

# 2014 Faculty of Science Annual Report

The Faculty of Science is respected within South Africa, Africa and the international academic arena as an important knowledge-partner that plays an active role in the development of South African society.

The 2014 annual report provides an overview of the Faculty's activities in the fields of research and innovation, teaching and learning and community outreach, followed by research highlights from each of our eight academic departments. Read about our footprint when it comes to collaborating with institutions in Africa and the rest of the world, international recognition for our top researchers and postgraduate students, as well as the eight research chairs and two Centres of Excellence within the Faculty.

- Biochemistry
- Botany and Zoology
- Chemistry and Polymer Science
- Earth Sciences
- Mathematical Sciences (Mathematics, Applied Mathematics, Computer Science)
- Microbiology
- Physics
- Physiological Sciences

Photo: Justin Alberts



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## WORD FROM THE DEAN

Welcome to our new look annual report for 2014. We hope this interactive format provides an interesting overview of the activities that took place in the Faculty of Science during 2014.

On the following pages Prof. Terry Robinson, Vice-dean: Research, provides an overview of the Faculty's research achievements for 2014, with a special focus on the quality of our research outputs and the fact that our researchers published a record number of articles during 2014.

The success of our students is a major priority for the Faculty. Prof. Ingrid Rewitzky, Vice-dean: Teaching and Learning, presents the many new approaches and initiatives in this very important activity of the Faculty.

The Faculty's societal impact is reflected in the overview of our outreach activities during 2014. This is followed by the departmental reports with detailed information about the departments' research activities and outputs.

As always, we take great pride in the excellence of our staff and students. Prof. Doug Rawlings, former Acting Dean of the Faculty, and Prof. Terry Robinson, Vice-dean: Research, both received Chancellor's Medals in recognition of their continued contributions to excellence in research. Prof. Robinson was also the recipient of the Havenga Prize for Life Sciences from the *Suid-Afrikaanse Akademie vir Wetenskap en Kuns* (South African Academy for Science and Art).

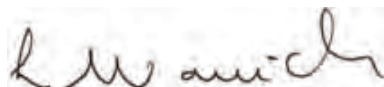
Two staff members, Prof. Dave Richardson and Prof. Guy Midgley, were named by Thomas Reuters as among the most highly cited and influential in their respective fields. Prof. Marina Rautenbach won the Women in Science award, and Prof. Len Barbour received the gold medal for outstanding research from the South African Chemical Institute. Prof. André de Villiers was selected by *The Analytical Scientist* as one of the 'top 40 under 40s' analytical scientists worldwide.

It was certainly an exceptional year for our Computer Science postgraduate students: Mr Rijnard van Tonder was a runner-up in the 'IBM Beat the Mainframe competition' in New York. With Mr Jacques Marais they developed an app which won the student category of the Ericsson Mobile App competition.

Mr Thomas Weighill, a postgraduate student in Mathematics, received the Chancellor's medal from Stellenbosch University for the best final year or postgraduate student at SU in 2014, as well as the  $S_2A_3$  medal for the most outstanding thesis at Masters level.

This is only a glimpse into an annual report packed with information. Enjoy the rest of the report!

Prof. Louise Warnich  
Dean: Faculty of Science



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# RESEARCH AND INNOVATION

PROF TERRY ROBINSON, Vice Dean:  
RESEARCH

The Faculty of Science has a strong research ethos and has been successful in creating highly relevant multidisciplinary research and postgraduate programmes.

Our programmes are supported by two Centres of Excellence and eight research chairs. Nearly 95% of our academic staff hold a PhD and we have partnerships and collaborations with over 700 institutions worldwide.

## Research outputs

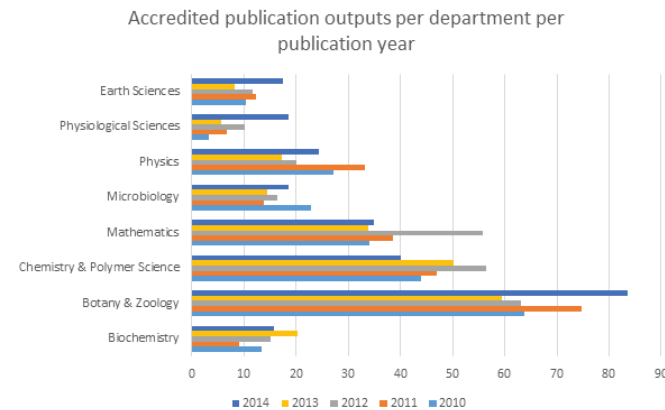
During 2014 researchers, students and other affiliates of the Faculty of Science published a record number of research papers - the accredited publication units for 2014 being 253,35. This is excellent compared with the previous high of 248,81 in 2012. An analysis of the data revealed, among others:

Faculty of Science authors published/co-published most frequently with authors from Germany, the United States, the United Kingdom, Australia, the People's Republic of China and France;

On a national level, the University of Cape Town features as the most frequent collaborating institution, followed by the University of Pretoria and the University of KwaZulu-Natal.



The quality of our publications is a major focus area. A review of publications that appeared in 2013 in the top 20% (or higher) in terms of impact factor within specific subcategories of research as defined in the Web of Science, showed that the Departments of Botany and Zoology and Chemistry and Polymer Science topped the list.



The graph is based on the audited units for the Faculty of Science's research output for publication years 2010-2014, as prescribed by the Policy and Procedures for the Measurement of Research Output of Public Higher Education Institutions (2003) in SA. Only journal articles in accredited journals, peer reviewed books and published conference proceedings are recognised. Source: Division for Research Development (2015) Stellenbosch University

## National and international networks

The Faculty continuously seeks to strengthen and renew strategic alliances with entities such as the Council for Scientific and Industrial Research, iThemba LABS and first-rate international universities and institutions to build capacity and provide development opportunities for postgraduate students.





