improved, effective and sustainable disinfection methods.

Details of the project can be found at www.seedtesta.eu or by contacting Prof Aveling at terry.aveling@fabi.up.ac.za



Jacaranda trees in bloom in Pretoria

Fungus threatens to wipe out Jacarandas

Pretoria faces a future without its famed Jacaranda trees, as a deadly fungus, which has been eating away at their roots for some time now, slowly attacks them. Trees in some parts of the city are already at different stages of the disease, as branches fall off and leaves dry out.

In an article in *Pretoria News* in October this year, Prof Mike Wingfield said: “They are sick, and... we are facing a possibility of a city without Jacarandas, but probably not in our lifetime.” Prof Wingfield is Director of the Forestry and Agricultural Biotechnology Institute (FABI) and a biotechnology expert. He also said that the root disease was caused by a fungus, suspected to be native to the city.

It is thought that the fungus originated from the roots of other trees. “It’s moving quite slowly and it could take a while to wipe them all out, but then there is always the possibility that some other disease could come in and wipe them all out quickly – that is what has happened with many other street and garden trees in other parts of the world,” Prof Wingfield said.

Pretoria is renowned for its Jacaranda trees, which turn the streets into a riot of purple blooms for about two months at the start of spring. For about eight weeks, purple flowers line the streets of the inner city and suburbs, as well as parks across the city.

Many conference-goers plan their trips for October and tour buses drive through streets not normally on their routes, so that tourists can take pictures of the Jacarandas. There is an estimated 60 000 to 70 000 trees in the city. They were introduced to the city in about 1888 from South America.

Referring to a controversy that surrounds the trees, Prof Wingfield said they were declared a noxious weed, and there were “even suggestions by some groups that they should be cut down”.

According to the website gopretoria.co.za, since the tree is exotic, they are considered to be an

he showed a team from the *Pretoria News* signs of a fungus, which he said, was the beginning of the end for the tree.

Prof Wingfield, who has a special interest in the origin and patterns of global movement of insect pests and pathogens of trees, also pointed out branches affected by the disease, which had gone dry and whose leaves are falling off.

“This tree will be dead in four to five years, perhaps sooner,” he said. Other trees in his neighbourhood have also started drying up, some barely shadows of their former selves, as they stood with no flowers, and broken branches.

“The branches sometimes break and fall off as the roots become diseased – this has been going on for a while in the city,” he said. When the trees sensed that they were dying they rushed to produce seeds in an effort to reproduce before they die.

Prof Wingfield said because trees lived for such a long time, their deaths, sometimes after a century or more of growth, was “tragic”. “Trees make you happy, they make the environment beautiful,” he said.

Residents of the city should be grateful that someone had the good sense to plant seeds along the streets of the city, Wingfield said.

The Jacaranda tree is listed as “vulnerable” on the International Union for the Conservation of Nature and Natural Resources’ Red Data list.



Prof Mike Wingfield

invader plant. Therefore no new trees are allowed to be planted. Recently, municipal bylaws were passed that allow existing trees to be kept, but they may not be replaced when they die.

Prof Wingfield disagrees with this policy and believes that they should be replanted in the city where they should remain a national heritage. “They are, however, unable to protect themselves when they fall under the threat of disease,” he said, adding that diseases are known to be able to wipe out entire forests.

He spoke from his home in Brooklyn, where he has a variety of trees, and where the streets outside are lined with Jacaranda trees. Outside his own gate is a huge Jacaranda tree, on which

Written by: Ntando Makhubu (*Pretoria News*)

Exciting research by Aon Benfield Natural Hazard Centre



Prof Andrzej Kijko

As a result of a five year long exclusive partnership between a leading reinsurance intermediary and capital advisor, Aon Benfield, and the University of Pretoria (UP), the *Aon Benfield Natural Hazard Centre, Africa has grown from strength to strength through outstanding market related research.

Through commercial and research projects the Centre continues to focus on delivering highly scientific and relevant research. Some of the research, which in many instances can be applied to different fields of interest, include the extension of the Aki-Utsu b-value estimator for incomplete catalogues in seismic hazard analysis, the identification of a mathematical error in the Bayesian procedure of maximum earthquake magnitude estimation, as well as the seismic and tsunami hazard assessment for South Africa.

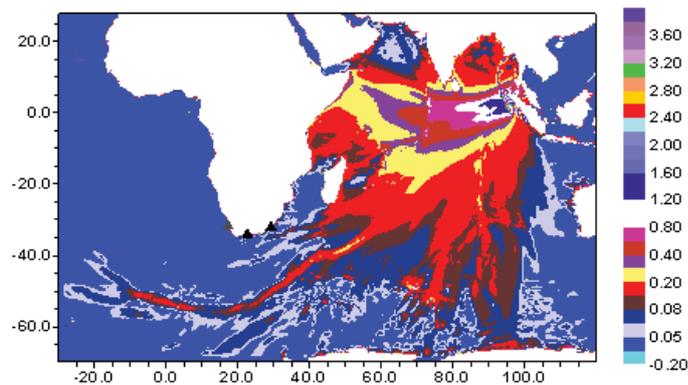
The extension of the Aki-Utsu b-value estimator for incomplete catalogues (Kijko and Smit, 2012) extends the Aki (1965) maximum likelihood estimate of the Gutenberg-Richter b-value for the use of multiple catalogues with different levels of completeness. This methodology is easy to use with relevant confidence intervals for the newly derived estimator, and is universally applicable in the determination of any parameter when dealing with limited or incomplete data.

According to the Director of the Centre, Prof Andrzej Kijko, the Centre is also currently focussing on developing justifiable alternative approaches to the currently used Bayesian procedure, Cornell (1994) for the estimation of the maximum possible regional earthquake magnitude (m_{max}) (Kijko, 2012). The application of the current Bayesian formalism results in the likelihood function reaching its peak at the maximum observed earthquake magnitude, rather than maximum possible magnitude. This may lead towards underestimation of 0.5 units. The paper by Kijko (2012) proposes a simple ad hoc solution to estimate potential magnitudes which have been used as

a standard in the nuclear industry in the estimation of the probabilistic and deterministic seismic hazards for nuclear power plants. This can also be applied for developing earthquake catastrophe models in particular when dealing with regions with less well distinguished tectonic characteristics and incomplete earthquake catalogues. The Centre is currently focussing on the development of more statistically based approaches to this project. The fundamental theory developed for this project will also be translatable to other fields of natural and commercial analysis, for example tsunamis, flooding and operational risk.

The 26 December 2004 Sumatra and 11 March 2011 Japan earthquakes and tsunamis were clear reminders for the need to assess the impact of tsunami hazard for the world's vulnerable coastlines. Failure to accurately assess the risks associated with tsunamis can have devastating effects on a country's infrastructure, economic stability and the quality of life (World Bank, 2005). The Centre, in conjunction with the international renowned tsunami specialist, Prof G A Papadopoulos from the National Observatory in Athens (NOA), collaborated in establishing the expected potential tsunami hazard for the South African coast. Due to lack of sufficient historical data of tsunamis in the South African coastal area, only a probabilistic method can be employed to assess the tsunami hazards in this region. The aim of the project was the application of developed mathematical formalisms to South African conditions. This resulted in the quantification of the seismic hazard of tsunami-generating areas posing a threat to the coastal areas of South Africa. These results were utilised to quantify the tsunami hazard to critical structures located on the coastal areas of South Africa, for example Koeberg Nuclear Power Plant, harbours, and metropolitan cities such as Durban, Port Elizabeth and Cape Town. The project was financially supported by both the Nuclear Structural Engineering (Pty) company and the National Research Foundation through the THRIP project TP2011061400009. Several publications on the obtained results are currently in the pipeline.

Figure 1. Maximum surface elevation (m) at all times due to Sumatra earthquake with homogeneous seismic slip. Triangles from west to east represent Cape Town, Port Elizabeth and Durban.



*The University of Pretoria re-modelled its former Aon Benfield Natural Hazard Centre, Africa into a multi-partnership centre known as the University of Pretoria Natural Hazard Centre, Africa.



Deputy Dean for Teaching and Learning appointed in Faculty

Prof Marietjie Potgieter

Prof Marietjie Potgieter was appointed as the Deputy Dean for Teaching and Learning in the Faculty of Natural and Agricultural Sciences, as from 1 September 2013 until 31 August 2017.

Prof Potgieter is an associate professor in the Chemistry Department and has been acting as Deputy Dean from 1 January 2013. During this relatively short period as acting Deputy Dean, Prof Potgieter managed the Teaching and Learning portfolio of the Faculty with distinction. She has been responsible for chairing the Teaching and Learning Committee and through her leadership, good progress was made in the rationalisation of some of the programmes in the Faculty. She has also been responsible for driving the key interventions that form part of the strategic priorities of the Teaching and Learning section of the Faculty Plan.

Prof Potgieter has a longstanding record of contributions to Chemistry Education within the secondary as well as tertiary education system. These contributions include research publications within the field, presentations of various lectures at national and international conferences, as well as being elected on national and international bodies, representing science education. She also received the South African Chemistry Institute (SACI) Education Medal in 2008 for her outstanding contribution to Chemical Education, judged by her published work over a five year period.

Prof Potgieter received a commendation award from the Higher Education, Learning and Teaching Association of Southern Africa (HELTASA) for teaching excellence in 2010. She is also one of the founding members of a new initiative in the Faculty, the Science Teaching and Learning (SCITAL) Forum. The aim of SCITAL is to bring together staff with a common and particular interest in teaching and learning.

"I am honoured to be appointed in this position and I envisage a faculty that continuously refines instructional practices in order to deliver graduates with appropriate attributes to enter the workplace as highly skilled professionals or to undertake postgraduate research in a research-intensive university," said Prof Potgieter.

She emphasises that the University of Pretoria has set itself the strategic goal to achieve excellence in teaching and learning, benchmarked against international research-intensive universities. "To achieve this goal, research focusing on tertiary mathematics and science education should become an integral part of research activities in the Faculty. This will ensure that our teaching practice is informed by international best practices that has been rigorously scrutinised and proven to be relevant and suitable to our context."

