

# SQUARED<sup>2</sup> UP

Newsletter of the Faculty of Natural and Agricultural Sciences ■ Issue 1 ■ May 2012



## Plant Sciences Complex officially opened

17 January 2012 was a very big day for the Faculty of Natural and Agricultural Sciences. The Vice-Chancellor and Principal at the University of Pretoria officially opened the Plant Sciences Complex which houses diverse departments and institutes in the plant science field. The opening of the complex coincided with a launch of the SAFCOL Forestry Chair by the organisation's acting Chief Executive, Ms Maureen Manyama-Matome.

The new R100 million complex will enhance inter- and cross-disciplinary research collaboration, bringing together departments and faculties that would traditionally not have interacted with one another in traditional paradigms. The new facility includes, amongst others, research laboratories that are dedicated to conducting work in fields such as plant diversity, ecology, biotechnology and medicinal plant science.

One wing of the Complex houses the new Forestry Research programme including the SAFCOL Forestry Chair, as well as a suite of laboratories to accommodate the growing activities of the Forestry and Agricultural Biotechnology Institute (FABI).

The new complex has several postgraduate laboratories and two large undergraduate laboratories, a microscopy laboratory that seats 150 students and a biotechnology laboratory for 120 students. There is a double tier auditorium and two smaller meeting rooms. The building houses a herbarium on the ground level, while the roof area will be used to cultivate plants for experimental purposes in a specially designed glass-covered 'greenhouse'.

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## Message from the Dean

# Creating opportunities through multidisciplinary research

According to the essential science indicators of the Institute for Scientific Information (ISI), the University of Pretoria is currently ranked amongst the top 120 institutions in the world regarding the total volume of research output and the total number of citations in plant and animal sciences and also holds the number one position on the African continent. It is through initiatives such as the new R120 million Plant Sciences Complex and the SAFCOL Chair in Forestry that the Faculty of Natural and Agricultural Sciences wants to significantly increase its research outputs in the near future as well as its international profile by drawing together strong multidisciplinary research teams within this new complex. Read more about the official opening of the Plant Sciences Complex and the launch of the SAFCOL Chair on page 1.

Apart from establishing the Faculty as one of the top international faculties of science, we strive to be the leading science faculty on the African continent contributing significantly through our postgraduate research to some of the major challenges the continent faces in relation to poverty and food, energy and water security, climate change and its impact on agriculture, animal and human health as well as economic sustainability. Although the Faculty already contributes substantially to some of these challenges, the newly established Institution for Food, Nutrition and Well-being (IFNuW), which will focus on even more of these critical areas, and the Faculty will join hands with other faculties to significantly improve its impact and footprint within Africa (read more on page 13-14 about the appointment of the Theme Leaders of the IFNuW).

Being people-centred, the Faculty continuously seeks for opportunities to recruit and appoint highly recognised researchers and academics. One of these new appointments is that of Prof Rivka Kfir as an extraordinary Professor at the UP Water Institute, (read more on page 15). Four departments in the Faculty also appointed new Heads (read more on page 9-12).

As always we are very proud of the outstanding achievements of our staff and students in the Faculty. Prof Mike Wingfield, Director of the Forestry and Agricultural Biotechnology Institute (FABI) has been selected to receive an honorary degree from the University of British Columbia (page 5). The Suid-Afrikaanse Akademie vir Wetenskap en Kuns bestowed the Havenga Prize for Biological Sciences on Prof Nigel Bennett (page 5) and the Agri-Laboratory Association of Southern Africa (AgrILASA) acknowledged the accurate laboratory analyses done by UP Nutrilab with a prestigious award (page 6). Chris Oosthuizen, a recent MSc graduate from the Department Zoology and Entomology was awarded for excellence in science communication by winning the "Science in Action" category of the prestigious annual South African Agency for Science and Technology Advancement (SAASTA) SA science lens photographic competition (page 25). More information about the Faculty's top achievers can be found on page 26.

Research is part of our core business and the importance thereof is emphasised by the ground-breaking research performed by our staff and students. Read more about Prof Bob Millar's research on the neuroendocrinology of reproduction that was published in the prestigious *New England Journal of Medicine* (page 15). Also find out the reason why elephant seals may have to dive deeper to find enough food if current ocean warming trends continue on page 16.

There are so many outstanding achievements by our staff, students and affiliates of which we are very proud. With this newsletter we aim to showcase some of it. We wish you all well for the rest of the first semester and trust that you will enjoy this update on the latest developments in our Faculty.

Prof Anton Ströh  
 Dean: Faculty of Natural and  
 Agricultural Sciences



From the left: Prof Marion Meyer (HOD Department of Plant Science), Prof Cheryl de la Rey (UP's Vice-Chancellor and Principal), Ms Maureen Manyama-Matome (SAFCOL Acting CEO) and Prof Anton Ströh (Dean of the Faculty of Natural and Agricultural Sciences).



The Head of UP's Department of Plant Science, Prof Marion Meyer addressing the attendees during the official opening of the new Plant Sciences Complex with an artist's impression of the building.



From the left: UP's Director of SAFCOL Forestry Chair, Prof Paxie Chirwa; Ms Maureen Manyama-Matome, Acting CEO of SAFCOL and UP's Vice-Chancellor and Principal, Prof Cheryl de la Rey.

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According to Prof Marion Meyer, the Head of Department of Plant Science, the new complex will form a hub of activity in his Department and for the first time in many decades, staff members of the Department have been brought together under one roof. "The new Plant Sciences Complex will enhance collaboration between different departments and institutes which specialise in fundamental research and applied sciences within the Department of Plant Science," said Prof Meyer.

In her address Prof Cheryl de la Rey, the Vice-Chancellor and Principal, said that the new complex is a means to enable the University of Pretoria to achieve its objectives of quality and increased research output, and also a realisation of a vision and commitment which she made at a sod turning ceremony two years ago. The commitment was that for the University to improve its academic quality and output, it has to ensure an enabling environment where the staff and students can focus their passion for and commitment to intellectual and scientific enquiry. Such an enabling environment includes appropriate physical infrastructure.

While the focus was on the celebration of the new facilities, Prof De la Rey also confirmed that the Department of Plant Science at the University of Pretoria is ranked amongst the top institutions in the world, according to the ISI Essential Science Indicators.

The Dean of the Faculty of Natural and Agricultural Sciences, Prof Anton Ströh, emphasised that the Department has accelerated its outputs both within the local and the international sphere which resulted in the University

of Pretoria being ranked number 54 in terms of the volume of outputs pertaining to the plant sciences worldwide. He also said the new complex will enable the Department to deliver and significantly accelerate production in the field of plant sciences.

In launching the South African Forestry Company (Ltd) (SAFCOL) Chair at the University of Pretoria, the acting Chief Executive of SAFCOL, Ms Maureen Manyama-Matome, said her organisation endeavours to promote learning and skills development programmes in forestry programmes. This was realised in 2006 together with the University of Pretoria when a need to extend formal education to prospective postgraduate students from South Africa and the SADC region was identified.

She said: "The University of Pretoria was and still is perfectly positioned to successfully contribute to the need for formal education for prospective students focusing on forestry related research."

Ms Manyama-Matome projected that the establishment of the Plant Sciences Complex will go a long way in supporting forestry research. She also said the SAFCOL Chair launched at the University of Pretoria will become the solution to skills challenges in the thriving forestry industry.

"The success of the SAFCOL Chair in offering quality education and training will depend on the participation of the forestry industry, both within the public and the private sector, and key stakeholders also need to be involved," said Manyama-Matome.



Front: Prof Robin Crewe (UP Vice-Principal), Prof Santosh Warriar and Prof Wiseman Nkuhlu (UP Chancellor). Back: Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences), Prof Andrzej Kijko (Director: Aon-Benfield Natural Hazards Centre, Africa at UP), Mr Philani Mavimbela (UP Department of Geology), Prof Pat Eriksson (Head of UP Department of Geology) and Prof Hariharan Rajesh (University of Johannesburg and also a former student of Prof Santosh Warriar).

## Leading Geologist receives Honorary Doctorate

The University of Pretoria awarded an honorary doctoral degree to Prof Santosh M Warriar, much better known to the global geological community as Prof M Santosh and one of the world's leading geological scientists, at the autumn graduation ceremonies on 13 April 2012. He is from the Kochi University in Japan.

The award of the DSc (honoris causa) is based on a leading international role in thinking and research activities on the global supercontinent cycle, on having established an obscure journal (*Gondwana Research*) and led it as editor to the very pinnacle of current international geological publications and on his personal research publication record and its citation profile.

He has taken the journal *Gondwana Research* from humble beginnings as a newsletter to one of the pre-eminent geological publications today, where it is published by Elsevier Science, the world's leading science publisher, and it is currently in the #1 place amongst the general geological (non-review type) journals in citation rankings, with a 2010 impact factor of 5.503. Prof Santosh has edited this journal throughout its remarkable growth and has turned it into a global geological powerhouse that bestrides the junction of established western geoscience and underlines the rapidly emerging importance of eastern (Japanese, Chinese and Indian) geoscientific thinking. His long academic association with Japanese earth sciences, allied to an earlier educational foundation from India, has given him a unique strength in achieving this and in dominating global thinking and scientific activities related to the supercontinent cycle. His seminal 2004 co-authored book *Continents and Supercontinents* encapsulated ground-breaking work from over two decades.