## Research and innovation

The Faculty places a high premium on creating a culture of innovation among staff and students. During 2014 the departments of Microbiology, Biochemistry, Botany and Zoology, Physiological Sciences and Chemistry and Polymer Science registered nine declarations with Innovus, Stellenbosch University's technology transfer partner. Of these nine, five progressed to provisional patent applications and three to international (PCT) applications.

| Patents                                       | 2011 | 2012 | 2013 | 2014 |
|-----------------------------------------------|------|------|------|------|
| <b>Declarations</b>                           | 14   | 4    | 5    | 9    |
| <b>Provisional patent application</b>         | 9    | 2    | 3    | 5    |
| <b>International patent application (PCT)</b> | 5    | 2    | 2    | 3    |
| <b>Final Patent Application (FP)</b>          | 14   | 5    | 0    | 0    |

## Centres of excellence and research chairs

The Faculty hosts two Centres of Excellence, supported by the Department of Science and Technology and the National Research Foundation. They are the DST/NRF Centre of Excellence for Invasion Biology and the South African Centre for Epidemiological Modelling and Analysis. Seven of our departments host a research chair and/or national centre of excellence (see table on the right).

### Botany & Zoology

- DST/NRF Centre for Invasion Biology (C-I-B)

### Earth Sciences

- SARCHI Chair in Experimental Petrology

### Biochemistry

- SARCHI Chair in Mechanistic Modelling of Health and Epidemiology

### Chemistry & Polymer Science

- SARCHI Chair in Advanced Macromolecular Architectures
- SARCHI Chair in Nano-structured Functional Materials

### Physics

- SARCHI Chair in Photonics-Ultrafast & Ultra-intense Laser Science
- National Institute for Theoretical Physics (NITHeP)

### Microbiology

- SARCHI Chair in Energy Research
- ERWAT Research Chair in Wastewater Management
- Stellenbosch University Water Institute

### Mathematical Sciences

- SARCHI Chair in Mathematical & Theoretical Physical Biosciences
- DST/NRF Centre of Epidemiological Modelling & Analysis (SACEMA)

## Funding

An analysis of the major funding agencies during 2013 showed that the National Research Foundation (38.4%) and statutory councils (51%) are the main funders of research in the Faculty. In order to ensure the ongoing financial viability of the Faculty's research activities, an immediate priority will be to secure funding from non-governmental and international funding institutions. This includes seeking out funding opportunities to ensure that we are equipped with state-of-the-art equipment.

## Did you know?

- Stellenbosch University has the 2<sup>nd</sup> highest number of rated researchers in South Africa
- Of the 342 rated researchers at SU, 106 are in the Faculty of Science
- 95% of our academic staff hold a PhD



## FOCUS ON POSTGRADUATE STUDIES

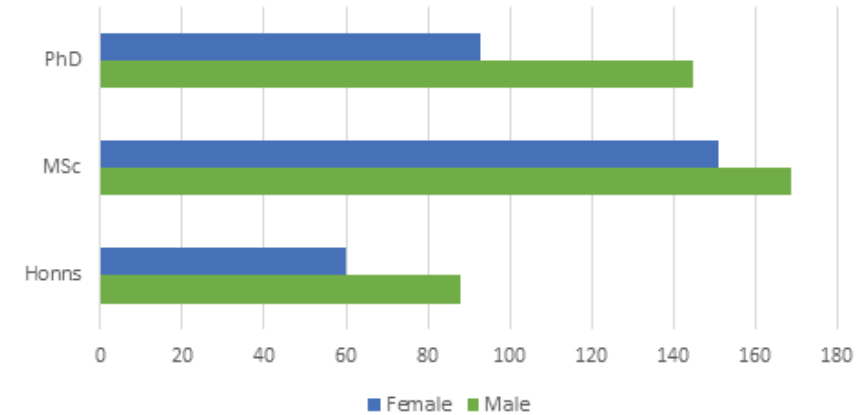
The Faculty offers high-quality training to nearly 700 primarily full-time on-campus postgraduate students. The students are supported by research specialists, extensive infrastructure and state-of-the-art technical facilities.

In 2014, a total of 282 postgraduate students graduated – 128 honours-, 112 MSc- and 42 PhD-students. Nearly 50% of our PhD graduates completed their degree within three years.

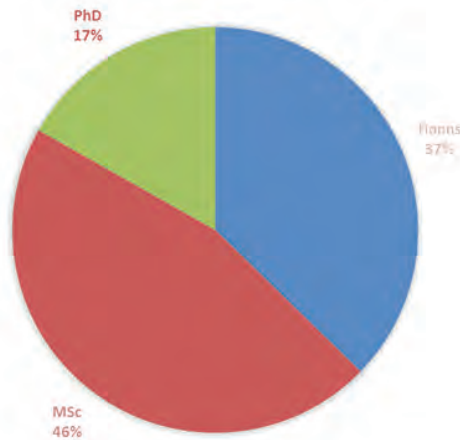
We have been particularly successful in attracting postgraduate students and postdoctoral fellows from other African countries and abroad. The Faculty of Science is currently host to 91 postdoctoral fellows from South Africa (38), Africa (13) and the rest of the world (32).

The total number of postgraduate students has increased by 4% from 618 in 2013 to 678 in 2014. The ratio of white to BCI approximates 60% white to 40% BCI.