Prof Brenda Wingfield reappointed as Deputy Dean

Prof Brenda Wingfield was appointed for a second term of four years as the Deputy Dean: Research and Postgraduate Studies of the Faculty of Natural and Agricultural Sciences as from 1 October 2013.

Prof Wingfield is a researcher of international repute and was also elected to the Council of the Academy of Science of South Africa (ASSAf) for the 2012 to 2016 cycle. She has published more than 240 peer-reviewed articles. Prof Wingfield is one of the Research Leaders of the Department of Science and Technology (DST)/NRF Centre of Excellence in Tree Health Biotechnology, Chairperson of the National Science and Technology Forum (NSTF) and previous Vice-Chairperson of the Board of Trustees of PlantBio, one of the national biotechnology innovation centres.



Prof Brenda Wingfield

She was the winner of the Department of Water Affairs and Forestry's Women in Water, Sanitation, and Forestry Research Award in 2007, the DST's Distinguished Women in Science Award in 2008 and the African Union's Women in Science Regional (Southern) Award in 2009. Prior to this award, she was recognised four times as an Exceptional Academic Achiever. She has a B rating from the National Research Foundation (NRF). She was awarded the Chancellor's Award for Research in 2012.

Prof Wingfield's research interests include fungal population genetics and fungal phylogenetics. In addition to her internationally recognised research programme on the molecular phylogeny and taxonomy of tree pathogenic fungi, she is now developing a fungal genomics programme. Her research team has recently published their first genomics paper, "First fungal genome sequence from Africa: Consequences scientific and regional". Her research team has already sequenced an additional twenty fungal genomes. This veritable "tsunami" of sequence data is contributing significantly to the research which is being accomplished at the University of Pretoria.

"In my second term as Deputy Dean: Research and Postgraduate Studies, I hope to further enhance the postgraduate student experience and the research outputs of the Faculty and support the careers, particularly those of the young academics in science."



Prof Andriette Bekker

First female Head for Department of Statistics

(now the University of Johannesburg), and completed her PhD at the University of South Africa.

Currently, she holds a C2 rating from the NRF, and is an associate editor of *Communications in Statistics*. She has acted as referee for several national and international research journals and leads the Statistical Distribution Theory-research group at the University of Pretoria. Her research interests include distribution theory and reliability theory, and over the past few years she has collaborated with researchers of world-renown in these fields.

One of many valuable contributions made to the Department by Prof Bekker and the Department's management team, is the development of a postgraduate student centre, informally known as 'the Hub' within the Department. The

aim of this centre is to provide master's and PhD students simultaneously with teaching, research focus, and exposure to industry. This was done in recognition of the importance of young researchers and lecturers in statistics, and in order to provide them (and fortuitously all other members of the Department) with a holistic statistical background at the University of Pretoria. She envisages the Department to be at the forefront of international statistical development, and encourages a 'Make It Count' environment.

Prof Nico Crowther



The first female head of the Department of Statistics in the Faculty of Natural and Agricultural Sciences, Prof Andriette Bekker, was appointed with effect from 1 September 2013. She succeeds Prof Nico Crowther, who was Head of the Department since 1991.

Prof Bekker completed her undergraduate studies, and initial postgraduate work up to master's level, at the Rand Afrikaans University

Prof Anguelov leads Mathematics and Applied Mathematics Department

Prof Roumen Anguelov, a mathematician with a keen interest in Dynamical Systems, Mathematical Modelling and Numerical Analysis was appointed as the new Head of the Department of Mathematics and Applied Mathematics in the Faculty of Natural and Agricultural Sciences from 1 August 2013.

He succeeds Prof Jean Lubuma, who headed the Department from 1 May 2004 and is now leading the SARChI Chair in Mathematical Models and Methods in Bioengineering and Biosciences.

Prof Anguelov enjoys considerable international recognition as a researcher, as reflected in his B3 rating by NRF. He completed his MSc in Mathematics at the Sofia University and his PhD at UNISA.

Prior to his appointment at UP in 2001, Prof Anguelov was a senior lecturer at the former Vista University, as well as in Zimbabwe and in Bulgaria. He maintains a good publication record and a vibrant research network of collaborators and students. Although he is relatively new in the field of Biomathematics, his work has received strong recognition from researchers in the field. Through the efforts of a group of very strong researchers in Biomathematics and the support of the wider research community he and other researchers have established a new international and interdisciplinary journal *BIOMATH*. Prof Anguelov is editor-in-chief of this journal. In 2009 he was elected as an Associate Member of the Institute of Mathematics and Informatics at the Bulgarian Academy of Sciences, as acknowledgement for work done.



Prof Roumen Anguelov



Prof Jean Lubuma

As the Head of the Department, Prof Anguelov says that his first priority would be the transition from a teaching-intensive unit to a research-intensive unit. "I also strive towards the ideal that the Department's research and teaching activities become an integral part of the academic enterprise at the University, with strong links to existing and emerging centres of excellence as well as the Institutional Research Themes. I also want the impact of the academic activities of the Department to be keenly felt in the society, where the lack of education in mathematics is a recognised major impediment to development. We also need to build on our existing strengths," stated Prof Anguelov.

Faculty recruits many new renowned academics and researchers

The University of Pretoria has identified, as one of its main strategic priorities, attracting and retaining excellent members of staff in order to ensure its commitment to quality and excellence in its core functions. The Faculty of Natural and Agricultural Sciences which is people centred continuously seeks opportunities to recruit and appoint highly recognised researchers and academics. In the past few months the Faculty recruited and appointed quite a few internationally acclaimed, high profile researchers and academics to further improve the reputation and high academic standing of the Faculty.



Dr Tjaart Krüger

Dr Tjaart Krüger

Dr Tjaart Krüger was recently appointed in the Department of Physics to assist in establishing Biophysics as a new field of research and an accredited field of study at the University of Pretoria.

Dr Kruger completed his BSc in Physics, Mathematics, and Applied Mathematics (all subjects cum laude) in 2003 and then an MSc in Heliospherical Physics (cum laude) in 2005, also at the Northwest University, Potchefstroom Campus, Unit for Space Physics. He completed his PhD in 2011 in Biophysics (cum laude) at the Vrije Universiteit Amsterdam, Department of Physics and Astronomy

Prior to his appointment to UP, he held postdoctoral positions with the Unit of Biophysics and Laser Centre at the Vrije Universiteit, Amsterdam as well as two short PhD Fellowships with the University of Florence, Italy (European Laboratory for Non-linear Spectroscopy, LENS) and the Vilnius University, Lithuania (Vilnius University Laser Research Centre).

His current research can be summarised as the development of novel spectroscopy methods for understanding and controlling molecular interactions in biological systems. These methods are developed in the ultrafast limit (i.e., on femtosecond to picosecond timescales) and in the single-molecule limit, and are applied on natural light harvesters to obtain a fundamental understanding of molecular photo-protection.

Prof Roy Booth

A renowned physicist, Prof Roy Booth, who was employed by the Square Kilometre Array (SKA) project and who has vast experience in radio astronomy, was recently appointed by the Department of Physics, to establish a programme in Astronomy.

Prior to his appointment at the University of Pretoria earlier this year, he was the Acting Director Science Operations at the SKA and also represented the SKA SA project on the SKA Science and Engineering Committee. From 1982 to 2006 Prof Booth was the Director of Onsala Space Observatory (which became the Swedish National Facility for Radio Astronomy) as well as Professor of Radio Astronomy at the Chalmers University of Technology. He was involved in the project to build a millimetre wavelength radio telescope on a high 2 300 m mountain in Chile, in collaboration with the European Southern Observatory – the Swedish-ESO Sub millimetre Telescope. Prof Booth also initiated another Swedish-ESO project where they built a millimetre-wave interferometer, which became a European-wide collaboration. In due course it was merged with similar projects in Japan and the USA to become, the Atacama Large Millimetre Array (ALMA). This is already partially operational on the high mountain site (5 000 m) of Chajnantor in Northern Chile.



Prof Roy Booth

After graduation from University of Wales (Swansea) with a BSc degree in 1959, Prof Booth completed his master's in Upper Atmosphere Physics (University of Belfast) in 1964. His PhD in Radio Astronomy from the University of Manchester was conferred on him in 1963. In 1993, he was awarded an honorary doctoral degree by the Nicolas Copernicus University, Torun, Poland, following collaborations in very long baseline interferometry. He is also a member of the Royal Swedish Academy of Sciences.



Prof Wolf-Dieter Schubert

Prof Wolf-Dieter Schubert

Prof Wolf-Dieter Schubert, a professor in Structural Biology has been appointed in the Department of Biochemistry at the University of Pretoria (UP).

Prior to his appointment at UP, he was professor at the University of the Western Cape (UWC) and also Deputy Head of the Department of Biotechnology from 2011 to 2012. Prof Schubert was also a Group Leader at the Helmholtz Centre for Infection Research in Brunswick, Germany from 2005 to 2009.

Prof Schubert completed a BSc, honours as well as a master's degree in Chemistry at the University of Cape Town. He completed his PhD *Summa cum laude* (Distinction) at the Free University of Berlin in Germany. Prof Schubert was also a postdoctoral fellow for a few years at the German Research Centre for Biotechnology.

He has an H-index of 23 with 2 148 citations and currently has a NRF B1-rating. Prof Schubert's research interests include Structural Biology, Biophysics, Biochemistry, Molecular mechanisms of communicable diseases, Molecular aspects of innate immunity as well as Drug discovery/design.

Over the last decade, his research has focussed on the molecular mechanisms underlying bacterial infectious diseases. The main organisms from which projects were selected include the mammalian pathogens *Listeria monocytogenes*, *Pseudomonas aeruginosa*, *Legionella pneumophila*, *Streptococcus sp.*, *Yersinia pseudotuberculosis* and *Helicobacter pylori*. Recently the focus has, however, shifted to include *Mycobacterium tuberculosis*, the causative agent of human tuberculosis – a major cause of premature death in South Africa. Following his move to the University of Pretoria, he plans to extend his research base to other human and animal pathogens such as Malaria, African horse sickness, avian influenza and ticks in collaboration with colleagues in the Natural Sciences, Veterinary Sciences and Health Sciences.