He was born in India in 1957 and obtained his PhD in 1986 from Cochin University. From 1981 to 2000 he was a Research Fellow and subsequently a Scientist at the Centre for Earth Science Studies, India, with extensive postdoctoral periods in the UK (1988) and especially in Japan (1999 to 2000). It was in the latter country, from the University of Osaka City, that he obtained the DSc in 1990. Since 2000, he has been a distinguished Professor at Kochi University in Japan. He has been the leader of several important bilateral research projects between India and Japan, has co-led a UNESCO project, served on the board of five international journals of high standing, and been a visiting professor at nine international universities in India, France, USA, Japan, Australia, China and South Korea. He supervised eight PhD students as well as many MSc students at a number of universities. He has a publication record in high class international journals and book series which would be very difficult to match for any person from any background: well over 300 scholarly works, an ISI (Web of Science) h-index of 33 (255 documents found; 3 562 citations), with a Scopus record of H=29 (268 documents found). There are 48 book or memoir contributions to add to the list of journal papers. Prof Santosh has also earned many awards, most significantly, the very top geoscientific awards in India: the National Mineral Award and the Outstanding Geologist Award; the former is awarded annually by the Vice-President of the country.

## Plant Science expert wins ESASTAP prize

Prof Dave Berger from the Department of Plant Science and the Forestry and Agricultural Biotechnology Institute (FABI) in the Faculty of Natural and Agricultural Sciences, won the ESASTAP (European-South African Science and Technology Advancement Programme of the Department of Science and Technology) second prize in the category "Capacity Development". He won the award for his contribution as scientific coordinator of the EU INCO-DEV project SAFEMAIZE, which was focused on food security. The first prize was won by Prof Minnaar from the Department of Food Science (featured in the previous newsletter).

Farmers in Africa face the challenge of their maize crop being infected with a cob rot fungus that produces mycotoxins, which has serious health implications for the consumer. The project aimed to develop strategies to reduce this risk. The project also built capacity in crop biotechnology and enhanced co-operation between the three South African partners, the University of Pretoria, the Agricultural Research Council and the CSIR, through collaboration with the University of Rome and the Istituto Sperimentale per la Cerealicolturain, Italy. Plant pathology capacity in Zambia was enhanced through collaboration between the University of Zambia, the University of Pretoria and Plant Research International in the Netherlands.



Prof Dave Berger

## Nigel Bennett receives prestigious award

The Suid-Afrikaanse Akademie vir Wetenskap en Kuns recently bestowed the Havenga Prize for Biological Sciences on Prof Nigel Bennett from the Faculty of Natural and Agricultural Sciences. Prof Bennett is an international expert in ecology, animal physiology and animal behaviour and received the Havenga Prize for Biological Sciences for his research on living material, excluding humans, eg in Agriculture, Biology and Veterinary Science.

The Havenga Prize is awarded each year for original research in the natural sciences and/or the field of technology. The prerequisites in the evaluation of candidates are firstly, research publications and secondly, proof of the promotion of Afrikaans.

Prof Bennett completed his PhD at the University of Cape Town and currently holds the Austin Roberts Chair of African Mammalogy and the SARChI Chair of Mammal Behavioural Ecology and Physiology in the Faculty of Natural and Agricultural Sciences at UP. He is a Full Professor



Prof Nigel Bennett

in the Department of Zoology and Entomology.

His research is focused on ecology, animal physiology and animal behaviour. He studies the biology of African mole-rats and uses

these organisms as model animals for his interdisciplinary studies. He has published one book, contributed 10 chapters in books and published 194 research articles in international peer-reviewed journals, including papers in *Nature*, *Proceedings of the Royal Society of London*, *Advances in the Study of Behavior and Trends in Ecology and Evolution*. He is a fellow of the Zoological Society of London and the Royal Society of South Africa. He has served as President and Vice-President of the Zoological Society of Southern Africa and is editor-in-chief of the *Journal of Zoology*, London and editor of *Proceedings of the Royal Society, London (Biological Sciences) – Series B*.

He received the Chancellor's Medal for Research in 2003 and 2011 and the Zoological Society gold medal in 2008. He has an A-rating from the National Research Foundation (NRF).

Prof Nigel Bennett was also recently a Visiting Professor in the Department of Zoology at the King Saud University in Riyadh, Saudi Arabia.

## Honorary doctorate for forestry expert

Prof Mike Wingfield, Director of the Forestry and Agricultural Biotechnology Institute (FABI) and an internationally renowned researcher, has been selected to receive an honorary degree from the University of British Columbia. The degree will officially be awarded at the University's graduation ceremony in November.

Amongst his most important contributions to forestry has been the role that he played as an advisor to more than 50 PhD students, many of whom now hold very senior positions globally. He was responsible for establishing the Tree Protection Co-operative Programme (TPCP) in 1990 to minimise the impact of pests and pathogens threatening commercial forestry in South Africa and this has become the largest single tree health project in the world. It also formed the catalyst for the establishment in 1998 of the Forestry and Agricultural Biotechnology Institute (FABI; [www.fabinet.up.ac.za](http://www.fabinet.up.ac.za)) of which he was the founding director.

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

He has conducted research on tree pests and pathogens, especially concerning their global movement, for more than thirty years. His highly cited research in this field, conducted in many different countries of the world, has led to the discovery of some of the most important pathogens of trees grown commercially in plantations. It has also elucidated elements of the biology and global movement of many of the most important pests and pathogens of trees, substantially contributing to new management options and solutions to problems, thereby reducing losses to industry. Based on his research reputation, he has been a long term advisor of many major forestry corporations globally.



Prof Mike Wingfield



The team from UP Nutrilab: Front: Elise Ferreira, Truida Smit and Karin Basson. Back: Tebogo Mogotsi, Ilze Smith and Rosa Qoko. Absent: Gerda Kotzé and Moses Phetla.

The Agri-Laboratory Association of Southern Africa (AgriLASA) recently acknowledged the accurate laboratory analysis done by UP Nutrilab with a prestigious award.

The UP Nutrilab, based in the Department of Animal and Wildlife Sciences in the Faculty of Natural and Agricultural Sciences is an analytical laboratory specialising in animal nutrition. In 2002, the nutritional laboratories of the Department of Animal and Wildlife Sciences at UP and the Ethology Department at Onderstepoort merged to form UP Nutrilab. The facility is located in the Agricultural Sciences building and includes research facilities on the experimental farm of the University in South Street, where studies on animal nutrition are conducted.

UP Nutrilab staff members not only accommodate postgraduate and postdoctoral students from the Department of Animal and Wildlife Sciences, they also assist students from other departments with laboratory analyses for postgraduate studies such as Plant Production and Soil Science, Zoology

and Consumer Science. They also assist lecturers from other departments with research.

UP Nutrilab renders a service to the community and other universities by doing analyses for external clients, supported by the expertise of the animal scientists in the Department. It also serves as a reference laboratory for analyses on feeds for registration purposes at the Registrar of Animal Feeds and does wet chemistry analyses for feed companies to calibrate their NIR equipment.

AgriLASA is a non-profitable association for laboratories with agricultural relevance. It aims to promote the use of standard analytical methods, supply quality assurance for laboratories that participate in the association's proficiency scheme, provide proof of competency and reliable results to users of member laboratories and provide a forum for member laboratories to share technical knowledge and experience and to address common challenges.

## SAMS honours Prof Jean Lubuma

A researcher of international calibre at the University of Pretoria was recently awarded with the South African Mathematical Society (SAMS) Award for Research Distinction 2011.

Prof Jean Lubuma is the Head of the Department of Mathematics and Applied Mathematics in the Faculty of Natural and Agricultural Sciences. He received this prestigious award at the joint international congress of the American and South African Mathematical Societies in Port Elizabeth from 29 November to 3 December 2011.

SAMS describes this Award as follows: "This Award serves to recognise and stimulate excellence in research. It is only made in recognition of important research contributions to Mathematics or to the applications of Mathematics in any field. The intention of the Society is that this Award should recognise and reward substantial research carried out in South Africa, which does credit to South African Mathematics. The Award is presented in the form of a silver Möbius band with golden rim and appropriate inscription."

Prof Lubuma enjoys considerable international recognition for his significant contribution to the understanding of domain-singularities of boundary-value problems as well as to the design of innovative and reliable finite/boundary element methods for such problems.



Prof Jean Lubuma receiving the Award.

His current research focus area includes the mathematical epidemiology of infectious diseases of humans: modelling, simulation and applications. Over the past years he has established a good research team and network of

collaborators. He is involved in several projects that have led to quality publications in terms of the relevance and depth of the problems and results.

Prof Lubuma's work is published in excellent journals such as *Proceedings of the Royal Society of London A* and *SIAM Journal on Numerical Analysis* (that are among the top journals in the field) as well as *Mathematische Nachrichten*, *Comptes Rendus de l'Academie des Sciences de Paris*, *Numerical Methods for Partial Differential Equations*, *Journal of Computational and Applied Mathematics*, *Mathematical Methods in the Applied Sciences*, etc. He is also very successful in publishing conference papers in prestigious series such as Pitman Research Notes in Mathematics, American Institute of Physics Conference Proceedings and Marcel-Dekker Lecture Notes in Pure and Applied Mathematics. Prof Lubuma is a Fellow of several academies including the African Academy of Science and the Academy of Science of South Africa.

# Teaching Excellence Award for Charles Maepa

Dr Charles Maepa received the Department of Mathematics and Applied Mathematics Excellence in Teaching Award for 2011. The award gives recognition to Dr Maepa for his dedication to teaching and his professionalism in running a course for a large group of students. The winner of this prestigious award was announced at the annual departmental Bosberaad in November 2011.