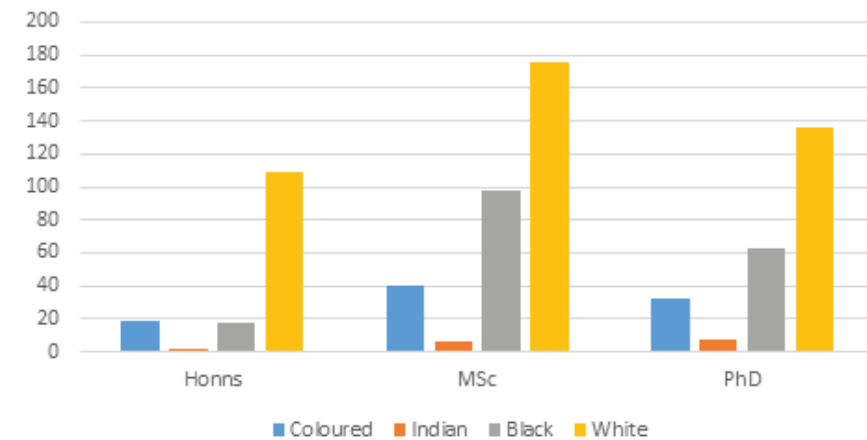
2014 Gender profile of postgraduate students



POSTGRADS GRADUATING IN 2014



2014 Postgraduate students per race



## NATIONAL AND INTERNATIONAL RECOGNITION

SEVERAL OF OUR RESEARCHERS AND POSTGRADUATE STUDENTS WERE RECOGNISED FOR THEIR HIGH-QUALITY RESEARCH IN 2014 AT BOTH NATIONAL AND INTERNATIONAL LEVEL.



**Prof. Dave Richardson**, director of the DST/NRF Centre of Excellence for Invasion Biology (C-IB), and **Prof. Guy Midgley** from the Department of Botany and Zoology were included in the 2014 Thomson Reuters Highly Cited Researchers list of most influential contemporary researchers in their fields of expertise.

[Read more](#)



**Prof. André deVilliers** from the Department of Chemistry and Polymer Science received the 2014 LCGC Emerging Leader in Chromatography Award for pushing the boundaries in the chemical characterisation of complex mixtures.

[Read more](#)



**Prof. Len Barbour**, an experimental chemist, received the esteemed Gold Medal award from the South African Chemical Institute (SACI) in recognition of his outstanding contribution to the field. Prof. Barbour also received a DSc degree for twenty years of research focused on unravelling unusual phenomena in crystals.

[Read more](#)



**Prof. Marina Rautenbach** from the Department of Biochemistry was honoured as an outstanding female scientist in the Natural Sciences and Engineering category of the 2014 South African Woman in Science Awards (WISA).

[Read more](#)



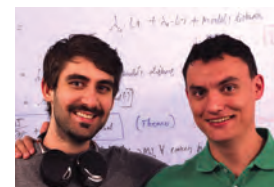
**Prof. Terry Robinson** from the Department of Botany and Zoology was the recipient of the Havenga Prize for Life Sciences from the *Suid-Afrikaanse Akademie vir Wetenskap en Kuns* (South African Academy for Science and Art). Both Prof. Robinson and **Prof. Doug Rawlings** (left) were awarded the Chancellor's award for sustained research excellence at Stellenbosch University.

[Read more](#)



**Dr Sophie von der Heyden** from the Department of Botany and Zoology was elected as a Young Affiliate of The World Academy of Sciences (TWAS). The honour is given to developing-nation researchers who are likely to become future leaders in their research field.

[Read more](#)



MSc Computer Science student **Rijnard van Tonder** (right) was a runner-up in the 'IBM Beat the Mainframe' competition in New York. Together with **Jacques Marais** he also developed an app called WorkMode which won the student category of the Ericsson Mobile App competition.

[Read more](#)



**Thomas Weighill** (right), an MSc Mathematics student, received both the coveted Chancellor's medal and the  $S_2A_3$  medal for the most outstanding research thesis at MSc level in the natural, engineering and medical sciences. Weighill sustained an average of 91.1% during six years of study. His MSc thesis, with a final mark of 97%, was accepted without any revisions by three external international examiners. His study leader was **Prof Zurab Janelidze** (left).

[Read more](#)

# TEACHING AND LEARNING

PROF. INGRID REWITZKY, Vice-dean:  
TEACHING AND LEARNING



The Faculty of Science is committed to the education of young scientists in support of the South African Government's initiative to increase the knowledge base of our community, specifically in the fields of science and technology.

Our programmes are designed not only to prepare graduates for the job market as scientific professionals, but also to equip students with the knowledge and skills required to enter postgraduate study programmes. In this regard we have initiated various strategies and plans to improve student success on undergraduate and postgraduate level, to increase student diversity in terms of race and gender, and to employ the latest information technologies to enhance teaching and learning and student engagement.

Thanks to these initiatives, we have experienced a steady upward trend in student diversity and undergraduate student success and retention over the last decade. However, many transformation challenges still remain.

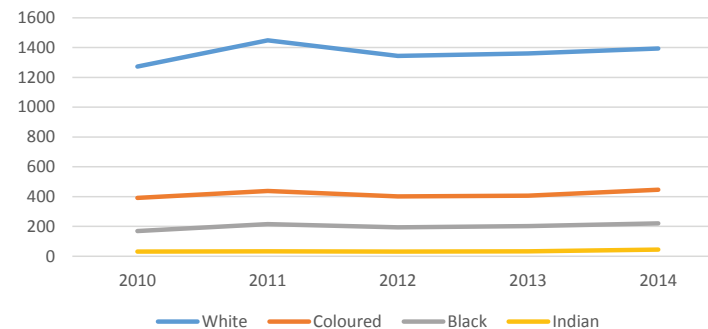
## Student diversity

Looking back at 2014, we enrolled the highest percentage ever (34.8%) of first-time entering Black, Coloured and Indian students. This is the result of an initiative, started in 2013, to improve diversity by increasing the number of recruitment bursaries from 41 in 2012 to 181 in 2014. This resulted in 107 recruited diversity students registering in 2014 (compared to 34 in 2012). In 2015 the Faculty will offer 190 recruitment bursaries.

In order to reach our target of 40% diversity students at undergraduate level by 2019, we are exploiting recruitment opportunities in collaboration with the Centre for Student Recruitment and through activities such as the annual Maties Science Winter Week and other departmental outreach activities. On postgraduate level, the percentage diversity students increased from 35.8% in 2010 to 38.7% in 2014.