Prof Coleen Vogel

Prof Coleen Vogel recently joined the Department of Geography, Geoinformatics and Meteorology after serving at the University of the Witwatersrand for over 30 years. She is a climatologist by training, but has increasingly worked in the social dimensions of climate change, focussing particularly on climate change adaptation. She was chairperson and vice chairperson of international global environmental change scientific committees (eg IHDP and LUCC and involved in the Earth System Science Programme – groups that preceded the current Future Earth developments). She assisted in several government-related development activities and was a contributor to the Disaster Management Act process in South Africa.

She was one of the chapter lead authors of the Fourth IPCC (Intergovernmental Panel on Climate Change) Africa Chapter and was also part of the final synthesis author panel of that report. She is currently a chapter author contributing to the 5th Assessment of the IPCC, working on a chapter dealing with Human Security. A Nobel Peace Prize was awarded to the author team, together with Al Gore for the efforts made in compiling the 4th assessment report. She also received the Burtoni Award for international excellence in adaptation research and received the University of the Witwatersrand Vice-Chancellor's Teacher's award for excellence in teaching. Prof Vogel is also an Extraordinary Professor at the University of Stellenbosch and assists in some teaching on climate change adaptation and transdisciplinarity.



Prof Coleen Vogel

Her current research interests remains working in the social and human dimensions of climate change resilience, including helping to build and enhance robust responses to climate change adaptation, effective climate change responses and efforts in disaster risk reduction. She is currently involved in working with various 'users' in climate change adaptation efforts and is also assisting in some of the University of Pretoria's efforts on Food Security. She is also very interested in 'Education for climate change adaptation' and is part of a reference group of the Soros Open Society Foundations, promoting university curriculum development on climate change adaptation in Africa.

Prof James Raftery

Prof James Raftery was appointed in the Department of Mathematics and Applied Mathematics earlier this year.

He was employed by the University of KwaZulu-Natal as a lecturer in 1986 and was promoted through the ranks, becoming professor in the Department of Mathematics and Applied Mathematics, now known as the School of Mathematics, Statistics and Computer Science, in 2001.

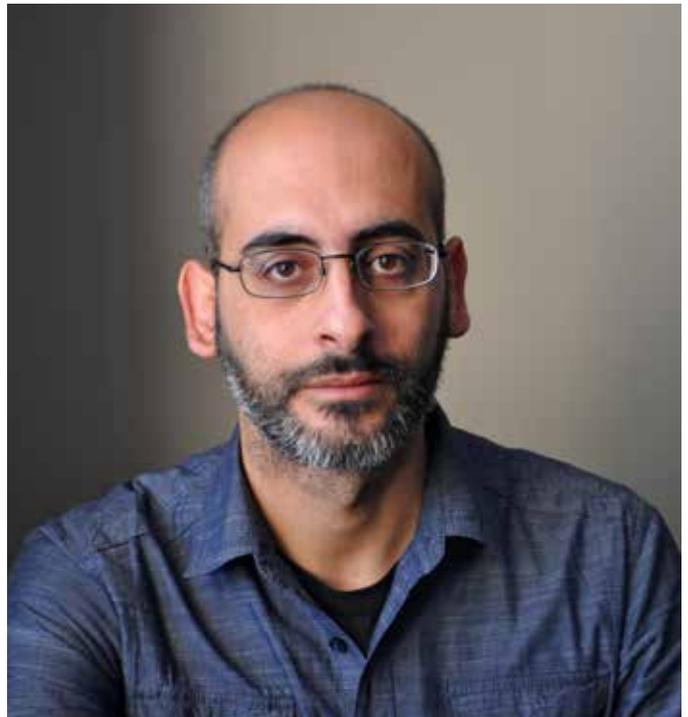
Prof Raftery completed his degrees in Mathematics up until his PhD, at the University of Natal.

His main research interests include Logic, Algebraic Logic, Algebra and Universal Algebra. Prof Raftery has been a member of the Editorial Board of *Algebra Universalis*, since 2005. In 2006, he was Joint Editor of the special issue of *Studia Logica*, in memory of W J Blok.

Prof Raftery started his research career as a classical algebraist (specialising in the theory of Mathematical Rings and Modules). He subsequently developed interests in Logic and Universal Algebra. In recent years, his research has dealt mainly with the use of algebraic methods in logic. There are two aspects to this work. Firstly, the concrete aspect, where algebraic methods are used in the analysis of particular deductive systems (such as intuitionistic, modal, linear, or sub structural logics), sometimes yielding solutions to logical problems which had resisted other approaches. This frequently reduces to discovering facts about mathematical objects, called "residual structures". Secondly, the study of deductive systems in general, and the identification of key properties which make them susceptible, to varying degrees, to algebraic treatment. This area of activity is now called "Abstract Algebraic Logic". In both endeavours, the methods of Universal Algebra are widely applicable. Furthermore, the logics (other than classical logic) to which these methods apply, have an impact on diverse fields, such as Computer Science, Linguistics, Philosophy and Mathematics itself.



Prof James Raftery



Prof Konstantinos Zoubos

Prof Konstantinos Zoubos

Prof Konstantinos Zoubos recently joined the Department of Physics as an Associate Professor.

Prior to his appointment at the University of Pretoria, he was respectively an Associate and Assistant Professor at the Niels Bohr Institute, Copenhagen, Denmark. He was also a postdoctoral researcher at the Niels Bohr Institute and at the Physics Department of Queen Mary University of London, UK.

Prof Zoubos started his studies at the University of Patras, Greece, where he completed his Ptyhio (4-year degree) in Physics. Thereafter he graduated with an MSc in Theoretical Physics at the Imperial College, University of London. In 2004, he completed his PhD degree in Theoretical Physics at the State University of New York, Stony Brook, USA.

He does research within the field of High Energy Theoretical Physics, and is particularly interested in situations where interactions between particles become strong and the usual approximated methods of Quantum Field Theory do not apply. In many of these situations, techniques derived from String Theory, in particular formalism, known as *holography*, which replaces a strongly coupled quantum field theory by a weakly coupled gravitational theory in higher dimensions can be used.

His recent research focused on applying holographic ideas to idealised theories (with the very special property of *integrability*), lower dimensional models (where the gravity theory is generalised to a so-called *higher spin theory*), and to more realistic settings (where the goal was to get a handle on the process of *chiral symmetry breaking* (which is related to one of the greatest theoretical puzzles in particle physics). In short, the question is: How does the mass of the proton arise from the binding energy of its constituent quarks?

Prof Mujahid Abbas

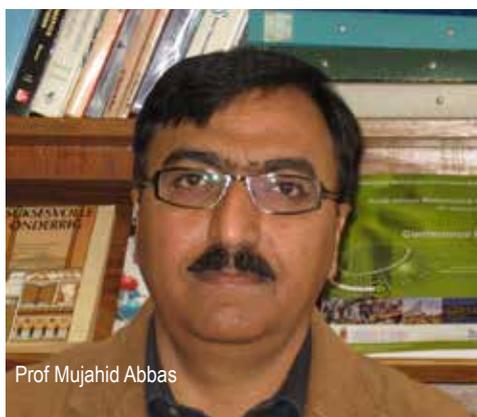
Prof Mujahid Abbas was recently appointed in the Department of Mathematics and Applied Mathematics. He completed his PhD in the field of Functional Analysis (Mathematics). The title of his thesis was *Solution of random operator equations and inclusions*.

From 2006 to 2007 he completed a postdoctoral fellowship at the Indiana University Bloomington, USA. Thereafter, from 2010 to 2011, he completed a second postdoctoral fellowship at the University of Birmingham, UK. He is presently an honorary senior research fellow at the University of Birmingham.

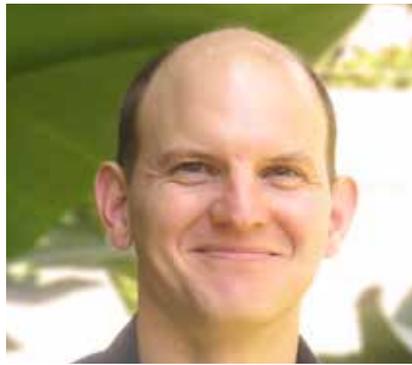
Prof Abbas published two books and produced 170 papers in internationally acclaimed journals. Many of his publications can be used as a benchmark. His research presents quality and a variety, where the interdisciplinary nature thereof is clearly visible. He supervised many students at master's and PhD level and has many more students working under his supervision. Prof Abbas is also a reviewer for the American Mathematical Society. He is serving as a consultant in different projects, sponsored by the King Fahd University of Petroleum and Minerals, Saudi Arabia.

He received three consecutive research productivity awards from the Council of Science and Technology of the government of Pakistan. The Pakistan Academy of Sciences also awarded him a gold medal in recognition of his valuable contribution in his area of research. He presented the results of his research at different seminars and conferences in several countries, including UK, Italy, Jordan, Saudi Arabia, Thailand, Korea and the USA. Prof Abbas is also a member of the Editorial Board of the *World Scientific Journal*, by Hindawi Publishing.

His areas of interests include: Fixed-point Theory and its Applications, Topological Vector Spaces and Nonlinear Operators, Best Approximations, Fuzzy Logic and Convex Optimization Theory.



Prof Mujahid Abbas



Dr Peter le Roux

Plant Science welcomes two new "Green" lecturers

The Department of Plant Science is very fortunate to welcome not only one, but two new lecturers in Ecology this year, namely Dr Michelle Greve and Dr Peter le Roux.