From the left: Prof Izak Broere (Chair of the Adjudication Panel), Prof Jean Lubuma (Head of the Department of Mathematics and Applied Mathematics), Dr Charles Maepa, Prof Nthabiseng Ogude (Vice-Principal) and Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences).



Dr Charles Maepa receives the award from Prof Nthabiseng Ogude (UP Vice-Principal).

## WTAMU awards Prof Webb

Prof Eddie Webb, Head of the Department of Animal and Wildlife Sciences in the Faculty of Natural and Agricultural Sciences of the University of Pretoria (UP) recently received an award from the West Texas A&M University (WTAMU). Prof Ted Montgomery from WTAMU handed the award to Prof Webb to celebrate the good cooperation and excellent relations between the two institutions. The award is a statue of a bison, which nowadays is an endangered species. Prof Montgomery is also involved in some research projects between UP and WTAMU.



From the left: Mrs Montgomery, Prof Montgomery and Prof Webb.



Prof Rashid Hassan

## University of Pretoria represented on renowned panel of experts

The University of Pretoria (UP) represented Africa, South Africa and the African continent on the Committee on World Food Security (CFS).

Rashid Hassan, a Professor in the Department of Agricultural Economics, Extension and Rural Development in the Faculty of Natural and Agricultural Sciences, has been appointed as a Project Team member of Climate Change and Food Security. He serves on the High Level Panel of Experts (HLPE) on Food Security and Nutrition as one of the six team members. The other members of HLPE are Gerald Nelson (USA), Zucong Cai (China), Charles Godfray (UK), Maureen Santos (Brazil) and Hema Swaminathan (India).

The HLPE for Food Security and Nutrition is an essential element of the reform of Committee on World Food Security (CFS), an international and intergovernmental platform for food security and nutrition. The HLPE team is tasked to assess and analyse the current state of food security and nutrition and its underlying causes, provide scientific and knowledge-based analysis and advice on specific policy-relevant issues, identify emerging issues and help members prioritise future actions.

Prof Hassan recently received the UP Chancellor's Medal for Research. He has served as a member of many advisory boards and committees, including the Consultative Group on International Agricultural Research Independent Science and Partnership Council, the South African Human Sciences Research Council, the External Academic Advisory Panel for the World Development Report 2009 on climate change and many more. He also led the Africa-wide project on the impact of climate change on agriculture, water and ecosystems. Prof Hassan is a member of the Academy of Science of South Africa and has been elected Senior Fellow of the African Association of Agricultural Economists and Fellow of the Academy of Sciences for the Developing World.



Prof Jolanda Roux and Mr Ball meets Her Royal Highness, Queen Elizabeth II.

## UP researcher meets the Queen of England

There are not many people who can say that they have had the privilege of meeting Queen Elizabeth of England in person. There are even fewer who can say that they were able to visit Buckingham Palace to do so and to spend ten minutes in private conversation with Her Royal Highness. But this was exactly what Prof Jolanda Roux of the University of Pretoria's Forestry and Agricultural Biotechnology Institute (FABI) did in December 2011.

On 13 December 2011 Prof Roux and Mr Jim Ball, Chairperson of the Commonwealth Forestry Association (CFA), reported at the right hand gate of Buckingham Palace (at 12 noon), in response to an invitation by Her Majesty Queen Elizabeth II. The honour emerged from the fact that Jolanda received the "Queen's Award for Forestry" from the CFA. Queen Elizabeth is the patron of the CFA and in 1987 approved the "Queen's Award for Forestry". This award aims to recognise outstanding international contributions to forestry and the achievements of outstanding mid-career foresters, based on a combination of exceptional contributions to forestry and an innovative approach to his or her work. Since its inception, the award has been made only nine times and Prof Roux is the first woman to receive this honour.

She describes the meeting with the Queen as "an incredible experience that in hindsight feels slightly unreal. It is not something that I ever imagined would happen to me and I was completely bowled over, firstly by receipt of this prestigious award, and then when I received a phone call to let me know that Queen Elizabeth had invited me to the palace for an audience with her!"

Prof Roux is a forest pathologist and mycologist and one of the team of academics that lead FABI ([www.fabinet.up.ac.za](http://www.fabinet.up.ac.za)). She also has an appointment in the Department of Microbiology and Plant Pathology at the University of Pretoria. Her research focuses on tree diseases and she is particularly passionate about tree health in general and fungi that cause diseases of trees on the African continent. She collaborates with researchers on many other parts of the world and has travelled widely to undertake her research. She has already published close to 100 papers in international respected journals and has supervised numerous postgraduate students at the University of Pretoria. In addition to the Queen's Award, Prof Roux has received many other forms of recognition for her work, notably the DST's "Distinguished Young Women in Science" award which she received in 2011.



# Award winning female scientist leads Biochemistry



Prof Debra Meyer

Few people know that the new Head of the Department of Biochemistry, Prof Debra Meyer, has also been a freelance weather presenter on SABC 2 for more than a decade. Prof Meyer has been appointed as the Head of the Department of Biochemistry in the Faculty of Natural and Agricultural Sciences from 1 January 2012. Prof Meyer took over the reins from Prof Jan Verschoor.

She completed her master's degree through the former Rand Afrikaans University and her PhD in Biochemistry and Molecular Biology through the University of California, Davis (UCD).

Prof Meyer has been the recipient of several awards and accolades including the NSTF/NRF TW Kambule distinguished black researcher award in 2004 and again in 2010. Prof Meyer also received the Academy of Science for the Developing World's TWAS promising young scientist award in 2005. In 2007 *Rapport* and *City Press* recognised her as one of ten SA "Women of Prestige". She was also a visiting scientist at Harvard University's Viral Immunology Department in 2004 and at the University of California, San Francisco in 2010. She has been an NRF-rated scientist since 2004.

Her research involves pioneering the use of modern analytical chemistry tools in the study of HIV/AIDS leading to first time publications on biofluid-metabonomics for use in HIV/AIDS research and demonstrating the effect of metal-organic compounds on HIV infection.

Prof Meyer says the possibility of contributing to the future of the Biochemistry Department is an exciting leadership opportunity. She adds: "The staff members of the Department have been doing reputable work in research and teaching thus far which provides a solid platform from which to move forward. Research relevant to the country is already being done in the Department and is in line with the University's themes and objectives. Visionary leadership, effective strategies and innovative management can add value to and expand upon the Department's present reputation. My role as the Head of the Department will be to provide such strategic and inventive leadership, to inspire stakeholders to pursue and support the new vision and to convert strategic ideas into practice."

She envisages that the Department will be recognised as one of the premier science departments of the University, the region and the country on the basis of high quality internationally recognised research and a rigorous and relevant teaching curriculum. Academic staff members will publish regularly in peer reviewed international journals and/or register viable patents and make an impact on undergraduate biochemical science education. The postgraduate projects and research plans of the Department will attract dedicated, inquisitive students who choose this department because of its reputation for excellence and ability to deliver critical thinkers and productive young scientists in a timely manner.

Prof Jan Verschoor was the Head of the Department Biochemistry from 2003 until 2011.

He was responsible for focusing the research of the Department to the diagnosis, prevention and cure of human and animal infectious diseases, in particular aiming at the big three poverty related infectious diseases of Africa, namely AIDS, TB and Malaria. Prof Meyer's appointment as HIV specialist researcher of renown provided a climax to that ideal. Prof Verschoor's Tuberculosis Research team have invented five international patents on innovative TB diagnostics and therapy since 1995. They entered into a research agreement with Bangor University (UK) and the CSIR (Pretoria) in 2005, aimed at developing these products for market. After competing in the National Innovation Competitions of 2004 and 2008, they achieved finalist status in the 2009 NSTF Award Competition. Prof Verschoor now focuses on pioneering the University's first commercial roll-out venture in new, innovative TB diagnostics relevant to AIDS-burdened countries, of which South Africa currently counts among the worst affected in the world. He is also a consultant to the CSIR's innovation of nano-encapsulated anti-TB drugs, which is supported by the DST for commercial roll-out. He is currently rated by the NRF as a C2 researcher.



Prof Jan Verschoor

# Chris Theron leads Physics department

From theology to physics... Prof Chris Theron, newly appointed Head of the Department of Physics in the Faculty of Natural and Agricultural Sciences, kicked off his academic career studying BA Theology but after three years changed to Physics, focusing on the use of ion beams to characterise solids and thin film reactions in particular. He follows in the footsteps of Prof Johan Malherbe who retired from this position at the end of 2011.

Prof Theron developed the first in situ real-time Rutherford Backscattering spectrometry (RBS) facility and was invited to give a lecture on this development at the Ion Beam Analysis conference in Dresden (1999). He worked at iThemba LABS (a National Facility of the NRF making use of accelerator based science) for sixteen years and was head of the Materials Research Group for the last six years. In 2007 he accepted a position as principal research scientist at the Diamond Research Laboratory of Element Six, with the task of searching for new applications of diamonds or the application of high-temperature high-pressure technology to novel materials. "In 2010 I was appointed as professor in the Physics Department where I am making use of the 2 MV Van de Graaff accelerator for studies of materials. My current research interests are in ternary thin film reactions, materials for safe use in nuclear and



Prof Chris Theron at one of the experimental stations of the 2 million volt Van de Graaff particle accelerator on the Hatfield Campus.

nano-crystalline diamond films," Prof Theron says.

He is a member of the South African Institute of Physics and was a director of the not-for-profit Cape Initiative for Materials in Manufacturing. He also chairs the Programme Management Committee of iThemba LABS (Gauteng) and the Users Advisory Committee of iThemba LABS (Faure). Prof Theron was instrumental in setting up a collaboration agreement with the Centre for Energy Research and Development in Nigeria, resulting in their successful acquisition and commissioning of the pelletron accelerator.