On gender level we are also showing progress. The total number of female students, undergraduate and postgraduate, has increased from 49.8% in 2009 to 51.7% in 2014.

Undergraduate students demographic profile  
2010-2014



Since 2010, the Faculty of Science has experienced a steady upward trend in student diversity.

## Student success

An ongoing challenge is ensuring the success of undergraduate students. The average pass rate in the Faculty of Science has improved from 76.6% in 2008 to 82.33% (2013) and 80.67% in 2014. However, we are concerned about the low percentage of students who complete their degree in three years. Significant efforts have been made to improve student success in critical courses, including the appointment of tutors and teaching assistants, and differentiated tutorial support to cater for the varying levels of preparedness of first-year students. The aim is to develop the necessary study and learning skills during the first year to enable students to become independent learners.

Reading skills and comprehension are essential for academic success. In 2013 strategic funding was obtained to investigate the use of a web-based reading programme to improve students' reading, comprehension and writing skills. The reading programme will be implemented in the Scientific Communication Skills course over the next three years, starting in 2015.

The Faculty is working towards implementing the SU's language strategy whereby all our programmes can be taken in English while keeping the percentage of a programme that can be taken in Afrikaans above 60%.



## Teaching and learning

The Faculty's Science Teaching and Learning Discussion Forum meets monthly, with an annual workshop to explore a more student-centred learning approach as well as the incorporation of IT and other social media platforms to enhance teaching, learning and assessment activities. Since 2013 the Faculty has obtained a teaching development grant from the Department of Higher Education for identifying potential future academics from the postgraduate cohort and involving them in assessment methodology, blended learning, the use of ICTs, the re-design of modules and the development of new approaches for improving student engagement. [Read more](#)



Group work during Physics tutorials has suddenly become a lot more fun after physics lecturers Profs Brandon van der Ventel and Richard Newman introduced iPads into the equation. Core Group, authorised distributor of Apple products in South Africa, and DigiCape, a local reseller of Apple products, supported the project by making 17 iPads available for the duration of the project. Photo: Wiida Fourie-Basson

## Teaching excellence

Several of our lecturers were recognised by top-performing first years for their contribution to their academic success in 2013. The lecturers were then invited to attend the Rector's Dinner for Top-Performing Students, hosted by the First-Year Academy of Stellenbosch University.



**Dr Marietjie Lutz** (middle) from the Department of Chemistry and Polymer Science were recognised by two students, Ms Maryke Botha (BAgric) (left) and Ms Jana Botha (BSc).

"For the first time I can recall, chemistry has been presented to me in a way that I could understand." – Maryke Botha

"You have an extraordinarily way of explaining and your ability to summarise the text book in solid comprehensive notes, are, in a nutshell, commendable." – Jana Botha



**Prof. Ed Jacobs** (Department of Chemistry and Polymer Science) with first year engineering student Mr Kwazi Frank Dlamini.

"The humility and the patience you have with a student is all that I needed to be confident in what I do and made me want to do better." – Kwazi F Dlamini

**Dr Maritha le Roux**  
(Department of Chemistry and Polymer Science)

"I believe that the bond between lecturer and student is essential and mutually beneficial...Thanks to your teaching methods, patience, friendliness and approachability, I was able to achieve my objectives and success." – Celeste de Kock

**Dr Karin-Therese Howell**  
(Mathematics Division)

"In our mathematics classes we not only interpreted mathematical limits – you also motivated us to rise above our circumstances and achieve our personal success limit in life." – Aldu Duminy

**Prof. Lynette van Zijl**  
(Computer Sciences Division)

"Your enthusiasm and passion for computer science shown during lectures is contagious and had a big influence on my feelings towards the subject." – Elrich Groenewald

**Prof. Alex Valentine**  
(Department of Botany and Zoology)

"You made me realise that complicated work or terms didn't have to be feared but should rather be seen as an opportunity to challenge yourself and learn something new about the world around us." – Alistair Galloway

**Prof. Florian Breuer**  
(Mathematics Division)

"I think the reason why you stand out above other lecturers is because you very effectively incorporate humour, examples and their relationship with the real world in your lectures." – Chris van der Westhuizen

**Dr Gareth Arnott**  
(Department of Chemistry and Polymer Science)

"In all the lectures presented by Dr Arnott he was always intellectually stimulating and always kept the class involved which I feel is an invaluable quality for a lecturer to have." – Justin Hurst



## COMMUNITY OUTREACH



### Chemistry outreach initiative

The Stellenbosch University Chemistry Outreach Initiative (SUNCOI) hosted two workshops – the “Practical with Purpose” workshop for Grade 10 to 12 learners and “Teaching the teacher the nuts and bolts of chemistry” workshop for Grade 10 teachers. SUNCOI was initiated in 2013 by Dr Rehana Malgas-Enus and Prof. Klaus Koch to enhance the teaching and learning of chemical practicals at historically disadvantaged schools.

[Read more](#)



### Physics annual outreach road trip

Postgraduate students in Theoretical and Nuclear Physics undertook the sixth annual outreach road trip along the Garden Route. The students demonstrated basic principles in physics such as fluorescence and phosphorescence, optical communications and non-Newtonian fluids to nearly 400 children at nine schools. This initiative is sponsored by the Optical Society of America (OSA) Student Chapter. On the photo, from left to right, Ruan Viljoen, Zina Ndlovu, Kevin Li, Erasmus du Toit, Paul Williams, Janusz Meylahn, Vernon Chisapi, Hein Fourie, Catherine Pfukwa, Bart Smit and Rikus Groenewald.