Dr Peter le Roux completed his BSc (Ecology) cum laude at the University of Pretoria in 2000 and his BSc (Hons) cum laude in 2001. From Pretoria he moved to the University of Stellenbosch, where he completed his MSc and PhD studies under the guidance of Prof Melodie McGeoch. His MSc study was on *Azorella selago* (Apiaceae) as a model for examining climate change effects in the sub-Antarctic and his PhD was on climate change and vascular plant species interactions on sub-Antarctic Marion Island. He also did a postdoctoral fellowship from 2009 to 2011 at the Centre for Invasion Biology (Stellenbosch University), with Prof Steven Chown and from 2011 to 2013 a postdoctoral fellowship at Helsinki University, with Prof Miska Luoto.

His broad research interest is community ecology, with particular attention to interspecific interactions, the impacts of global environmental change, and how the former mediates the impacts of the latter. His research goal is to improve our understanding of what determines species' fine- and coarse-scale distributions and the composition of communities, with the aim of applying this knowledge to understanding the ecological impacts of changes in environmental conditions. Much of his research was conducted in collaboration with scientists from

other fields, and he is particularly interested in the potential for incorporating more physiology, physical geography and micro-climatology into ecology.

Dr Michelle Greve obtained her BSc degree in Biodiversity and Ecology cum laude at the University of Stellenbosch in 2002 and her BSc Hons degree in Zoology cum laude in 2003. Her topic was the nestedness on Southern Ocean Islands, measured with a new metric, under the guidance of Prof Steven Chown. She obtained her MSc degree in Zoology at the same university, under the supervision of Prof Steven Chown. The topic of her research was the avifaunal responses to environmental conditions and land-use changes in South Africa, considering diversity, composition and body size. She successfully completed her PhD in the Department of Bioscience at Aarhus University in Denmark, under the supervision of Prof Jens-Christian Svenning and Anne Mette Lykke, on the distribution patterns of African vegetation and flora. She was employed as a postdoctoral fellow at this university, under the supervision of Prof Trine Bilde, where she studied the evolutionary effects of inbreeding on fitness – using physiological tolerances of *Stegodyphus* spiders as a model system.



Dr Michelle Greve

Her main research interest revolves around the reason why organisms occur where they do, which means what processes and events predict their distribution and diversity patterns, and also how current and future threats affect these. Much of her research focused on these questions from a macroecological perspective. She recently started delving into the interface between physiological tolerance and macroecological distribution patterns. Her research spanned a number of systems and taxa, including plants and animals of Southern Ocean islands, birds of South Africa, the ecophysiology of inbred social spiders, and African vegetation and plant distribution patterns.

Internationally acclaimed geologist retires

Despite all the accolades and international awards he received during his illustrious career, Prof Pat Eriksson is still a very humble man. Prof Eriksson will retire at the end of 2013, after serving as the Head of the Department of Geology for seven years, and for more than thirty years as a renowned academic in Geology.

Some of the awards that confirmed and celebrated his excellence as an academic and researcher of international calibre include the 2009 Continental Scientist Award of the African Union in 2009, the National Science and Technology Forum's Lifetime Achievement Award in 2010, as well as the 2012 Earth Sciences Award of TWAS (World Academy of Science).

Prof Eriksson was also the recipient of the National Research Foundation President's Award in 2007, as well as the Fellowship Award of the Geological Society of Africa and the South Africa Medal of the Southern African Association for the Advancement of Science, both in 2008.

He has also been an "Outstanding Academic Achiever" of the University of Pretoria (UP) since 1999, and his awards

include the Medal for Academic Excellence, the Centenary Research Medal, and the Chancellor's Award for Research (all from UP).

Prof Eriksson obtained his BSc (Geology) from the University of Natal in 1974, after which he worked as an exploration geologist for Anglo American in Namaqualand for two years. He returned to the University of Natal (now the University of KwaZulu-Natal) in 1977, where he obtained his Honours

(Geology) degree, followed by an MSc (1979) and a PhD (1984). In July 1982 Prof Eriksson joined the UP Department of Geology as a lecturer, and was promoted through the ranks, becoming professor in 1994. In 1998 he obtained the *Dr rer nat habil* (higher doctorate) from Ludwig-Maximilians-University in Munich, Germany. In December 2006, he was appointed as the Head of the Department of Geology, and in June 2008 as acting Chair

of the School of Physical Sciences (a position he held until the end of 2009).

Prof Eriksson taught sedimentology, basin analysis, historical geology and crustal evolution from 1982 until 2006, and currently lectures in the first two subjects. He is author and co-author of 205 scientific papers and book contributions, and co-edited two books (both published by Elsevier Science): *The Precambrian Earth: tempos and events* (2004), and *Atlas of Microbial Mat Features preserved within the Siliciclastic Rock Record* (2007).

He is currently editor-in-chief of the *Journal of African Earth Sciences* and associate editor of the journals: *Gondwana Research*, and *Marine*

and *Petroleum Geology* and is also a board member of *Sedimentary Geology*. He is a Fellow of the Geological Society of South Africa, a Fellow of the Royal Society of South Africa, and also a member of the New York Academy of Sciences and of the Academy of Science of South Africa.

Most importantly, Prof Eriksson is married to Marianne, talented artist and writer of children's books.



Prof Pat Eriksson



Prof Casper Schutte

Final farewell to well-known scientist

Prof Casper Schutte, an Extraordinary Professor in the Department of Chemistry at the University of Pretoria (UP), and associated with the Institute for Advanced Studies, passed away on 29 July this year. He is survived by his wife, Roswitha, three children and eight grandchildren.

Prof Schutte was born in Steytleville on 30 October 1934. His career in natural sciences stretched over more than 50 years. He obtained the degrees BSc and BSc Honours in Chemistry at the University of North West, and also obtained the Dr Math et Phys degree at the University of Amsterdam in 1960.

He was previously employed by the North-West University, the CSIR, the University of South Africa (Unisa) and the University of Pretoria. Prof Schutte was a former Professor in Physical Chemistry and also Dean of the Faculty of Natural Sciences at Unisa and retired as Chief Executive Director Science, Technology and Information Science at Unisa.

In January 2005 Prof Schutte was appointed as Honorary Professor and in January 2008, as Extraordinary Professor in Chemistry at UP, as well as a member of the UP Centre for Advanced Research. He mentored numerous students' studies in Chemistry at UP and also focused on the use of quantum theory and the structure of matter. Prof Schutte acted as supervisor or co-supervisor for over 30 PhD and 20 MSc students and published more than 75 research articles in international natural science journals. He authored three textbooks and 19 publications in education and information technology. His lectures on the art and science of the antique Egypt era were extremely popular.

Prof Schutte was President of the South African Chemical Institute (SACI) for two terms and recipient of the James Moir commemorative medal, as well as the Raikes medal of SACI. He was the president of the Joint Council for Scientific Organisations of South Africa, as well as the Chair of the Chemistry Section of the Suid-Afrikaanse Akademie vir Wetenskap en Kuns (South African Academy for Science and Art). The Havenga Prize for Chemistry was also awarded to him.

His selfless and enthusiastic involvement with science in South Africa was an exceptional gift. His astute and accurate summary of a number of academic matters frequently went hand in hand with humour. He was an exceptional role model and inspiration for many natural scientists, young and old.

Renowned Professor in Organic Chemistry passed away

Prof Robert Vleggaar, professor and former Head of the Department of Chemistry passed away on 4 November 2013. He is survived by his wife, Connie, two children and three grandchildren.

Robert Vleggaar was a professor of Organic Chemistry at the University of Pretoria (UP) and he was the Head of the Department of Chemistry at UP from 2008 until 2010. Since then he was on contract to lead the Organic Chemistry Division until the end of 2013.

He was born in Rotterdam, but the family immigrated to South Africa shortly after his birth. In 1965 he completed his BSc degree (Chemistry and Mathematics) at UP. In 1966 he was appointed as a technical assistant in the Department of Organic Chemistry at the University and in 1967 he completed his BSc honours degree in Chemistry. From 1969 until 1972 he worked as a research assistant in the Department of Organic Chemistry, while furthering his studies.

Prof Vleggaar obtained his MSc degree (Organic Chemistry) in 1970, followed by his DSc degree in 1972. In the same year he joined the Organic Chemistry Division of the Council for Scientific and Industrial Research's

(CSIRs) National Chemical Research Laboratory as senior specialist researcher. He focused on research involving the structure elucidation, biosynthesis and analysis of physiologically-active fungal metabolites, the so-called mycotoxins. In 1986, Prof Vleggaar was appointed as research leader of the bioorganic chemistry group in the division and in 1987 as acting divisional head. In



Prof Robert Vleggaar

1975, he left South Africa to take up a postdoctoral fellowship at Cambridge University to study the stereo specificity of enzyme-mediated reactions.

He joined the newly-formed Division for Food Science and Technology at the CSIR in 1987 as Programme Manager: Food and Agricultural Chemicals. In 1990 he was appointed as professor of Organic Chemistry in the Department of Chemistry at UP – a position he retained till his untimely death. Prof Vleggaar was a member of the Royal Society of Chemistry, United Kingdom (UK), a member of the South African Chemical Institute and served as Chairperson of the Pretoria branch from 1985 to 1986. He was also a member of the American Chemical Society. Prof Vleggaar has authored or co-authored more than 128 scientific articles. The impact of his work is reflected by an impressive ISI H-factor of 27. During the centenary celebrations in 2008, his name was listed in the list of honour of the hundred most prominent researchers in the University's existence.



Learners attending the Career and Bursary Fair in August this year and learning more about the agricultural sector.

Career and Bursary Fair showcases opportunities in agriculture

“One of the success stories of the annual Career and Bursary Fair hosted at the University of Pretoria (UP), is a significant increase in student numbers in the ‘scarce skills’ fields of study, such as horticulture, plant production, soil science and plant pathology.”

According to Dr Diana Marais, Senior Lecturer at the Department of Plant Production and Soil Science, during the past two years their Department experienced a significant increase in the number of enrolled second-year students who selected plant production and soil science. “Most amazing was the significant increase in the number of honours students in plant production and soil science. These increased numbers are a direct result of the Career Fairs,” Dr Marais confirmed.