Prof Theron explains, "I consider my most important work, besides my publications on real-time RBS, a range of papers on predicting phase formation sequence in thin film systems, of which one has been cited more than a 100 times." He plans to improve the facilities available in the Department, both for teaching and research. He adds: "The Physics Department is keen to rise to the 2025 challenge, and it is my role to coordinate the great ideas that keep bubbling up from the members and make sure we act deliberately to achieve our goals."

Prof Malherbe was the Head of the Department of Physics from 1998 to 2011 and Chairperson of the School of Physical Sciences from 2000 to 2008 in the Faculty.

Although he did his PhD on theoretical physics, he changed his research field to experimental physics and modelling of surfaces. He completed sabbaticals at various research institutes and universities in Germany and Denmark, where he conducted research with the leaders in surface physics, Siegfried Hofmann and Peter Sigmund. He has published on virtually every aspect of ion bombardment effects on solids and is especially known for models and experiments to explain preferential sputtering and its phenomena, as well as for models and experiments in topography development on semiconductor materials. He has been invited to present plenary lectures at international conferences and to write review papers on various aspects of ion-solid interactions. Recently, he started working on material problems connected to the nuclear power industry.

He has served on a large number of national and international committees and on several of those as chairperson. He has also received national and international awards. He is currently a board member of the National Science and Technology Forum, South African Council for Professional Scientists and the International Advisory Board of Atomic Collisions in Solids. He has received the UP Exceptional Academic Achiever four times. He has a B2-rating from the NRF.



Prof Johan Malherbe

# Elna Buys new HOD of Food Science

An expert in food microbiology and food safety was recently appointed as the new Head of the Department of Food Science in the Faculty of Natural and Agricultural Sciences. Prof Elna Buys is a C2-rated scientist with the National Research Foundation and was appointed from 1 February 2012. She succeeds Prof Amanda Minnaar.

Prof Buys completed her PhD in Microbiology through the University of the Witwatersrand and started her career at the University of Pretoria at the end of 2001. Prior to this, she was a Senior Researcher at the Agricultural Research Council (ARC).

She is appointed to the technical committee of the South African Dairy Standards Agency (appointments by invitation only). She is currently supervising and co-supervising four master's students, two PhD students, one postdoctoral and one DTech degree student. Prof Buys has published more than 40 journal articles and 4 books.

Prof Buys emphasises that the Department of Food Science has shown excellent growth in teaching, learning and research, "but despite our success we need to set new goals because the areas of food science and nutrition are constantly offering new opportunities which we have to be a part of. It is essential that we are constantly adapting and proposing new initiatives."

Her vision for the Department, among other goals, is that it will be the academic leader in its respective research areas, including the dissemination of food science and nutrition knowledge to educate students, promote optimal health and well-being and food security and to serve the needs of South Africans and beyond. She adds: "We should also form strategic alliances to advance food security and promote health and well-being and contribute to community development in areas where we can make a difference to improve food safety and quality of food produced by the South African industry, government policies and food security and well-being of consumers."

Prof Amanda Minnaar was the Head of the Department of Food Science from 2001 until 2011. She completed her PhD through the University of

Pretoria and recently received acknowledgement for 25 years in service of the University.

Her field of expertise includes food processing and preservation, sensory evaluation, legume science and technology. Amongst others, she is a professional member of the South African Association for Food Science and

Technology (SAAFoST), chairperson of SAAFoST Northern Branch Committee and a member of the Institute of Food Technology, USA.

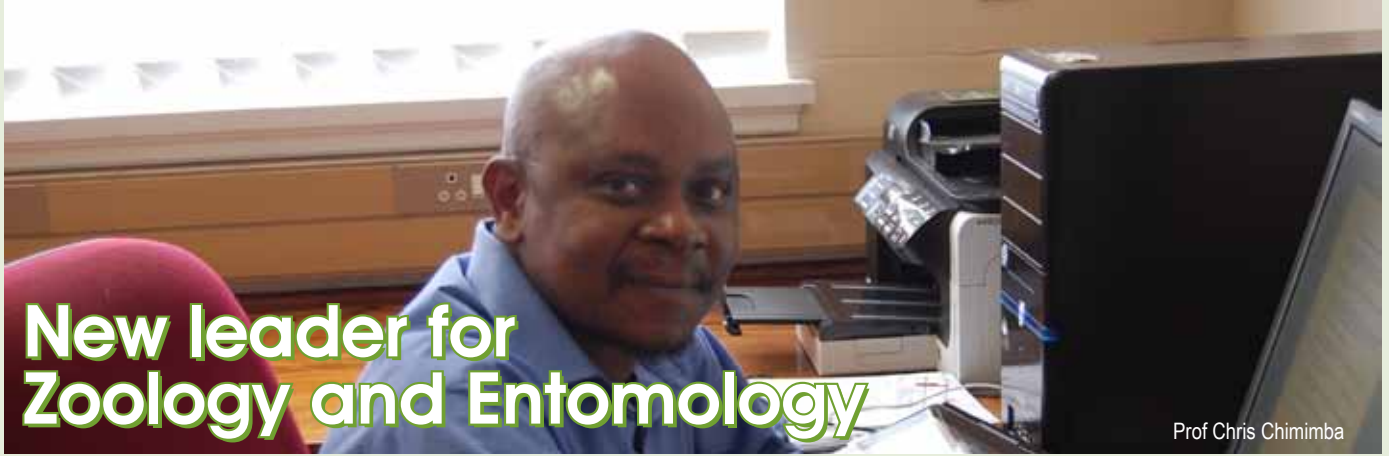
Some of the highlights in her career have been her participation as project leader or chief scientific investigator in several international projects. This includes the USAID-funded Bean/Cowpea Coordinated Research Programme, the FAO/International Atomic Energy Agency International Working Groups and the EUINCO-DEV Marama II Project. She also recently won the first prize at the European-South African Science and Technology Advancement Programme (ESASTAP) awards. Prof Minnaar won the first prize in the Category of Capacity Development in 2011, as a result of the EU Marama II project she was involved in. She is also a C2-rated scientist with the National Research Foundation.



Prof Elna Buys



Prof Amanda Minnaar



# New leader for Zoology and Entomology

Prof Chris Chimimba

Prof Chris Chimimba, a renowned zoologist and a Scientific Fellow of the Zoological Society of London, has been appointed as the new Head of the Department of Zoology and Entomology in the Faculty of Natural and Agricultural Sciences. Prof Chimimba follows in the footsteps of Prof Sue Nicolson.

Prof Chimimba, a Professor in Zoology and a Fellow of the Linnean Society of London (FLS) (London), is registered as a Professional Natural Scientist (Pr. Sci. Nat.) and has a C2 NRF Scientific Rating. He completed his PhD through the University of Pretoria.

He is currently a Professor in the Department of Zoology and Entomology and a Research Associate of the world renowned Mammal Research Institute (MRI). He is a core team member of one of the six prestigious DST-NRF Centres of Excellence in South Africa, the Centre of Excellence for Invasion Biology (CIB). His research is mainly in biosystematics of African fauna ranging from vertebrates to invertebrates where he applies morphometric, DNA sequencing, cytogenetic, ecological, epidemiological, and GIS techniques, and focuses on taxa of medical, veterinary, agricultural, economic and nature conservation importance.

Prof Chimimba has acted as a scientific reviewer for as many as 25 internationally accredited scientific journals, is a Consulting Editor for *Navorsing van Nasionale Museum*, Bloemfontein and was an Associate Editor of the highly regarded *Journal of Mammalogy* (USA) and the journal *Biodiversity & Conservation* (The Netherlands). He serves as a member of the advisory boards of the Transvaal Museum and the Centre of Excellence at the Percy FitzPatrick Institute at the University of Cape Town, a trustee of the Green Trust (Nedbank) and the Institute for the Breeding of Rare and Endangered Mammals South Africa (IBREAM SA). He has acted as a consultant in major projects such as the *Red Data Book on South African Mammals*. He has also endeavoured to popularise his research through popular articles and the electronic media such as the SABC's 50/50 nature programme.

Prof Chimimba's vision for the Department is to maintain the status quo of

one of the most productive academic departments in the University and the country and to take it to yet another level. He plans to continue with the Department's strong research programmes and to attract funding as well as an excellent cohort of undergraduate and postgraduate students and postdoctoral fellows. He emphasises that this will not only focus on the needs of the scientific community but also aim to address government needs that go beyond science. Prof Chimimba furthermore plans to identify and encourage linkages with other potential partners within and outside the university, as well as other relevant across-discipline expertise.

Prof Sue Nicolson was the Head of the Department of Zoology and Entomology from 2003 to 2011. She completed her BSc honours degree at the University of Auckland in New Zealand and received a Commonwealth Scholarship to do her PhD in insect physiology at Cambridge University. After coming to South Africa she worked in the Zoology Department at the University of Cape Town. She moved to UP in 2001.

Prof Nicolson's main research interest is in physiological aspects of pollination biology, specifically nectar and pollen as food for bees and birds. She regards the recent research grant from the UK Insect Pollinators Initiative to work on nutritional regulation in bees, funded by the Biotechnology and Biological Sciences Research Council (BBSRC) and others, as a highlight of her career.