### Teaching biodiversity to teachers and high school learners

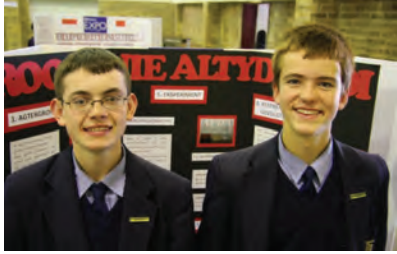
The limbivane project participated in the Western Cape Education Department's Careers Expo at Overberg Primary School in Caledon on 1 August 2014. A competition to identify different ant species under a microscope promoted learner interaction and increased curiosity in insect morphology. limbovane is a long term monitoring project which focuses on ant diversity in different natural and modified landscapes and involves educators and learners from secondary schools. Photo: Dorette du Plessis

[Read more](#)



### Getting ready for the Mathematics Olympiads

Delegations from South Africa, Botswana and Zimbabwe participated in the annual Mathematics Olympiad Camp and Training, hosted by the Mathematics Division in December 2014. It is the first part of the training and selection procedure for South Africa's teams in the Pan-African and International Mathematical Olympiads. Prof. Stephan Wagner and postgraduate student Ms Desislava Nikolov also offered biweekly classes for interested learners in Stellenbosch, while the Mathematics Division offered training sessions for the Boland teams participating in the South African Mathematics Team Competition on 13 September 2014.



## Eskom Expo for Young Scientists

Every year staff and postgraduate students from the Faculty of Science volunteer as judges at the Stellenbosch regionals of the Eskom Expo for Young Scientists. The Centre for Invasion Biology's (C•I•B) book prize for the best junior research project in the environmental sciences at the 2014 Eskom Expo for Young Scientists was awarded to Charl-Henri Schoeman and Henko van Wyk, Grade 9 learners from Curro Private School in Langebaan. Photo: Wiida Fourie-Basson

[Read more](#)



## Maties Science Winter Week

The Maties Science Winter Week provides learners who are interested in a career in the natural sciences the opportunity to find out more about the study programmes offered in the Faculty of Science and the various disciplines and career opportunities available in these fields. Several of the Faculty's researchers participated in the popular "Date with a scientist" event, where learners meet professional scientists from industry and academia.

## Other outreach activities

- The Computer Science Division co-ordinated a one-day Python introduction course for learners from Stellenbosch High School.
- Dr Rehana Malgas-Enus addressed 125 high school learners from 25 previously disadvantaged schools during the Women in Mathematics convention hosted by the Science Learning Centre at the University of the Western Cape.
- Dr Katherine de Villiers and Ms Varia Nikolayenko presented talks on the application of crystallography and synchrotrons in today's science to learners and teachers from the West Coast Education Division during National Science Week.
- Prof. Nox Makunga presented a lecture at the Stellenbosch Forum and a talk on communicating science at Science Fridays @Stellenbosch.
- Prof. Guy Midgley was chair of the session on community interaction during the 2nd Global Change Conference in December, hosted at the Nelson Mandela Metropolitan University. He also gave several media interviews on World Environment Day.
- Mathematics students competed against 200 students from 10 universities in the third South African Tertiary Mathematics Olympiad on 23 August 2014. While the competition was dominated by UCT, SU students Petri-Johan Last (Engineering) came fourth and three Mathematics students were among the top 20.
- The Mathematics Division was closely involved with the International Mathematics Olympiad which, for the first time, took place in South Africa. They are Prof. Florian Breuer (coordinator), Prof. Stephan Wagner (problem selection committee and problem captain) and Prof. Dirk Laurie (head coordinator), as well as several postgraduate students.

# DEPARTMENT OF BOTANY AND ZOOLOGY

THE DEPARTMENT OF BOTANY AND ZOOLOGY IS A LEADER IN THE FIELD OF EVOLUTIONARY BIOLOGY, WITH A SPECIFIC FOCUS ON THE UNIQUE OPPORTUNITIES OFFERED BY AFRICA'S BIODIVERSITY.

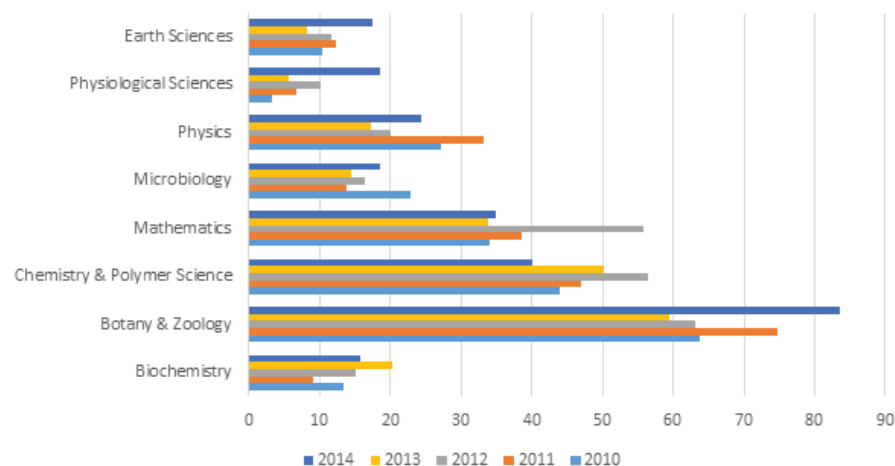
## Research interests

|                                          |                                             |                           |
|------------------------------------------|---------------------------------------------|---------------------------|
| Animal evolutionary ecology & physiology | Evolutionary ecology                        | Animal plant interactions |
| Behavioural ecology                      | Cape Flora                                  | Invasion biology          |
| Ecophysiology                            | Evolutionary genomics                       | Marine research           |
| Nutritional plant physiology             | Vertebrate functional biology & herpetology | Global change ecology     |
|                                          | Medicinal Plant Biotechnology               |                           |

## Research outputs

The Department significantly increased its research output to 176 articles in accredited journals in 2014, compared to 140 articles in 2013 and 133 in 2012. The Faculty of Science's audited research output for publication years 2010-2014 clearly shows that the Department of Botany and Zoology consistently topped the list.