The third Career and Bursary Fair held on the Hatfield Campus in August this year was an initiative of the Produce Marketing Association (PMA), an international industry organisation for the fresh produce industry in partnership with UP’s Faculty of Natural and Agricultural Sciences. The

Career Fairs (at UP and the University of Stellenbosch) started in 2011 as a result of the request of industry players who requested that “we must show-case the industry to young people to promote the exciting career opportunities in the agricultural and food supply chain.”

More than 4 000 students and scholars attended this year’s Career and Bursary Fair. With the entire supply chain in fresh produce represented, students and learners were exposed to a variety of career opportunities. Mr Johan du Plessis, Human Resource Manager from ZZ2, a large commercial farming operation said: “I was astonished to see how many students showed an interest in what we do. At ZZ2 we have opportunities across the supply chain; it was therefore an eye-opener for us to speak to so many prospective students.”

Some of the companies attending the Career Fair include Bayer, Citrus Academy, Fruit & Veg City, John Deere, McCain, Monsanto, Pioneer Foods, Potatoes SA, Santam Agri, Shoprite/Freshmark, Woolworths, ZZ2 and many others.



Students discovering more about a career in the agricultural industry.

Early Spring Mathematics Morning open to everyone

The Department of Mathematics and Applied Mathematics welcomed the long anticipated seasonal change with its Early Spring Mathematics Morning at the beginning of August. This was the seventh such annual event where the Department opens its doors to visitors from all over and invites a speaker that appeals to all. This year's speaker par excellence was grandmaster Kevin Horsley, who is an expert in memorisation techniques. He is someone who is able to recite the first ten thousand digits of the number pi. His topic "You are a lot smarter than you think" attracted wide interest and the packed audience was entertained, informed and delighted.

Kevin impressed the audience from the onset,



From left: Eloise Cooper (Kevin's assistant), Dr Quay van der Hoff, Grandmaster Kevin Horsley and Prof Ansie Harding (organiser)

by letting them generate a sixty digit number which he memorised in twenty seconds, reciting it fluently and repeating it backwards with the same ease. He was generous and humorous in sharing techniques on how to improve one's memory. He demonstrated this by showing the audience how to memorise the names of the first 20 presidents

of the United States of America, all done with the greatest of ease.

The morning concluded in the luscious garden of the Department of Mathematics, where guests could experience the hospitality of the Department and meet Kevin Horsley in person.



First Teaching and Learning Day on Mamelodi Campus

In September this year staff members teaching in the University of Pretoria (UP)'s Four-year programmes and ENGAGE programme had the opportunity to discuss and exchange thoughts about their experiences and teaching practices at the first Teaching and Learning Day on the Mamelodi Campus. It is foreseen that this day will become an annual event.

UP currently presents five programmes that are funded by a provision grant of the Department of Higher Education and Training (DHET) Foundation. These include the Four-year programmes for BSc, BSc (IT), BIS Multimedia and BCom, as well the ENGAGE programme offered by the Faculty of Engineering, Build Environment and Information Technology.

According to Dr Quenton Kritzing, Director of the UP Four-year Programme, "staff members seldom get the opportunity to discuss and exchange thoughts about their experiences and teaching practices, even with staff within the same programme, due to the intensive nature of the programmes. The need exists for staff members to discuss and share

their teaching experiences in the extended programmes," Dr Kritzing emphasised.

Dr Kritzing also explained that staff members use different methods and strategies in their teaching that could be of value to others. Therefore, this initiative will provide a platform to share these strategies with their fellow colleagues. This Teaching and Learning Day will provide a dedicated period of time for staff within these programmes to share their experiences and practices on teaching and learning, and also to share their research activities (and the different theories they use in the process) with other staff members. Through this we want to facilitate communication between the different extended programmes at UP and to promote development of staff in terms of scholarship of teaching and learning.

Prof Marietjie Potgieter, Deputy Dean: Teaching and Learning in the Faculty of Natural and Agricultural Sciences delivered the opening address on the topic *Overconfidence: Both a virtue and a vice*.

International Chemistry Conference assists with sustainable growth

As the demands of the global – and rapidly growing – middle-class spiral upwards, the challenges of climate change and ocean degradation to our planet dominate. But we also face the challenges of maintaining sustainable food, mineral, freshwater and energy supplies at an economically affordable cost. Prof Sir David King shared his view on this topic in the plenary opening lecture, entitled *Improving human well-being on a resource-limited planet – can we do it?* at the 12th International Chemistry Conference Africa (ICCA) 2013.

The 12th ICCA was held at the University of Pretoria (UP) from 8 to 12 July 2013 and was jointly organised by the University of South Africa, UP and Tshwane University of Technology.

Prof Sir David King is the Chair of Future Cities Catapult, Chancellor of the University of Liverpool, Senior Scientific Advisor to UBS, Adviser to President Kagame of Rwanda, and Director of Cambridge Kaspakas. He serves

as Chair of the UK National Oceanography Advisory Board, as Council Member of the Ditchley Foundation, and as NED of Midatech Limited.

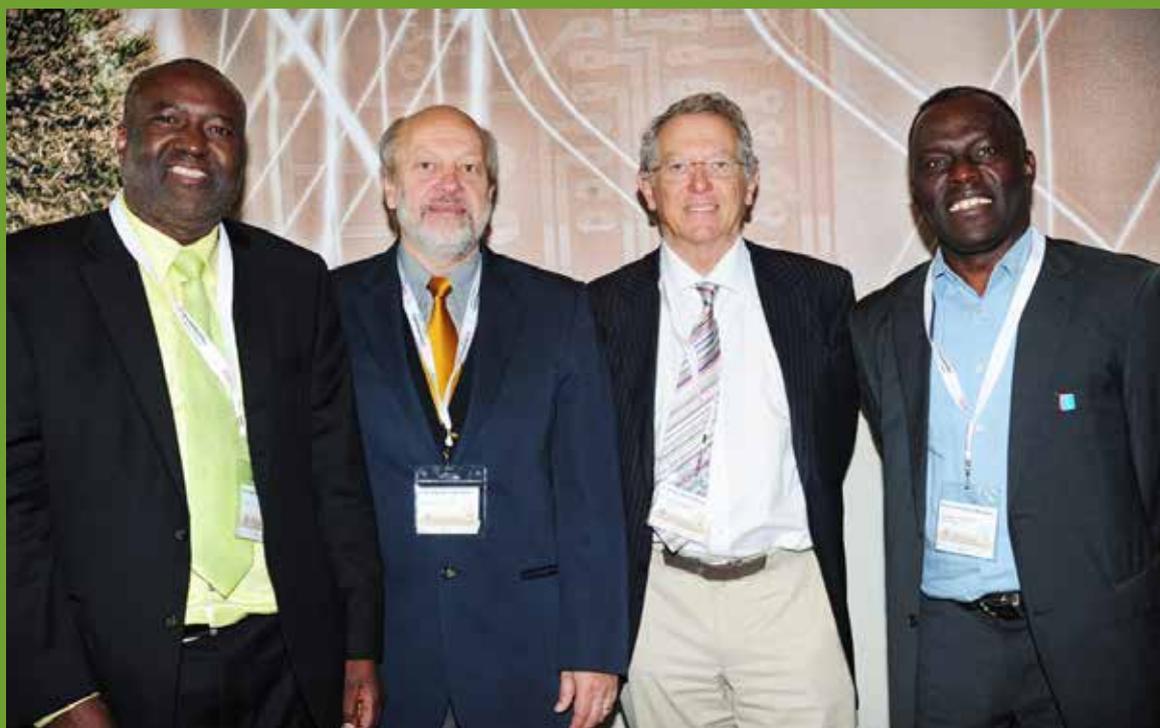
He was the UK Government Chief Scientific Adviser from 2000 to 2007. He raised the need for governments to act on climate change and was instrumental in creating the new £1 billion Energy Technologies Institute. He created an in-depth futures process which advised government on a wide range of long term issues, from flooding to obesity.

Prof Sir King has published over 500 papers on surface science and catalysis and on science and policy, for which he has received many awards, medals etc. He was also Elected Fellow of the Royal Society in 1991, Foreign Fellow of the American Academy of Arts and Sciences in 2002, knighted in 2003, and made "Officier dans l'ordre national de la Légion d'Honneur" in 2009.

Over the years, the ICCA has grown to

become one of the most exciting and well attended meetings in Africa, dedicated to the field of chemistry and related disciplines. This international meeting, in its multi-disciplinary nature, brings together Africa's own renowned scientists as well as other world leading authorities to address the practical aspects of chemistry that include analytical, environmental, organic, inorganic and physical chemistry, chemical education, biochemistry, chemical engineering and other related disciplines.

The conference consisted of plenary, keynote lectures and an extensive technical programme of lecture and poster presentations. All these focus on providing practical solutions that address the diverse challenges faced by Africa. ICCA provides an ideal platform for most companies to showcase scientific and technical innovation of laboratory equipment and new products. Companies were therefore invited to exhibit their commercial products, as this was an ideal opportunity to engage in the business pursue laboratory equipment.



From left: Prof Matthew Nindi (Unisa and Chairperson of the ICCA organising committee), Prof Egmont Rohwer (Head of the Department of Chemistry at UP and a member of the ICCA organising committee), Prof Sir David King and Prof Jonathan Okonkwo (TUT).

Photo by: ChilliPix



Prof Michael Greenacre at the piano performing one of his statistical songs.

Lively celebration of World Year of Statistics

Who said that statistics is boring? Definitely no-one at the University of Pretoria (UP). This is indicated by the lively manner this field of study was celebrated at the University during October this year. A gala event was held in the foyer of the Aula, to celebrate the World Year of Statistics, a global initiative launched by the American Statistical Association (ASA).

Prof Michael Greenacre, an acclaimed statistician from the Universitat Pompeu Fabra in Barcelona, Spain, captured the guest's attention with an academic address combined with a piano recital. Everyone was carried away by the manner in which Prof Greenacre presented an insightful and applicable view on statistics, while expertly playing the piano.