She received three awards in 2010. Prof Nicolson received the gold medal of the Zoological Society of Southern Africa, was the first runner-up for the Distinguished Woman Scientist in Life Sciences Award of the Department of Science and Technology and was elected as Fellow of the Royal Society of South Africa. In 2009 she shared the Bill Venter/Altron Book Award with co-author Steven Chown of Stellenbosch University, for *Insect physiological ecology: Mechanisms and patterns* (Chown & Nicolson, 2004).

Prof Nicolson has published more than 130 journal articles and two books, is rated as a B2-rated researcher by the NRF, and has an h-index of 23 on the ISI Web of Science.



Prof Sue Nicolson

# IRT Theme Leaders for Food, Nutrition and Well-being appointed

Following the establishment of the Institute for Food, Nutrition and Well-being (IFNuW) to facilitate and host the Institutional Research Theme (IRT) on the same topic and the appointment of Prof Sheryl Hendriks as Institute Director, lead researchers have now been appointed to lead the focus areas of the IRT.

The team of internationally recognised researchers was selected through a competitive process. Each brings strategic leadership to the five focal areas of the IRT and will invest their energy in establishing a critical mass of people

Leaders and the Principal Investigators of the initial eight strategic projects funded through the IRT to identify core institutional values that will characterise the Institute's interactions, research and products. The Institute seeks to fashion a new model for collaborative research and therefore identified the core values to characterise the 'business unusual' approach to organisation of our activities.

The five IRT Theme Leaders will facilitate and build strong teams of researchers in each of the five thematic areas, create platforms for

essentially bridges the traditional divide between Animal and Veterinary Science. His research projects have led to the development of practical management techniques and include studies on Heartwater, the use of lactoperoxidase in goat milk and the effects on cheese and goat milk quality, goat kid rearing techniques and Leucaena as an alternative fodder resource for milk goats. As Vice-President of the International Goat Association, he has contacts in many other countries with people whose vocation is to help promote goat research and development with the aim to alleviate poverty, promote prosperity and



Prof Sheryl Hendriks



Prof Ned Donkin



Prof Lisa Korsten

and projects to develop the strategic trans-disciplinary areas of research.

The Institute is essentially a virtual platform that facilitates and hosts the IRT for Food, Nutrition and Well-being (FNUW). Staff associated with the Institute will include all who participate in the IRT for FNUW projects, externally funded projects that are signed under the auspices of the Institute and members of Institute Think Tanks. In return, the Institute Associates will acknowledge this association in all products and outputs of such collaborations and activities.

The Institute recently held a workshop for Theme

collaboration and integration of expertise and provide an enabling research environment for innovation and a significant increase in postgraduate output and research publications.

Some background on the five Theme leaders:

**Prof Ned Donkin** was appointed as Interim Theme Leader for development of research that explores how to increase sustainable agricultural production in a resource-constrained environment. His academic training in Animal Science and extensive teaching and research experience in Veterinary Science makes him well placed to facilitate activities in this theme that

improve the quality of life.

He hopes to encourage colleagues to partner this exciting new venture and develop a wider vision across disciplines to answer some of the urgent questions relating to the need for more food and better quality food production, especially in Africa.

**Prof Lise Korsten** is a Plant Pathologist / Microbiologist who specialises in postharvest technology, fresh produce food safety and biocontrol. Her research team has developed rapid diagnostic methods for detection of the most important *Penicillium* spp in the litchi, citrus and stone fruit export chains. This technology is

also used in forensic phytopathology to address and solve global fruit trade disputes. Prof Korsten believes that fresh fruit losses incurred during production, packaging and at the market result in huge economic losses to farmers, impact government revenue negatively and add to the erosion of consumer confidence. In order to reduce food waste, it is essential to first develop a strategic approach to rapidly identify the pathogen, determine the point of contamination, establish the reason for spoilage and develop a more effective food management system. More recently, Prof Korsten has also included a project focusing on the link between contaminated irrigation water and food safety.

Her vision for the theme Food Safety, Biosecurity, Public Health and Regulatory Control is to bring together existing expertise in plant-, animal- and human health under a unifying focus on "One Health". This will provide a unique opportunity for researchers from different fields of study to integrate complementary research activities and strategically position the University as one of the leading institutions in Africa focusing on challenges related to food safety, biosecurity, public health and regulatory control.

**Prof John Taylor** was born and educated in England. After working at the CSIR for 12 years, mainly researching sorghum in brewing, he joined UP's Food Science Department in 1992 as a cereal scientist and food chemist. He is an internationally respected specialist on the science and processing technologies of the indigenous African cereals sorghum and millet. His vision for the Functional Biomolecules and Health-promoting Foods Theme is encompassed in three interrelated core elements: Science, Projects and People Development, in which he had practical experience. Prof Taylor explains: "The science,

for example, is about researching and developing natural bioactive compounds and foodstuffs to prevent and treat malnutrition and lifestyle diseases and conditions." The focus of his theme will be on indigenous African crops and foods made from them as the source materials, as they are uniquely rich in bioactive phytochemicals.



Prof John Taylor

Prof Taylor sees his appointment as a personal ambition to devote the remaining six years of his formal career as an opportunity to help scientists, the food industry and people in sub-Saharan Africa develop the skills and know-how "...so that everyone will have enough to eat and be more healthy and productive, so that we can end the scourge of poverty."

**Prof Ronél Ferreira** is leading a novel focus on behavioural change for improved health and well-being. She was appointed to UP in 2010 and is the Head of the Department for Educational Psychology in the Faculty of Education. Her current research focus areas are psychosocial support within the context of vulnerability, psychological well-being of children and communities, HIV/AIDS, asset-based psychosocial coping and the use of action research in combination with intervention-based

studies that could improve community-based coping and facilitate community development and well-being.

Prof Ferreira will draw on the expertise of researchers across disciplines to identify strategies to change perceptions, attitudes and behaviour with regard to food choice,

food production and consumption to address hunger and improve food and nutrition security, health, consumer well-being, emotional functioning and adaptation as well as environmental sustainability. She asserts that by focusing on social and cultural aspects of food production and consumption, societal attitudes and structures relating to food security may be addressed, as well as cultural forces impacting on food production and consumption.

She is excited to lead a team of scientists from various disciplines to conduct research that

could facilitate behaviour change, which in turn may result in social and community development. She says: "By working as a team and drawing on the expertise of colleagues, we can support efforts to enhance health and well-being in the various spheres of life." In conducting joint research, research capacity building can take place, facilitating personal and professional development.

**Prof Sheryl Hendriks**, a lead specialist on African Food Security and Director of the IFNuW will act as interim leader for the theme on Food Policy and Impact Assessment. Under this theme a Think Tank will be established to explore food security indicators for impact assessment of the ideas and recommendations emanating from projects in the other four themes and to inform national debate on this topic.

# World-renowned water specialist appointed to develop Water Institute

Prof Rivka Kfir, former CEO of the Water Research Commission, recently joined the Water Institute of the University of Pretoria (UP). The UP Water Institute is currently addressing a wide range of water issues through its participating members from all UP faculties. Prof Kfir will play an important role in the positioning of the UP Water Institute in the national and international academic, governance and stakeholder environments.

The UP Water Institute is a unique academic institute that is addressing a wide range of water issues, including water and agriculture, water and health, water and global change, water treatment and infrastructure and water governance. It emphasises working across academic disciplines and faculties and follows a strong trans-disciplinary approach to solving water challenges.

Prof Kfir has a PhD from the University of Pretoria and MSc (cum laude) in Management from London Business School, Department of Economics,

University of London. Her association with the South African and the global water sector began 32 years ago when she joined the CSIR as a doctoral student.



Prof Rivka Kfir

From 1986, Prof Kfir acted as a Group Leader of the Microbiology Group and thereafter as the Programme Manager of a programme addressing water and health, both at the CSIR. She addressed a wide range of land and water uses (from domestic to agricultural use) and in addition to

conventional water microbiology and chemistry, her research group focused on toxicology and bio-toxicology.

She was Director of the Division of Water Technology at the CSIR and later served as the CSIR's Technology Manager. In 2000, she moved from the CSIR to the National Research Foundation (NRF) as the Executive Director: Knowledge Management, after which she was appointed as the CEO of the Water Research Commission.

Prof Kfir authored and co-authored approximately 80 refereed publications and more than 200 business reports and co-supervised a number of PhD and MSc students. She has served on many national research steering committees, presented a number of papers and keynote addresses and was an invited speaker at numerous local and international conferences.

She also served on a number of international committees and boards and has chaired global initiatives such as Streams of Knowledge, a coalition of resource centres addressing water and sanitation. She has been actively involved in NEPAD's initiative aiming at building centres of excellence for water research in Africa and has represented South Africa's academia at many gatherings addressing water research.



Prof Robert (Bob) Millar

## Prof Millar published in prestigious journal

Prof Robert (Bob) Millar, Director of the Mammal Research Institute in the Department of Zoology and Entomology has not only published over 350 papers which have received over 10 000 citations but he also recently published two articles in the prestigious *New England Journal of Medicine* which is ranked highest amongst all scientific journals, having an impact factor of 47. He recently received an A-rating from the National Research Foundation.

His research focuses on the neuroendocrinology of reproduction. This addresses the mechanisms by which diverse internal factors (eg. sex hormones, stress hormones, infection, glucose, lipids and other metabolites) and external factors (eg. day length, temperature, stress, chemicals and foods) signal to the brain which then integrates this information to regulate reproduction. For example, nutritional deprivation as in anorexia nervosa and the loss of menstrual cycles due to weight loss in long distance runners result from a reduction in the brain hormone gonadotropin-releasing-hormone (GnRH). 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.