Accredited publication outputs per department per publication year



[Publication list](#)

[NRF-rated researchers](#)

[Staff list](#)

[Contact us](#)

### DEPARTMENTS:

[Botany and Zoology](#)

[Earth Sciences](#)

[Chemistry and Polymer Science](#)

[Biochemistry](#)

[Mathematical Sciences](#)

[Microbiology](#)

[Physics](#)

[Physiological Sciences](#)



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## NRF-rated researchers

More than 70% of our academic staff has been rated by the National Research Foundation – three of them as leading international researchers and five as internationally acclaimed researchers. We have a large group of established researchers and promising young researchers, among them six female researchers. This number includes our research associates, research chairs and retired academics.



## National and international collaboration

Collaborating and participating in national and international scientific programmes are one of the Department's priority objectives. During 2014 we collaborated with over 330 institutions from more than 40 countries – this included co-authorship on journal articles, research projects and student and staff exchange.



The Department worked with 52 different institutions in South Africa. Our most significant international collaborators are institutions in the United States (54) and the United Kingdom (37), followed by France (21), Australia (18) and Germany (15).

## Bilateral funding

Prof. Conrad Matthee received funding as part of the bilateral agreement between South Africa and France for the Biodiversity and Global Change in Southern Africa project (2013-2015). Dr Tammy Robinson obtained funding through the SA-Angola bilateral agreement for the investigation of coastal sedimentation by means of radioisotope mapping (2013-2015).

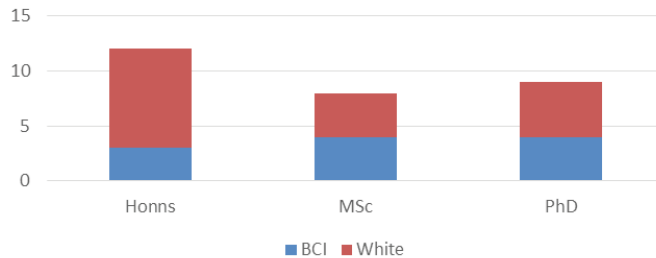


## Focus on postgraduate students

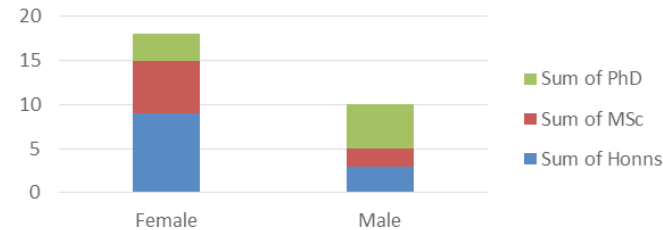
In 2014 we had a cohort of 85 postgraduate students – 18 Hons, 39 MSc and 28 PhD students. By the end of the academic year 12 Honours, eight MSc and eight PhD students graduated. Postgraduate students presented papers and posters at conferences in Uganda, South Africa and Namibia. Three of them walked away with awards:

|                      |                                                                                                                     |
|----------------------|---------------------------------------------------------------------------------------------------------------------|
| Mr Chris Broeckhoven | Best PhD presentation, 12 <sup>th</sup> Conference of the Herpetological Association of Africa                      |
| Dr Romina Henriques  | Best presentation, SU annual postdoctoral research conference                                                       |
| Ms Sara Andreotti    | First prize for the best talk, best written article and best photograph at SU's 'New Voices in Science' competition |

Diversity profile of postgraduate students who graduated in 2014



Gender profile of postgraduate students who graduated in 2014



## Postdoctoral fellows

The Department hosted 16 postdoctoral fellows from South Africa and Africa, Europe and the USA.

## Service to the scientific community

Our staff regularly serve as external examiners or supervisors to students from other universities and on the advisory panels to various conservation and government bodies and on the editorial boards of several prestigious journals.

Several staff acted as moderators, external examiners for courses or as supervisors and co-supervisors for MSc and PhD students at the Universities of Cape Town (UCT), the Western Cape (UWC), KwaZulu-Natal (UKZN), Pretoria (UP), Rhodes (RU), Free State (UFS), North West (NWU), the Cape Peninsula University of Technology (CPUT) and the University of Zimbabwe.

During 2014 the Department's staff were invited by the National Research Foundation (NRF) to act as reviewers or as panel members of special committees: they were Dr Savel Daniels, Dr Jaco le Roux, Prof Anton Pauw, Dr Rambau Victor, Prof Terry Robinson, Dr Tammy Robinson, Dr Simon Carol, Prof Alex Valentine, Prof Hannes van Wyk and Dr Sophie von der Heyden. Prof Leanne Dreyer is a core member of the DST-NRF Centre of Excellence in Tree Health Biotechnology.

## Editorial activities

|                             |                                                                                                                                                                                                                                                |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Michael Cherry        | <i>Emu</i> (associate editor); <i>Folia Zoologica</i> (editorial board member)                                                                                                                                                                 |
| Dr Susanne Clusella-Trullas | Editorial boards of <i>Journal of Thermal Biology</i> , <i>Frontiers in Insect Physiology &amp; Austral Ecology</i>                                                                                                                            |
| Prof. Allan Ellis           | <i>Botanical Journal of the Linnean Society</i> (associate editor)                                                                                                                                                                             |
| Dr Jaco le Roux             | <i>Conservation Genetics &amp; Biological Invasions</i> (associate editor)                                                                                                                                                                     |
| Prof. Guy Midgley           | <i>Diversity and Distributions</i> (editorial board)                                                                                                                                                                                           |
| Prof. Conrad Matthee        | Associate editor of <i>Integrative and Comparative Biology</i> , <i>African Journal of Marine Science</i> , <i>Integrative and Comparative Biology &amp; Molecular Phylogenetics and Evolution</i>                                             |
| Prof. LeFras Mouton         | <i>African Journal of Herpetology</i> (editorial board)                                                                                                                                                                                        |
| Prof. Anton Pauw            | <i>South African Journal of Botany</i> (subject editor)                                                                                                                                                                                        |
| Dr Rambau Victor            | <i>African Zoology</i> (section editor)                                                                                                                                                                                                        |
| Prof. Dave Richardson       | <i>Diversity and Distributions</i> (editor-in-chief); editorial board member of <i>Conservation Biology</i> , <i>AOB Plants</i> , <i>Florist Ecosystems</i> and a book series on biological invasions, published by Cambridge University Press |
| Prof. Terry Robinson        | Editorial board of <i>Chromosome Research &amp; Cytogenetics and Genome Research</i>                                                                                                                                                           |
| Dr Simon Carol              | <i>African Zoology</i> (editor-in-chief)                                                                                                                                                                                                       |
| Prof. Valdon Smith          | <i>Polar Record</i> (editorial advisor)                                                                                                                                                                                                        |
| Prof. Alex Valentine        | <i>Fungal Ecology</i> (subject editor)                                                                                                                                                                                                         |
| Dr Theresa Wossler          | <i>African Zoology</i> (editor); <i>African Entomology</i> (associate editor)                                                                                                                                                                  |