The aim was to promote awareness and the importance of statistics across many fields, as well as in the daily lives of everyone associated with UP. Several dignitaries from the University, as well as the SAS Institute, Statistics South Africa, the National Research Foundation, and various other companies and representatives from industry attended the occasion.



Prof Cheryl de la Rey (Vice-Chancellor and Rector), Mr Pali Lehohla (Statistician-General, StatsSA), Prof Andriëtte Bekker (Head: Department of Statistics) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences).

Another important part of the celebrations was the prize-giving ceremony of the WYSUP 2013 competition. The competition, with the theme *Unexpected Statistics* was launched by the Department of Statistics at the beginning of this year. Entries had to be visual in nature and exhibit statistics in a relevant way.



Mr Murray de Villiers (General Manager: SAS Southern Africa), Mr Desan Naidoo (Managing Director: SAS Southern Africa) and Ms Micheale Giocovazzi (1st prize winner of the WYSUP2013 competition).

The entry of Ms Michaela Giocovazzi, a second-year BSc Actuarial Science student, was considered the best and she won the first prize of R15 000, sponsored by the SAS Institute. Ms Giocovazzi's entry was a canvas, the size of a door, with over 1 000 white folded paper (origami) shirts glued to it. Among the white shirts was a single red shirt, representing the unexpected statistic.

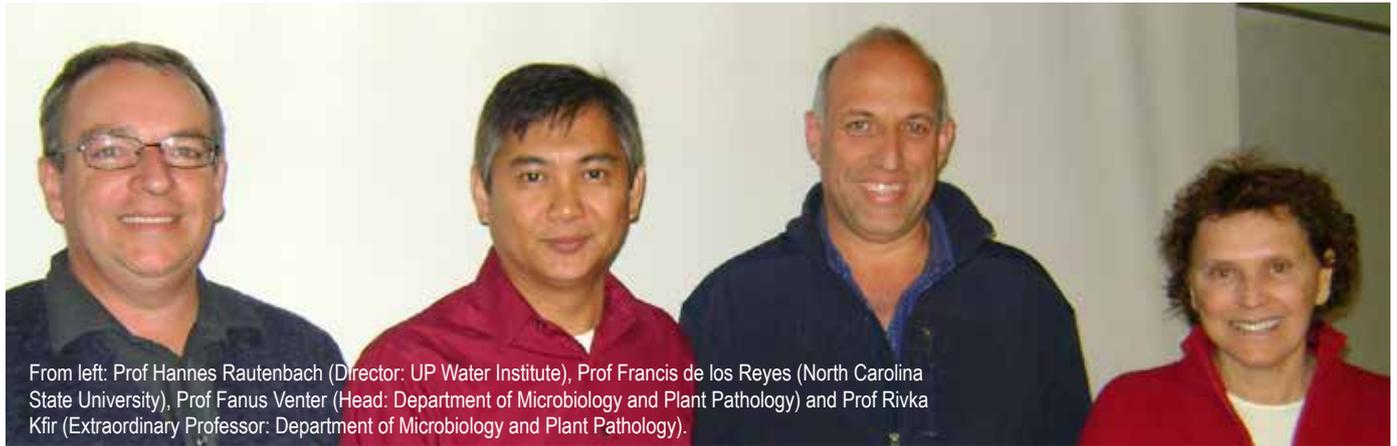
What is living in our water?

Prof Francis de los Reyes from the Department of Civil, Construction and Environmental Engineering at the North Carolina State University recently visited the University of Pretoria (UP) Water Institute to share his in-depth knowledge on molecular microbial ecology and its role in wastewater treatment.

During his visit, Prof De los Reyes presented an open lecture with the title: *Who's there and what are they doing?* In his research and teaching,

Prof De los Reyes focusses on aspects related to wastewater treatment, molecular microbial ecology of contaminant removal from solid and liquid wastes, as well as water and sanitation for developing countries. With his university qualifications in Agricultural Engineering, Civil Engineering and Environmental Engineering, Prof De los Reyes has a broad knowledge in the field of wastewater treatment. His work ranges from applications in rural areas, to detailed scientific

analyses of microbial characteristics and activities in water wastes. He worked as consultant and visiting scientist, with municipalities, research institutions and stakeholders in the United States of America, China, Montenegro and the Philippines. He was particularly interested in research in the Department of Microbiology and Plant Pathology, as well as the Water Utilisation Division in the Department of Chemical Engineering at UP.



From left: Prof Hannes Rautenbach (Director: UP Water Institute), Prof Francis de los Reyes (North Carolina State University), Prof Fanus Venter (Head: Department of Microbiology and Plant Pathology) and Prof Rivka Kfir (Extraordinary Professor: Department of Microbiology and Plant Pathology).

Workshops and Events

Pretoria's fountains celebrated in new coffee-table book

The welcoming springs at the south entrance to the city of Pretoria, commonly known as 'The Fountains', are more than a spectacular water feature. In fact, they have been supplying Pretoria with water for almost 160 years.

To highlight the importance of groundwater for urban areas, a coffee-table book titled *Pretoria's Fountains – Arteries of Life* was launched earlier this year at the University of Pretoria (UP). This book is the culmination of the Hydrological Heritage Overview project, funded by the Water Research Commission (WRC) and led by UP. The book is also available in electronic format on a DVD, which includes a short film.

The book elaborates on the development of Pretoria, as dictated by its water supply. It provides information on historical abstraction volumes and water quality, and emphasises the need for the preservation of the city's natural groundwater resources.

According to project leader, Matthys Dippenaar of the Department of Geology, the city of Pretoria was founded in the immediate vicinity of an unusually strong and consistent artesian water source, which exclusively supplied Pretoria with water from 1855 until 1935. The quality of the city's springwater is still exceptionally high and treatment is not required. "Groundwater is better protected against contamination, evaporation losses and droughts than surface water, making it a viable, yet underappreciated natural resource," he explained.

Speakers at the launch included Prof Louis van Rooy of the Department of Geology at UP, Mr Dhesigen Naidoo, CEO of the Water Research Commission (WRC) and Prof Cheryl de la Rey, Vice-Chancellor and Principal of the University. They all stressed the importance of water-related research and public awareness, as well as the need for close collaboration between all the partners in the chain, namely universities, government, governing bodies and the public.

Mr Dippenaar said that the aim with the project was to create awareness around the importance of groundwater and appreciation for our groundwater sources. "We are thankful to the City of Tshwane who provided us with all the available historical information and maps required for the project. We hope to continue our work and do a series of projects on the main urban nodes, such as Cape Town and Johannesburg, in the future."



Prof Cheryl de la Rey (Vice-Chancellor and Principal: UP), Dr Shafick Adams (Research Manager: WRC), Mr Matthys Dippenaar (UP Project Leader) and Mr Dhesigen Naidoo (CEO: WRC).

LaRSSA contributes to land rehabilitation in South Africa

The topic of land rehabilitation in South Africa nowadays features regularly in the media. Dr Wayne Truter from the Department of Plant Production and Soil Science has been involved in this discipline for the past 15 years, doing research and in an advisory capacity.

Dr Truter's involvement in this discipline confronted him with the same questions and challenges which many other stakeholders have also experienced.

"Land rehabilitation is regarded as a multi-disciplinary

field. Therefore there are many stakeholders to address all the issues in this field. A need developed to accumulate valuable information and experiences from representatives of academia, research,

industry, consultants, government and implementing agencies in this integrated discipline, on a neutral platform," Dr Truter said.

As a result of his close relationship with industry and other stakeholders, he approached key role-players in this field. Consequently a non-profit organisation, the Land Rehabilitation Society of Southern Africa (LaRSSA), was established in 2012. LaRSSA aims to provide all stakeholders in this discipline the opportunity to collaborate with each other and to achieve more successful and sustainable rehabilitation of degraded and impacted land. The Society also strives to leave a rich legacy of responsible environmental rehabilitation and to ensure a secure environment from which our country's

children and their descendants can benefit.

LaRSSA is currently led by Dr Truter, as the first President of LaRSSA and focuses on providing stakeholders with land rehabilitation discussion forums and the provision of a platform for relevant capacity building of land rehabilitation best practices. This will be achieved by hosting various technical field workshops and an annual conference where scientific research, case studies,

as well as success and non-success stories can be shared.

A further highlight for LaRSSA was their first Annual Conference with the theme *The Status Quo of Land Rehabilitation in Southern Africa* which was held in October this year.

This conference achieved international recognition with the participation of two acclaimed land rehabilitation experts for the keynote presentations. Prof David Tongway, widely known as the father of landscape function assessment from the CSIRO, and a land rehabilitation geochemistry heavyweight, together with Prof Martin Fey, recently from the University of Western Australia, and currently Extraordinary Professor in the Department of Plant Production and Soil Science at UP, delivered the keynote presentations, sharing their vast knowledge of international land rehabilitation.

For more information regarding LaRSSA, please visit www.LaRSSA.co.za or contact LaRSSA's administrator on admin@LaRSSA.co.za or at 072 808 6379.



Dr Wayne Truter

Learners learn about Wireless Technologies

Learners from grade 8 to grade 10 recently had the opportunity to attend a talk by Prof Saurabh Sinha from the Electronics and Microelectronics Group at the University, presented at Sci-Enza. The topic of his talk was *A new communication wave for integrated wireless technologies*. Prof Sinha recently received the prestigious NRF's National Science and Technology Forum (NSTF) Award for 2013 in the category, Emerging Researchers, for his outstanding contribution to Science, Engineering, Technology and Innovation. He is an electrical engineer, researcher and educator, and was the South African Institute of Electrical Engineers (SAIEE) Engineer of the Year in 2007.



From left: Mrs Jansie Niehaus (NSTF Executive Director), Prof Saurabh Sinha, Mrs Rudi Horak (Manager: Sci-Enza) and Mrs Helga Nordhoff (UP with Science Programme).