Although it was clear the GnRH was a master brain hormone controlling reproduction we had no idea how the diverse factors mentioned above regulated the GnRH neuron as it lacked receptors for the regulators. This conundrum was recently solved by the discovery that mutations in genes encoding two brain hormones and their receptors led to a failure in humans to progress through puberty. The hormones, Kisspeptin and Neurokinin B are now a major focus of research directed at developing new drugs for treating diseases of human reproductive tissues. He contributed to these advances in many publications including two recently published in the prestigious *New England Journal of Medicine*. These articles described mutations in the human GnRH gene and Kisspeptin gene which result in a failure to advance through puberty.

Prof Millar is now using this clinical knowledge to understand how environmental stresses such as food deprivation, infection (eg. TB) and high temperatures resulting from climate change impinge on the neuroendocrine system to affect reproduction in wildlife, and how responses to Kisspeptin and Neurokinin B are a sensitive index of stress and disease.

# Elephant seals may be forced to dive deeper in a warming ocean



Dr McIntyre and an elephant seal bull on Marion Island. (Phathu Radzilani)

Submitted by Dr Trevor McIntyre

Elephant seals may have to dive deeper to find enough food if current ocean warming trends continue. According to Dr Trevor McIntyre, postdoctoral researcher at the Mammal Research Institute (MRI) in the Department of Zoology and Entomology, it was recently reported in the journal *Marine Ecology Progress Series* that the southern elephant seals (*Mirounga leonina*) from Marion Island are seemingly diving deeper and spending less time at targeted depths, when diving in warmer waters.

This we ascribe to potential prey species occurring at deeper depths where their specific thermal preferences are met. The results in this manuscript form part of some of the outcomes from an intensive satellite-tagging programme jointly undertaken by Prof Marthán Bester's research group at the MRI (UP Department of Zoology and Entomology) and colleagues from the Alfred Wegener Institute for Polar and Marine Research in Germany, as well as the University of Cape Town. For this we deployed more than 70 satellite-relay data loggers on elephant seals hauled out at Marion Island – these tags are glued to the heads of immobilised seals\* and provide information on the positions and dive characteristics of seals, as well as environmental variables such as water temperature and conductivity via the Argos satellite system. These findings have now made some international headlines

(eg. <http://www.sciencedaily.com/releases/2012/02/120209140200.htm>

<http://www.livescience.com/18442-elephant-seals-dive-deeper-global-warming.html>

<http://news.discovery.com/earth/elephant-seals-go-deep-120212.html>)

The results of this investigation suggest that the elephant seals of Marion Island will be forced to undertake more extreme dives and thereby incur greater physiological costs should ocean warming continue. Southern elephant seals regularly exceed their so-called "calculated aerobic dive limits", diving continuously for prolonged time periods (dives lasting on average anywhere between 20 and 30 minutes and separated by times at the sea surface of no longer than 2.5 minutes on average). We suggested previously (McIntyre et al. 2010) that the Marion Island elephant seals are possibly

already operating closer to their physiological limit, since seals from this population seem to be generally diving deeper and for longer time periods in comparison with other populations. Coupled with shorter life spans recorded for seals from this population, we suggested there may be some physiological costs involved in what we described as a "deeper diving – shorter life" hypothesis. This is something we now plan on investigating in some detail given the continued tracking of elephant seals at sea and an existing long-term mark-resighting programme on Marion Island. This long-term dataset places us in a unique situation whereby we can now start linking at-sea behaviour (through continued satellite-tracking) with lifetime consequences in terms of survival and reproductive success.

\*Tags are glued to the fur on the heads of seals. Once a year, all elephant seals return to the island to moult – replacing all their hair and the outer layer of skin. During this process the satellite tags fall off and can mostly be retrieved by researchers.



Female southern elephant seal with deployed satellite-relay data logger. (Trevor McIntyre)



## Eucalyptus tree genome yields secrets to woody biomass production

Prof Zander Myburg from the Department of Genetics and the Forestry and Agricultural Biotechnology Institute (FABI) in the Faculty of Natural and Agricultural Sciences, presented the results of the Eucalyptus Genome Project at the recent International Plant and Animal Genome Conference in San Diego, California in January 2012.

Prof Myburg is the principal investigator (PI) of the US-Department of Energy (US-DOE) funded project to decipher the genome of *Eucalyptus grandis*, a fast-growing forest tree

considered to be a potential bioenergy crop. Prof Myburg visited the DOE - Joint Genome Institute (JGI) in Walnut Creek, California, where he worked with co-PI Dr Jerry Tuskan of Oak Ridge National Laboratory on the draft genome paper. Genome analyses performed by Prof Myburg's research team at the University of Pretoria and by international collaborators are uncovering the tremendous genomic diversity of eucalypts, which underlies their wide adaptability and the expansion of gene families involved in woody biomass production.



Prof Zander Myburg (UP Department of Genetics) and Dr Jerry Tuskan (Oak Ridge National Laboratory (ORNL) at the Joint Genome Institute in Walnut Creek, California).



Prof Elna Buys (second from right, front row) with students and staff of the Department of Preventative Medicine, University of Valencia.

## Research on apple juice in Spain

Prof Elna Buys, Head of the Department of Food Science, recently spent five months in Spain where she did research in the Faculty of Pharmacy at the University of Valencia. She received a fellowship and worked closely with Dr Jordi Mañes i Vinuesa, Head of the Department of Preventative Medicine and Dr Houda Berrada (both are specialists on mycotoxins). The focus of her research was microbiological risk characterisation of apple juice concentrates. As both Spain, in particular Valencia, and South Africa have vested interest in exporting fruit, this project was of interest to both countries. During her time in Spain she also visited Prof Mieke Uyttendaele at the University of Ghent and presented a lecture on Water Quality and its Impact on Food Safety at their International Training Programme on Food Safety.

## Biomath Forum launched

Mathematicians and biologists came together at the end of 2011 to launch an interdisciplinary initiative called the Biomath Forum in the Faculty of Natural and Agricultural Sciences. The Biomath Forum is an initiative for interdisciplinary research unifying mathematical modelling, qualitative analysis and experimental investigation in biosciences with the ultimate aim of elucidating the underlying biological processes. In short, the Biomath Forum will stimulate research into issues of interest both to mathematicians and biologists.

The first lecture was delivered by Prof Roumen Anguelov on the *Mathematical Modelling of Sterile Insect Technology for Control of Anopheles Mosquito*. In her welcoming address, Prof Brenda Wingfield, Deputy Dean: Research and Postgraduate Studies in the Faculty, highlighted the importance for researchers from both extreme sides of science, namely mathematicians and biologists, to meet and network regularly.



From the left: Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences), Prof Marion Meyer (Head of Department of Plant Sciences), Prof Brenda Wingfield (Deputy Dean: Research and Postgraduate Studies, Faculty of Natural and Agricultural Sciences), Prof Jean Lubuma (Head of Department of Mathematics and Applied Mathematics) and Prof Roumen Anguelov (Department of Mathematics and Applied Mathematics).



From the left: Dr Andre Eggen, Dr Carina Visser, Prof Eddie Webb (Head of UP Department of Animal and Wildlife Sciences), Prof Este van Marle-Koster and Dr Donagh Berry.

## Genomic workshop on livestock breeding in South Africa

The first workshop on the use of genomics in South African livestock breeding was hosted by the Department of Animal and Wildlife Sciences in the Faculty of Natural and Agricultural Sciences from 15 to 17 February 2012. The aim of this workshop was to enhance the understanding of the application of this new and exciting technology in the livestock industry. The workshop was attended by 45 animal breeders, geneticists and postgraduate students in animal breeding from UP, University of the Free State, University of Stellenbosch, the Agricultural Research Council, GADI, SA Studbook, LRF and Taurus.

The two international speakers, Dr Donagh Berry from Teagasc (Ireland) and Dr Andre Eggen from Illumina (France), presented excellent technical talks. They discussed the principles of genomic selection and presented examples of how genomic selection has been successfully implemented in countries such as Ireland, France and Scandinavia.

The workshop was facilitated by Mr Elfick from Learning Strategies and the participants actively engaged in the discussions on how genomic selection can find application in the South African industry. The challenges and limitations that might be experienced were taken into account and a five step strategy was outlined.

A task team representing the organisations and institutions present agreed on the steps required for genomic selection in South Africa and made recommendations that will now be circulated to the broader livestock breeding industry and the relevant governmental organisations.

It was clear from these deliberations that South African animal breeders are ready to move forward with the research and development of a genomic selection strategy for livestock breeds in South Africa.

## Teaching Geology: a new course for beginners

Geology is a practical science, where students learn to describe, identify and interpret rocks of many different facets and varieties. The rock fragments from collections, examined in practicals, however, do not reflect nature. Field relationships of rocks to each other and to mineral deposits cannot be taught only in a laboratory. Exposure to large scale, 3-D outcrops, in relation to the topography and the dimension of time in Earth History, helps to develop 4-dimensional thinking and to understand the basic concepts in Geology.

Despite exploding numbers of students in Geology and the Engineering programmes, served by our Department, we have felt the need to develop a new course, "Introduction to Geology", based on former GLY 151 and 152 courses, where such exposure is granted.

In the GLY 155 course, run by Prof Wlady Altermann (Kumba-Exxaro Chair in Geodynamics) with Ms Nelda Breedt and Mr Marnus Ferreira (both Afrikaans lecturers), Ms Vusani Mathada (Tutor), and Ms Khensani Mavikane, Mr Zakhele Nkosi and Mr Nkhupetseng Mohlahlana as demonstrators, geoscientific methods and theories can be studied and practiced.