## Conferences and workshops

Staff members delivered oral and poster presentations at international conferences in Germany, the United States, Canada, Japan, Vietnam, Chile, Namibia, China, Saudi Arabia and Oman.

The Department was also well represented at local conferences such as the 15<sup>th</sup> Southern African Marine Sciences Symposium and the annual conference of the Southern African Society of Aquatic Scientists. Staff members participated in two international conferences that took place in South Africa: the XXth conference of the Association pour l'Etude de la Taxonomie de la Flore D'Afrique Tropicale (Aetfat) and the XIVth International Symposium on Biological Control of Weeds.

## Service to the community

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Michael Cherry        | Kalahari Research Trust (trustee) & the Percy Fitzpatrick Institute of African Ornithology (steering committee)                                                                                                                                                                                                                                                                                                                                                    |
| Dr Nox Makunga              | SA Association of Botanists (vice-president) & the SA PhD Project (member)                                                                                                                                                                                                                                                                                                                                                                                         |
| Prof. Guy Midgley           | SA National Global Change Research Committee (chairperson); IUCN Scientific Steering Committee Climate Change Specialist group (board member); ICSU SA National Board (board member); National Global Change NRF/DST Conference (co-organiser); IPCC (coordinating lead author); ASSAF (member); Royal Society of South Africa (Fellow); public presentations for the Department of Environmental Affairs on national long term climate change adaptation strategy |
| Prof. Conrad Matthee        | Endangered Wildlife Trust Riverine Rabbit (steering committee)                                                                                                                                                                                                                                                                                                                                                                                                     |
| Prof. LaFras Mouton         | International Society of Vertebrate Morphologists (member); Zoological Society of Southern Africa (member); Rooi Cederberg Karoo Park (advisory board); Herpetological Association of Africa (chairperson); 12th Herpetological Association of Africa Conference (chair: organising committee)                                                                                                                                                                     |
| Prof. Anton Pauw            | Wildflower Conservation Trust (trustee) & Red Hill Conservation Group (member)                                                                                                                                                                                                                                                                                                                                                                                     |
| Dr Rambau Victor            | Zoological Society of Southern Africa (committee member)                                                                                                                                                                                                                                                                                                                                                                                                           |
| Dr Simon Carol              | 15 <sup>th</sup> South African Marine Science Symposium (organising committee)                                                                                                                                                                                                                                                                                                                                                                                     |
| Prof. Alex Valentine        | JS Marais Park's management committee (advisory board)                                                                                                                                                                                                                                                                                                                                                                                                             |
| Prof. Hannes van Wyk        | Water Research Commission (steering committee); Junior Captain Scott Medal (evaluation panel); 1st African Conference on Health Effects of Endocrine Disruptors (organising committee)                                                                                                                                                                                                                                                                             |
| Dr Sophie von der Heyden    | 15th South African Marine Science Symposium (chair: organising committee)                                                                                                                                                                                                                                                                                                                                                                                          |
| Dr Theresa Wossler          | Helderberg Advisory Committee (member)                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Dr Susanna Clusella-Trullas | Insect Invasion Workshop (organising committee)                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Prof. Allan Ellis           | South African Association of Botanists (board secretary)                                                                                                                                                                                                                                                                                                                                                                                                           |

## National and international recognition

|                                           |                                                                                                                                                                                                        |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Dave Richardson & Prof. Guy Midgley | 2014 Thomson Reuters Highly Cited Researchers list of most influential contemporary researchers in their fields of expertise                                                                           |
| Prof. Terry Robinson                      | Chancellor's award for sustained research excellence at SU; Havenga Prize for Life Sciences from the <i>Suid-Afrikaanse Akademie vir Wetenskap en Kuns</i> (South African Academy for Science and Art) |
| Prof. Conrad Matthee & Prof. Guy Midgley  | Elected Fellows of the Royal Society of South Africa                                                                                                                                                   |
| Prof. Michael Cherry                      | Elected Fellow of the African Academy of Sciences                                                                                                                                                      |
| Dr Sophie von der Heyden                  | Elected Young Affiliate of The World Academy of Sciences (TWAS) & awarded the CV Raman Senior Fellowship for African Scientists to conduct research in India                                           |
| Dr Marnel Mouton                          | Lecturer who contributed the most to academic success of top first year student                                                                                                                        |

# DEPARTMENT OF EARTH SCIENCES

THE DEPARTMENT OF EARTH SCIENCES IS ONE OF THE OLDEST ACADEMIC DEPARTMENTS AT STELLENBOSCH UNIVERSITY, WITH A HISTORY THAT GOES BACK TO THE TEACHING OF 'ELEMENTARY GEOLOGY' AT THE STELLENBOSCH SCHOOL FROM 1840 TO 1865. TODAY THE DEPARTMENT IS HOME TO 15 RESEARCHERS AND OVER 30 POSTGRADUATE STUDENTS.