Cape serotine bat (with her twins)

Bat housing project supports environment



Yellow housebat (on the Experimental Farm)

Few people know that the Groenkloof Campus of the University of Pretoria (UP) is the manmade home to the largest colony of Egyptian free-tailed bats (*Tadarida aegyptiaca*) in South Africa.

To highlight this and other fascinating science stories, the UP science centre, Sci-Enza, hosted a media round table event as part of the University's National Science Week initiative which took place this year between 29 July and 4 August this year. This annual, countrywide science celebration was initiated by the Department of Science and Technology (DST).

The audience learned more about the unique situation of thousands of Egyptian free-tailed bats which have made the Groenkloof Campus their

home over the years due to the campus' modern architecture that created an ideal roosting place for these small mammals. Since bats are legally protected in South Africa. The University has to date, spent more than R300 000 to evict this colony of bats from the buildings in an environmental friendly way.

The expertise of the environmental committee of the University, the knowledge of renowned scientist Prof Wanda Markotter and the passion of Mr Nigel Fernsby, a bat expert who assisted the environmental committee to evict the bats, were shared during the event. The event was held at the boma on the Groenkloof Campus where the special new bat houses overlooking the pond are also visible.

During National Science Week in August this year, Sci-Enza also hosted a Science Café on Citizen Science and a public lecture by Prof Les Underhill, Director of the Animal Demography Unit at the University of Cape Town on MammalMAP (the African Mammal Atlas Project) which is considered one of the continent's most important mammal conservation projects. He explained that it is very easy for the public to get involved.



Egyptian free tail bat (on the Groenkloof Campus)

UP academics interact with French-speaking Belgian counterparts

A delegation representing four universities in Belgium (Catholic University of Louvain, Université libre de Bruxelles/Free University of Brussels, University of Liège and University of Mons) recently interacted with University of Pretoria's (UP) academics from various faculties. They were presented with some of the flagship projects currently running in the UP's faculties and the Institutional Research Themes (IRTs).

and to participate in international meetings and events such as visits abroad.

The four universities from Belgium already have existing ties with their South African counterparts – UP included – in areas of research and student and academic mobility. Their cooperation covers a range of subject areas such as engineering, medicine, mathematics, management, economics, education, and law.

Prof Anton Ströh, Dean of the Faculty of Natural and Agricultural Sciences, also reiterated the necessity for more collaboration with the Belgian universities. "In terms of our international strategy, it is important to link with international consortiums such as the CIRI with an objective of taking science to the next level, not only to the benefit of UP but for the country and also for European countries."



From left: Prof Pierre Dehombreux (Professor of Machine Design and Production Engineering, and Vice-Rector of International Relations, University of Mons), Prof Jean Marchal (Professor of Applied Sciences and Vice-Rector of International Relations, University of Liège), Prof Cheryl de la Rey (Vice-Chancellor and Principal, UP), Prof Didier Viviers (Rector: Free University of Brussels), Prof Benoit Macq (Professor of Electrical Engineering, Catholic University of Louvain), Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences, UP), Prof Jan Govaerts (Full Professor of Physics, Catholic University of Louvain), and Prof Bernard Rentier (Rector: University of Liège).

The visiting delegation formed part of the Interuniversity Committee for International Relations (CIRI), which consists of the Rectors, Vice-Rectors and Directors of the International Relations Departments of all the Belgian, French-speaking universities. The main objective of the CIRI is to strengthen a concerted policy of promotion of universities at international level, to share information on the internationalisation of higher education, to develop and implement joint activities and representation at international level,

Prof Dr Bernard Rentier, Rector of the University of Liège, said there was already existing collaboration between the universities in Belgium and five universities in South Africa. He said the scope of this collaboration should be extended and reinforced, which would also amplify the student exchange programmes between the universities. "As the six universities in Belgium, we would like to build up an agreement with UP as we have complementary programmes in a variety of fields like mining, stem cells and genetics and veterinary medicine," he said.

Prof Cheryl de la Rey, UP Vice-Chancellor and Principal, said as part of the University's Strategic Plan, UP 2025, internationalisation was one of the focal points in terms of enhancing its international stature and visibility. "In doing so we focus on activities which stem from our focus as a research-intensive university, to develop joint new proposals to secure funds for collaborative research between us and international individual institutions in relation to a number of key focus areas," she said.

Leaders from Murdoch University liaise with academics



From left: Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences, UP), Prof David Morrison (Deputy Vice-Chancellor: Research, Murdoch University), Prof Benjamin Reilly (Dean, Sir Walter Murdoch Business School Murdoch Business School) and Prof Mike Wingfield (Director: FABI, UP).

Prof David Morrison and Prof Benjamin Reilly from the Murdoch University in Perth, Australia recently visited the University of Pretoria to discuss possible collaboration and research opportunities between the two institutions. As part of their visit they spent time with academics from the Faculty of Natural and Agricultural Sciences and had a luncheon at the Forestry and Agricultural Biotechnology Institute.

Polish Minister visits UP to discuss bilateral cooperation

The Minister of Agriculture and Rural Development from the Republic of Poland, Mr Stanislaw Kalemba, visited the University of Pretoria (UP) on 18 October 2013. The Minister was accompanied by Mr Janusz Związek, Chief Veterinary Surgeon, and Mr Witold Majewski, Political Officer from the Polish Embassy in Pretoria. The delegation met with academics from the Faculty of Natural and Agricultural Sciences and discussed the possibilities of bilateral cooperation between the two countries in the field of higher education and research in agriculture.



From left: Mr Janusz Związek (Chief Veterinary Surgeon), Prof Eddie Webb (Head: Department of Animal and Wildlife Sciences, UP), Prof Johan Annandale (Acting Head: Department of Plant Production and Soil Sciences, UP), Minister Stanislaw Kalemba, Mr Witold Majewski (Political Officer: Polish Embassy) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences).

Nobel Laureate presents seminar at UP

Prof Yuan Tseh Lee, famous Nobel Laureate and President of the International Council for Science (ICSU) recently shared his expertise with South African scientists at the University of Pretoria.

He drew a full house when he presented a seminar in the University's Senate Hall earlier this year.

Prof Lee, a world leader in the field of chemical dynamics, shared his knowledge with lecturers and students in chemistry as well as other departments in the Faculty of Natural and Agricultural Sciences. Senior scientists from other universities also attended. The lecture

was titled *Dynamics of Chemical Reactions and Sustainable Development of Human Society*.

Prof Lee visited South Africa as a guest of the National Research Foundation. As President of the ICSU, he leads a global organisation of 120 international member organisations, representing 140 countries and 31 international scientific unions.

He is acknowledged for his support of integrated research, and for the leading role he has played in transforming scientific research to achieve global sustainability. In 1986, he and his two collaborators, Polanyi and Hersbach, were awarded the Nobel Prize for Chemistry for their work in chemical reaction dynamics.



From left: Prof Debra Meyer (Head: Department of Biochemistry), Prof Yuan Tseh Lee, Prof Egmont Röhwer (Head: Department of Chemistry) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences).

Mathematical genius appointed for Fulbright Foreign Student Program

A real mathematical wizard...

Not only did Henry Thackeray, a BSc Mathematics (honours) student at the University of Pretoria (UP), win the first ever South African Tertiary Mathematics Olympiad (SATMO) in 2012, but he was also appointed as principal candidate for the 2014-2015 Fulbright Foreign Student Program for study in the United States.



Henry Thackeray

Henry's achievement in the Olympiad was especially remarkable with a score of 90%, He beat the others by far, the closest score country-wide being 65%. The Olympiad was written by Mathematics undergraduate students from universities across the country. Henry also received the Dewald Hattingh book prize for the best third-year student in Mathematics for 2012.

His mathematical talents were evident from an early age and Mathematics has remained a source of interest and pleasure into his adult years. He has a history of excelling in Mathematics Olympiads, winning the national Mathematics Olympiad early in his high school years, against considerably more senior competitors, also representing South Africa in the International Mathematics Olympiad, winning a silver medal. Henry's passion for Mathematics has brought many awards and prizes his way since school days, and this trend continues at university. He is currently entering the postgraduate level, where he is positioning himself for a PhD qualification and a research career, investigating problems at the cutting edge of Mathematics.

Apart from graduating from a BSc degree in Mathematics with distinction in 2012, he received the coveted Vice-Chancellor and Principal's Medal for Excellent Undergraduate Academic Achievement. He was also awarded a UP Postgraduate Bursary for 2013 and received Academic Honorary Colours from the Student Representative Council.

Geology student wins big with essay competition

Katlego Magoleng, a final-year Geology student in the Faculty of Natural and Agricultural Sciences, received a plasma TV, DVD and Blackberry mobile phone after winning the competition with his essay. Live Magazine SA / Livity Africa and Metropolitan Life Insurance staged an online essay writing competition. Students from various institutions were invited to submit a piece on the topic *What can be done to help youngsters to stay focused and not to fall sideways?* The prize handover function was held on 22 October this year at the University of Pretoria.



From left: Mr Pierre van der Walt (Business Consultant: Metropolitan), Katlego Magoleng and Prof Denver Hendricks (Director: University Relations, UP).

Animal and Wildlife Sciences awards top students

Top achievers in the Department of Animal and Wildlife Sciences were rewarded for their academic excellence at the annual merit award function earlier this year.



Mr Marius Viljoen from CEVA (guest speaker at the function), Mr Abrie Groenewald (winner of the JJ Veenstra trophy) and Prof Edward Webb (Head of the Department of Animal and Wildlife Sciences).



All the students who received bursaries and awards.

Six companies (Afgri, Bonsmara Breeders Society, CEVA, Philagro, the Protein Research Foundation and Topigs) awarded bursaries to postgraduate students of the Department. These students are currently busy with MSc-projects in different fields of specialisation in animal science, including physiology, nutrition as well as breeding and genetics.

The SASAS Prize for the best BSc(Agric) Animal Science fourth-year student in 2012 was presented to Ms Elna Swart. The SASAS Northern branch Award for the most outstanding BSc(Agric) Animal Science third-year student in Animal Science in 2012 was shared by Ms Elreze Scott and Mr Werner Gericke.