Learning on the rocks of the Strubenkop Hill, high above Pretoria

The course includes an introduction to the solar system, structure of the solid matter, rocks and minerals, the endogenic and exogenic rock cycle and the dynamic Earth of plate tectonics and atmospheric processes. With the support of Mr Roelf Coertze, Manager of the UP's Experimental Farm, first-year students can practice in real outcrops, within walking distance of the Department. We have already practised at the Strubenkop Hill with 475 students divided into five groups! The students enjoyed this so much that they decided to attend additional field hours. The eye-opening effect is tremendous and cannot be valued highly enough. The new course will thus encompass three weeks of such exercises within a 14 week course duration, next to multimedia interaction on clickUP and traditional laboratory work and lectures.

# Mathematical satellite conference at UP



Two of the internationally acclaimed speakers at the Joint AMS-SAMS with Prof Anton Ströh, Dean of the Faculty of Natural and Agricultural Sciences of the University of Pretoria, at the satellite conference. Left is Prof Zhong-Jin Ruan (Department of Mathematics, University of Illinois) and right is Prof László Zsidó (University of Rome).



Delegates at the South African Mathematical Society (SAMS) Satellite Conference at the University of Pretoria.

The Faculty of Natural and Agricultural Sciences presented the joint American Mathematical Society (AMS) and South African Mathematical Society (SAMS) Satellite Conference on Abstract Analysis in December last year. This followed on the successful joint international congress of the American and South African Mathematical Societies in Port Elizabeth from 29 November to 3 December 2011.

The main topics under discussion were *Classical and non-commutative Functional Analysis and Operator Algebras and single linear operator theory*.

# Swedish Ambassador talks on climate change

On 29 March 2012 the Swedish Ambassador, Mrs Anna Lindstedt, delivered a speech at the University of Pretoria. She visited the Department of Geography, Geoinformatics and Meteorology in the Faculty of Natural and Agricultural Sciences. The title of her address, *How to contribute to the fight against Climate Change – the Swedish example*, was very relevant and topical.

A career diplomat since 1990, she currently holds the position of Ambassador for Climate Change and Chief Negotiator for Sweden in the UNFCCC negotiations. Between 2006 and 2011 she was the Ambassador of Sweden to Mexico and from 2003 to 2006 she served as Ambassador of Sweden to Vietnam. Other assignments abroad include Second Secretary at the Embassy of Sweden in Jakarta,



From the left: Prof Anton Ströh (Dean: Faculty of Natural and Agricultural Sciences), Ambassador Anna Lindstedt and Prof Hannes Rautenbach (Head: Department of Geography, Geoinformatics and Meteorology).

Indonesia and First Secretary in Islamabad, Pakistan. Between 2000 and 2003, Anna Lindstedt was Head of the South Asia Section at the Ministry for Foreign Affairs in Stockholm, prior to which she was Desk Officer at the Department for Global Affairs.

Before joining the Swedish Foreign Service, Anna Lindstedt worked as a journalist for five years. She

studied Journalism, Political Science, Economics, International Relations, International Law and Languages at Lund University. She also holds a Diploma of French Language and Literature from the Sorbonne, Paris.

# UP hosts 38th Botanists' conference



Attendees of the 38th Annual Conference of the South African Association of Botanists.

In January this year the Department of Plant Science hosted the 38th Annual Conference of the South African Association of Botanists (SAAB) at the Sanlam Auditorium on the Hatfield Campus. The Conference coincided with the official opening of the newly completed R100 million Plant Science Complex on 17 January.

The theme of the conference was "Plants and Society" and this was reflected by the five keynote speakers representing the breadth of the Plant Sciences. Prof Robert Verpoorte from the University of Leiden in The Netherlands spoke on "Metabolomics: a gateway to discoveries". Prof Joseph Hirschberg from the Hebrew University of Jerusalem, Israel, presented some aspects of his renowned career in cloning the genes for all the steps in the carotenoid biosynthesis pathway. Prof Petr Pysek, a leading conservation biologist from the Czech Republic, spoke on invasion biology with a global perspective.

Two local NRF A-rated scientists presented keynote

lectures: Prof Willian Bond from UCT and Prof Richard Cowling from NMMU. The conference was attended by 260 delegates, half of them postgraduate students. It was attended by members of the Departments of Plant Science, Genetics, Biochemistry, Zoology and Entomology, Plant Production and Soil Science, Microbiology and Plant Pathology and the Forestry and Agricultural Biotechnology Institute (FABI), illustrating that the Faculty is a national hub of interdisciplinary research in the Plant Sciences.

Student prizes were evaluated by independent panels of local and overseas researchers. The prizes for the best Young Scientist and best PhD presentations were won by students from the University of the Witwatersrand and Stellenbosch University. The best MSc student presentation was won by Sarah Stanton from the UP Department of Plant Science. Nanette Coetzer from the Bioinformatics Unit of the UP Department of Biochemistry and Jonathan Botha from the UP Department of Genetics shared the best poster prize for their posters.

# Partnership renewed with schools in Mamelodi and Eersterust



Prof De la Rey (left) converses with Mr Godfrey Seletisha (Department of Education's Tshwane South District, responsible for FET section in Teaching and Learning) with Dr Dan Thokoane in the middle.

Prof Cheryl de la Rey, Vice-Chancellor and Principal of the University of Pretoria recently invited the principals of secondary schools in Eersterust and Mamelodi to a meeting to discuss the partnership between the University and these schools. Prof De la Rey emphasised the importance of the role of the principals and their schools in giving their input to the University's strategy and plans to reshape and grow the Mamelodi Campus for the benefit of everyone.

## Plant Pathology shares Baskets of Knowledge

A group of Plant Pathology scientists and undergraduate students from the Faculty of Natural and Agricultural Sciences recently went on a Southern African Development Community (SADC) tour to share a "Basket full of knowledge" of "Food Security challenges in Africa".

The group paid a visit to commercial farms, informal markets and food enterprises as well as small scale farmers in South Africa, Swaziland and Mozambique. The group visited rural villages and schools to share knowledge on how to reduce postharvest losses, discuss the importance of food safety and hygiene as well as assess sustainable water resource management, crop production and -protection practices and other challenges.

The main purpose of this tour was to share knowledge and experience at different levels and within several themes of the International Society for Plant Pathology's (ISPP) Food Security programme. Two vehicles travelled through SADC with a mobile laboratory that was used to illustrate to farmers, school children and local communities the concept of microbes are everywhere; see them in action. The laboratory was used to demonstrate simple water, plant and food tests that can be used by teachers and farmers to address food security challenges or to share knowledge.

The SADC food security and knowledge sharing project is part of a global initiative of the ISPP to educate young people, rural communities and small scale farmers about food security issues. The ISPP Task Force on Global Food Security has funded this project, i.e. "Changing Public Policy and Opinions on Global Food Security". This tour formed part of the initiative "Taking science to the community" and represents one of the project deliverables.

For more information please contact Prof Lise Korsten on 012 420 4097 or send an email to [lise.korsten@up.ac.za](mailto:lise.korsten@up.ac.za)



Prof Korsten sharing a moment with one of the learners



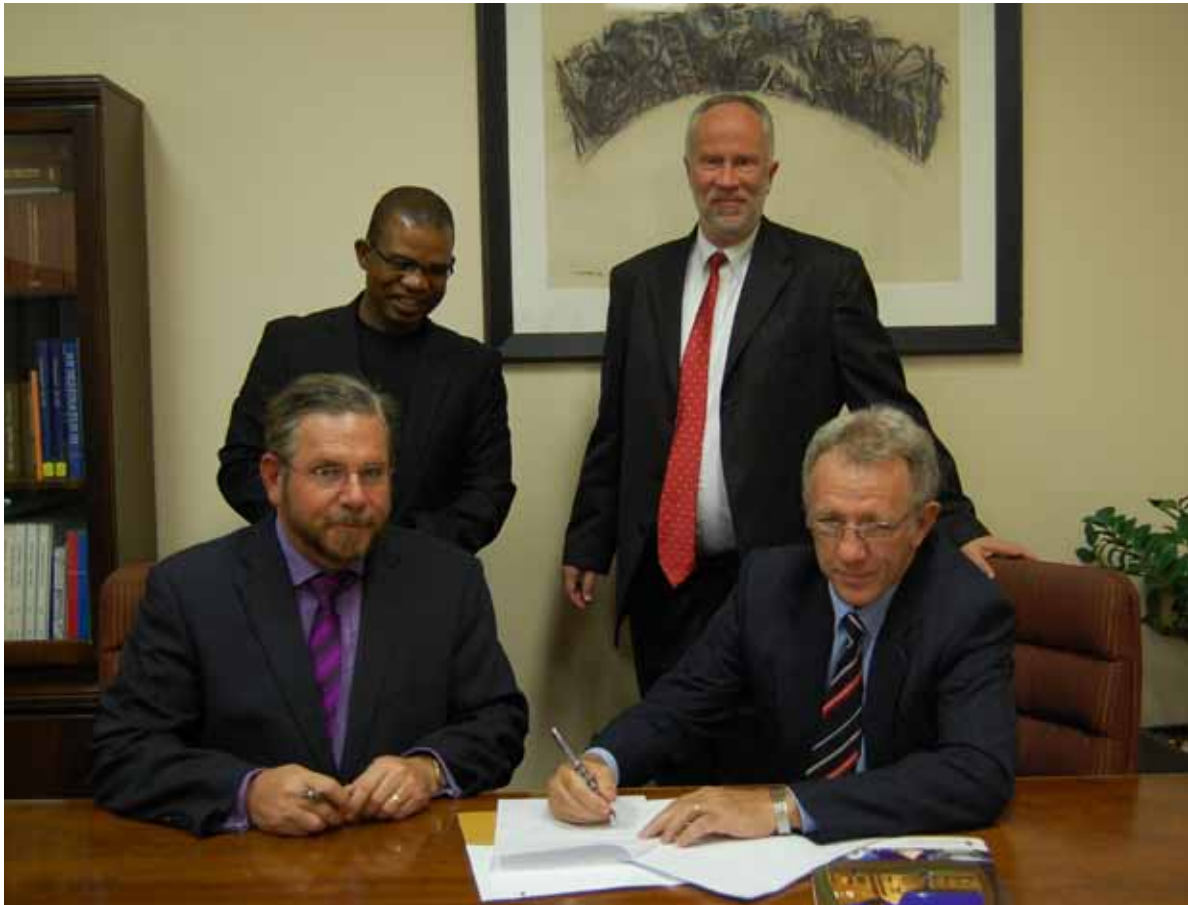
Handing out caps and booklets to the small scale farmers in Swaziland

# US assists in science education in Mamelodi

A Memorandum of Understanding (MoU) between the United States of America Embassy and the University of Pretoria was signed on 5 April 2012. This MoU is a continuation of an established partnership between the two parties for the Mae Jemison US Science Reading Room, an educational programme on the Mamelodi Campus.

The agreement was renewed in March this year and will continue until 2015. The Mae Jemison Room is used to educate learners as well as members of the community (Mamelodi and Eersterust) about science and other related academic projects and to provide the learners and members of the community with educational material.

The Mae Jemison US Science Reading Room was officially opened in 2008 and named after the first African-American woman astronaut, Dr Mae Jemison.



Front: Mr Karl E Stoltz (Minister Counsellor for Public Affairs: US Embassy in SA) and Prof Johann Engelbrecht (Deputy Dean: Teaching, Learning and Community Engagement in the Faculty of Natural and Agricultural Sciences). Back: Mr Edwin Smith (Campus Director: Mamelodi Campus) and Mr Steven P Kerchoff (Information Resource Officer: US Embassy in SA).

# Statistics master's student awarded the S2A3 Bronze Medal

Not only did Theodor Loots receive his MSc in Mathematical Statistics cum laude in 2011, but he was also recently awarded the S2A3 Bronze Medal for the work he did in his master's degree.

Theodor Loots, currently working as credit risk analyst at ABSA was born with about 5% sight but this never kept him from achieving his goals.

The South African Society for the Advancement of Science (S2A3) annually awards a Gold, Silver and Bronze Medal. The Gold Medal award recognises the exceptional contribution to the advancement of science on a broad front or in a specialised field, by an eminent South African scientist. The Silver Medal is awarded to a person under the age of 40 who is actively engaged in research and has, by way of international participation and publications, shown outstanding capability and achievement. It is one of the highest awards granted for original scientific research in South Africa. The Bronze Medal serves to commend and encourage local science students at master's level.

Theodor Loots was awarded the Bronze Medal and a certificate on Tuesday, 14 February 2012.

Theodore said he was inspired by Sir William Rowan Hamilton. "On October 16th, 1843, while walking with his wife past the Broome Bridge (Dublin), Hamilton made a breakthrough in his quest for extending complex numbers with the concept of a system that contained one real and three imaginary parts. Hamilton's excitement at the discovery prompted him to carve the critical equation into a nearby bridge as insurance against the possibility that he might die before he told someone else of his breakthrough. A plaque is now located at Broome Bridge in Dublin to commemorate the event."

These words motivated Theodor to tackle the research. In his dissertation the work of the main contributors to the quaternion distribution theory, utilising the representation theory, was contrasted and presented as a whole; for the first time, the matrix-variate quaternion normal and quaternion Wishart distributions were derived from first principles, i.e. from their real counterparts, exposing the relations between their respective density and characteristic functions; and the role of the quaternion normal distribution in applications was illustrated. In August 2011, Theodor was fortunate enough to complete the circle and to present his work at the International Statistical Meeting in Dublin, Ireland.



Theodor and Prof Andriette Bekker (Theodor's supervisor during his master's degree).



Students



Theodor Loots and his wife Katryn.



## PhD student rubs shoulders with Michelle Obama

Osmond Mlonyeni, a PhD student from the Forestry and Agricultural Biotechnology Institute (FABI) and the Department of Genetics in the Faculty of Natural and Agricultural Sciences (second from left) recently had the

opportunity to rub shoulders with the wife of the President of the United States of America, Mrs Michelle Obama (second from right) at the reception given to her during her first official state visit to South Africa.

Students

## Food Science celebrates *Taste of Africa*



Staff and students from the Department of Food Science dressed in traditional wear.

The Department of Food Science in the Faculty of Natural and Agricultural Sciences hosted a *Taste of Africa* Feast on 23 March 2012. The feast was jointly organised by the Department and TUKSFoST, the student body that represents the undergraduate and postgraduate students of the Department of Food Science. The theme of the feast was *Taste of Africa with Influences from the rest of the world*. Students and staff had the opportunity to share the rich and diverse cultures of the Department by making a traditional dish from their own culture. The festive mood was further enhanced by staff and students wearing traditional outfits to complement the event.





*Aurora australis* is also called the Southern Lights. This spectacular and awe-inspiring phenomenon appears in the Antarctic sky in winter. Aurora is the name given to the light that radiates from atoms and molecules in the atmosphere as they release energy. That energy is passed to them when high energetic particles enter the atmosphere at the Poles, directed by the Earth's magnetic field, and collide with them. When the energy is released again, it is released as light. The colour of the Aurora depends on the elements present in the Earth's upper atmosphere.

Chris Oosthuizen, a recent MSc graduate from the Department Zoology and Entomology in the Faculty of Natural and Agricultural Sciences was awarded for excellence in science communication by winning the "Science in Action" category of the prestigious annual South African Agency for Science and Technology Advancement (SAASTA) SA science lens photographic competition. This photo also won the top place in the Space Science special award. SAASTA is a business unit of the National Research Foundation. Another photo, entitled *Celestial science* was awarded the runner-up place in the SpaceScience special award. SAASTA aims to advance public awareness, appreciation and engagement of science, engineering and technology in South Africa.

The winning photo is entitled *Aurora australis* and is available at: [http://www.saasta.ac.za/index.php?option=com\\_content&view=article&id=268](http://www.saasta.ac.za/index.php?option=com_content&view=article&id=268).

## Chris Oosthuizen wins SAASTA photo competition



*Celestial science*

# First group of Four-year Programme graduates

The first cohort of the BSc Four-year Programme that kicked off in 2008, graduated during the past autumn graduation ceremonies. A total of 53 students successfully completed the programme and was awarded their degrees in April 2012.

The BSc Four-year Programme was first implemented by the Faculty of Natural and Agricultural Sciences in 2008 and has lower entrance requirements. The Programme is designed for students who are not academically

bridge the gap between school and higher education.

The UP Four-year Programmes have two phases. During the first phase, which lasts 18 months (three semesters); students are trained and developed academically and psychologically for further studies. They then continue their studies in the second phase where they join students in the normal three-year mainstream degree programmes.



Faculty overall top achiever, Andrew Graham and Prof Chris Theron (Head: Department of Physics).

## Faculty celebrates academic excellence at Top Achievers function

"We live in an interconnected world with a wealth of opportunities. There is an incredible amount of knowledge to generate and share – and the University of Pretoria (UP) is one of the institutions through which this can be done." These words were shared by Prof Bernard Slippers, guest speaker at the annual Outstanding Achievers Function for Students of the Faculty of Natural and Agricultural Sciences on 12 April 2012. He shared his personal experiences of academic excellence and opportunities at a leading research institution such as UP.

Andrew Graham scooped up the awards at the event and was also awarded the Vice-Chancellor and Principal's Awards as the overall top achiever in the Faculty of Natural and Agricultural Sciences. He received the Department of Physics Prize for the best third-year student in Physics and the Pierre du Plessis Prize for the best third-year student in Physics with distinction. He was also awarded the Dewald Hattingh Book Prize for the best third year student in Mathematics, a prize jointly awarded to him and another student. Andrew received his BSc degree in Physics with a weighted average performance of above 86% over the three years of study.

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



Students

prepared, but who are willing to work hard to succeed and obtain their degree.

As from 2012, the BSc Four-year Programmes were expanded to give students who are interested in a career in Information Technology, Computer Science, Multimedia as well as Commerce, but do not meet the normal admission requirements, an opportunity to further their studies.

The programmes include an additional year of study which enhances students' basic knowledge and skills before progressing onto more specialist studies in the later years of the programmes. Lectures for the first two semesters take place on the Mamelodi Campus where after students continue with their studies on the Hatfield Campus. Students who embark on this programme have much greater opportunity to succeed in their studies, as it provides dedicated support to students who need assistance to

During the first phase the academic content is delivered at a slower pace than the normal programmes so that students have more time to engage with the subject content and develop a thorough understanding of the material. During the three semesters of phase 1 the pace will be increased gradually. By the time students have completed the first phase they should be able to work at the normal speed required of mainstream university students.

The Four-year Programmes focus on understanding and developing critical thinking skills as well as the practical skills needed to continue with the subject.

For further information on the UP Four-year Programmes, contact the Director of the Programme (Dr Quenton Kritzinger) on 012 842 3469 (Mamelodi Campus) or 012 420 2799 (Hatfield Campus) or send him an email to [quenton.kritzinger@up.ac.za](mailto:quenton.kritzinger@up.ac.za)