Prof Edward Webb presented the JJ Veenstra Floating Trophy to Mr Abraham Groenewald for the 2012 final-year BSc(Agric) Animal Science student, as the most zealous student.

Three additional departmental bursaries, the Prof DM Joubert-bursary to Ms Belinda de Jong, the Prof JC Bonsma-bursary to Ms Rulien Grobler and the Prof C Maree-bursary to Ms Marthie Nickols were also awarded at the function.

67 Minutes of fun science for Mandela Day

Not many children look forward to 67 minutes of science, but the children of Thohoyandou Primary School experienced the fun side of science this Mandela Day.

Sci-Enza, the University of Pretoria's Science Centre, joined *Pretoria News*, Lead SA and numerous other entities in donating their 67 minutes at the school in Saulsville. In between all the hustle and bustle at the school (which included Generations actors and Idols celebrities, as well as food and gifts for the school, from numerous organisations), staff from the Science Centre presented a science show to the Grade 7 children and a rocket-making workshop wrapped up the day's proceedings.

Three young scientists from the University, Ashlan, Justice and Rodney gave 67 minutes of their time to inspire and enthuse these kids about physics. One of the highlights for the facilitators

was the involvement and excitement of the children. Irene Schoeman from Sci-Enza said: "I love it to see that science is just as entertaining as all the other things going on here. There are so many thrilling things competing for their attention, but the science fascinated them. We had a captivated audience for the entire show."

This is true, since even the tempting party packs brought into the classroom halfway through the show did not make the children lose focus. Nelson Mandela believes strongly in the value of education and we hope that memories of this day will spark interest and fuel ambition in these children to follow careers in science.



Children of Thohoyandou Primary School experienced the fun side of science this Mandela Day.



Animal Science students (Paul, Herman, Suné, Divan and Casey) with the learners from the Pretoria School for Cerebral Palsied, Physically and Learning Disabled Learners.

Farm animals change lives of children with disabilities

On 14 August 2013 an ewe, a lamb and five optimistic students from the Department of Animal and Wildlife Sciences visited the Pretoria School for Cerebral Palsied, Physically and Learning Disabled Learners, as well as the Word Alive Christian Pre-school & Daycare, as part of a community outreach.

This visit was of an educational nature, since these children (aged two to seven) learn about farm animals at school, but have no means or opportunity to witness any of these animals up close and personal. Limited funds, transport and individual needs of each child with a disability from the Pretoria School also make excursions difficult, since most of them are wheelchair bound, or require wheelchairs for any prospective excursion. "The children enjoyed the interaction with the sheep immensely and the feeding and petting of sheep was the cause of a lot of excitement. It was a truly memorable day and we hope this long-term community project will continue to have the same positive effect in the years to come," said Suné Myburgh, an MSc Animal Sciences student.

Special thanks must be given to the Animal Science students who assisted the Hatfield

Experimental Farm, the Department of Animal and Wildlife Sciences, the Ethics Committee, as well as the marketing staff of the Faculty of Natural and Agricultural Sciences, for making this day possible.

The last and final recognition, however, must definitely be given to the ewe and her lamb, true Tukkies, which were at their best behaviour and changed a child's life forever!



Learners enjoying the interaction with the sheep.



Byron the cheetah allowed children to pat and to stroke him during his visit to Sci-Enza.

Cheetah and helicopters teach children about science

Although cheetahs are the fastest running animals on land, Byron the cheetah sat down very calmly and allowed children to pat and to stroke him during his visit to Sci-Enza. His visit formed part of Sci-Enza's popular Science-is-Fun holiday programme during the 2013 winter holiday for primary school learners.

Byron, who is from the Ann van Dyk Cheetah Centre, is part of its outreach programme to teach children about animal conservation. Faith Rabanyane, an environmental education officer shared some facts about cheetahs,

including that the mantle of the cheetah cub mimics the back of a badger as a camouflage technique to protect the cubs from predators. The children were in awe and as Dirk (11) said: "It was freaky in the beginning to see a cheetah so close, but it was wonderful to touch it".

Rita Groenewald, Byrons's handler also made an appeal to the public to sponsor underprivileged children to enable them to visit to the Cheetah Centre.

During the rest of the holiday programme, children had the opportunity to learn about the science of construction in a fun way. They discovered more about skyscrapers, nests, bridges and bee hives – these are some of the strong structures around us. Mr Hideo Nakano, a senior volunteer from the Japan International Co-operation Agency showed the children how to build their own amazing toys, amongst others, a helicopter (Zamcopter) from ordinary things such as plastic bottles, paperclips and a rubber band. Visit http://zamcopter.web.fc2.com/rb_helicopter.htm to learn more.

Sci-Enza is the oldest interactive Science Centre in South Africa. It started in 1977 as an open "laboratory" in the old Physics Building by Prof Lötz Strauss, a professor in the Department of Physics. This open "laboratory" gave students the opportunity to "play" with scientific apparatus in an informal setting. Since 2005 the centre's name was changed to Sci-Enza. The name is a combination of the word "science" and the isiZulu word "sebenza", meaning "work" or "to do".



Hideo Nakano showed the children how to build their own amazing toys.

Brainy Chemistry student also MasterChef

Leandri van der Wat, an MSc student in Analytical Chemistry in the Faculty of Natural and Agricultural Sciences, was the runner-up in this year's MasterChef South Africa competition, Season 2. She received R100 000 cash.

She is not only a MasterChef, but also did exceptionally well in her studies up to now. At the recent Annual Top Achievers function in the Faculty, she received the Bruker Prize for the best honours student in Physical Chemistry, as well as the Merck Prize and Sasol Prize for the best achievements in Chemistry on honours level respectively.



Leandri (left) and her sister, Seline van der Wat (UP Industrial Engineering graduate) with the Vice-Chancellor and Principal, Prof Cheryl de la Rey (middle) on Spring Day this year. The two sisters made it to the final stages of MasterChef and were also judges of the braai competition at the annual Spring Day.

Chemistry skills have proven to be very useful in creating amazing, complex food dishes. Prof Egmont Rohwer, Head of the Department of Chemistry said that the Department is very proud of Leandri and "you're a star, thanks for the good publicity you give to Chemistry."

Leandri will use her prize money for humanitarian purposes – she will pay for a hip operation of the four-year old Maria Zignia from an orphanage in Maforga, Mozambique.

Bloodhound SuperSonic Car driving experience at Sci-Enza

Learners and students recently had the opportunity to get a glimpse of how it feels to drive at a speed of more than 1 600 kph.

The Bloodhound SSC Education Programme Team presented its Bloodhound Driving Experience (BDE) during October at Sci-Enza, the University's Science Centre.

The Bloodhound SuperSonic Car (SSC) project is the UK's latest attempt to break the world land speed record, with a car capable of travelling at an amazing 1 610 kph. The Bloodhound Driving Experience (BDE) provides a good overview of the process that Andy Green will have to endure when driving Bloodhound SSC at speeds approaching 1 650kph and then – more importantly – to bring the car to a safe halt within the available 9km of Hakskeenpan.

The controls and instrumentation is a very accurate copy of what the driver (Andy) will see in his composite monocoque on board the car. The only difference is one will not need to endure the positive (+2) or negative (-3) gravitation (g) force when the driver accelerates and decelerates during the two-minute ride that will cover 20 km of the dried lake bed in the Northern Cape Province.

A public talk about the Bloodhound SSC and this spectacular feat of engineering was also presented later the same day.

Aniceta Brügger, a first-year BSc Biological Sciences student had the opportunity to drive the Bloodhound Supersonic Car. "It was an experience of a life-time, nerve wrecking," she said.



Aniceta Brügger driving the Bloodhound Supersonic Car.

Importance of food security discussed in Addis Ababa

Food Security is currently the centre-stage for national and international attention and development debates, but there is a dire international lack of capacity in this new field of expertise. It is a complex societal problem with few clear solutions and its presence erodes health and productivity, leading to reduced incomes and poverty.

The complex issue of food security was emphasised by Chris Manyamba, a PhD student from the University of Pretoria's (UPs) Institute for Food, Nutrition, and Well-being (IFNuW) during his presentation to the delegates on the *Situation of Food Security in COMESA* at the Fifth Meeting of the Common Market for Eastern and Southern Africa (COMESA) in Addis Ababa.

The Fifth Meeting of the Ministers of Agriculture, Environment and Natural Resources was attended by Ministers of Agriculture from COMESA member states, the Technical Group, as well as partners which included, among others, the UNFAO, Alliance for Commodity Trade in Eastern and Southern Africa, University of Pretoria, as well as the Southern African Confederation of Agricultural Unions.

His presentation informed the Ministers that available data and information sources indicate that hunger is still a threat in most COMESA member states. The data indicates current



Wezi Gondwe and Chris Manyamba at the COMESA meeting

shortages in cereal production in 10 member countries, high food prices, high levels of malnourishment (over 40% of the countries), and low calorie intake (below the recommended daily intake of 2 100 calories). However, there are serious gaps in national data at, because countries are using different indicators, making comparison difficult.

NAThouse lend helping hand to child care centre



Volunteers helping to upgrade the facilities at KCC

Everybody participated in the annual Mandela Day celebrations and spent 67 minutes of their time. Members of NAThouse, the student house in the Faculty of Natural and Agricultural Sciences did the same and became involved in the Kgomotso Children Centre (KCC) in Soshongu.

The NAThouse students managed to obtain a sponsorship from the Dean's Office to buy building materials, including poles, timbers and other building

materials to extend the kitchen and bathroom facilities at KCC. The students also managed to receive money from Project Pools to buy paint and brushes to paint the interior and exterior of the day care facilities. The students then visited KCC early August to assist with the painting and plastering of the walls and spent some time with the children.

Mandela Day did not end here! Lorinda Marais, also from NAThouse also secured a plumber who is willing to donate all the supplies needed for the building of the additional bathroom facilities.



The NAThouse volunteers painting KCC with the help of the children