[Publication list](#)[NRF-rated researchers](#)[Staff list](#)[Contact us](#)

## Research interests

### Environmental geochemistry

- Trace-element and isotope geochemistry
- Marine geochemistry
- Hydro-geochemistry
- Pollution

### Applied Geology

- Tectonics and orogenic processes
- Sedimentology and palaeontology
- Petrogenesis of granite rocks
- Metamorphic petrology
- Experimental petrology
- Shear-zone hosted gold deposits
- Massive sulphide deposits
- Heavy mineral placer deposits
- Metallogenesis of mobile belts

## Research highlights

The Department significantly increased its research outputs in 2014, while Dr Susanne Fietz became the sixth staff member to be rated by the National Research Foundation:

### Accredited publication outputs 2010-2014



### DEPARTMENTS:

[Botany and Zoology](#)[Earth Sciences](#)[Chemistry and Polymer Science](#)[Biochemistry](#)[Mathematical Sciences](#)[Microbiology](#)[Physics](#)[Physiological Sciences](#)[HOME PAGE](#)



| Internationally acclaimed researcher |                                                             |
|--------------------------------------|-------------------------------------------------------------|
| Prof. JS Buick                       | metamorphic petrology, geochronology & isotope geochemistry |
| Prof. JD Clemens                     | granite petrogenesis                                        |
| Prof. A Kisters                      | structural geology                                          |
| Prof. G Stevens                      | experimental petrology                                      |
| Established researcher               |                                                             |
| Dr S Fietz                           | marine biogeochemistry                                      |
| Prof. A Roychoudhury                 | environmental geochemistry & hydrology                      |

## National and international collaboration

During 2014 we collaborated with 103 institutions from 27 countries. Our most significant international collaborators are institutions from Germany (16), the United States (10) and France (9), while closer to home we worked with institutions from Cameroon, Namibia and Uganda.

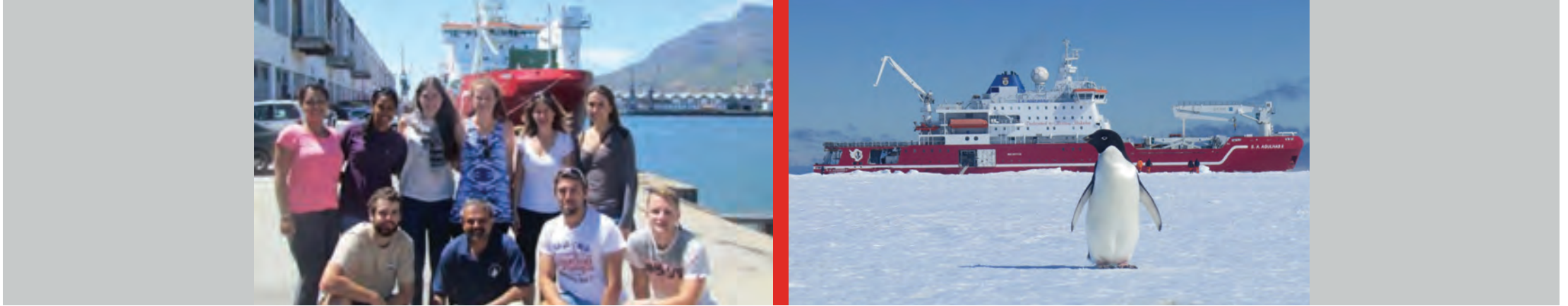


## Focus on postgraduate studies

We have a large cohort of Honours students (22), with eight MSc and three PhD students. Nearly a third of our postgraduate students are from the designated BCI groups and the ratio male to female on postgraduate level is about 2:1. During 2014 we hosted two postdoctoral fellows, Dr M. Garcia Arias (Spain) and Dr V van Schijndel (Netherlands).

## Science on board the SA Agulhas II

Eight of our postgraduate students were on board the SA Agulhas II's for its roundtrip to Antarctica in December 2014. They tackled research problems such as the link between the growth of algae in the Southern Ocean, the cycling of essential chemical elements and how that impacts on the levels of CO<sub>2</sub> in the ocean and the atmosphere. [Read more](#)



## Greenlandic expedition

MSc-student Mr Riaan Bothma and Dr Martin Klausen went on a geological expedition to Southeast Greenland, organised by the Royal Geological Survey of Denmark and Greenland (GEUS). This was the last in a series of six expeditions to remap and investigate the North Atlantic Craton. [Read more](#)



## Service to the scientific community

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. JD Clemens     | Igneous and Metamorphic Studies Group, affiliated with the Geological Society of South Africa (founder member); Earth Sciences Ratings Panel for the National Research Foundation (chair)                                                                                                                                                                                                                              |
| Prof. Dirk Frei      | European Science Foundation review panel (permanent member)                                                                                                                                                                                                                                                                                                                                                            |
| Prof. Alex Kisters   | South African Committee for Stratigraphy – Archaean sequences (member); South African Committee for Stratigraphy – Pan-African sequences (chair)                                                                                                                                                                                                                                                                       |
| Dr Jodie Miller      | International Mineralogical Association International Convention (organising committee); Geological Society of South Africa (regional council); Western Cape branch of the Geological Society of South Africa (chair); external moderator for the University of Cape Town (UCT) & Nelson Mandela Metropolitan University (NMMU)                                                                                        |
| Prof. A Roychoudhury | GEOTRACES programme (South African representative & steering committee member); Council for the International Association of GeoChemistry (member); Africa Earth Observatory Network (AEON) (founder member); Marine Research Institute, University of Cape Town (member); Applied Centre for Climate and Earth Systems Science (ACCESS) (steering committee); National Oceanographic Equipment and Planning Committee |
| Prof. Gary Stevens   | Western Cape Expensive Equipment Programme (REEP) (member); Central Analytical Facility (CAF), Stellenbosch University (director); SARCHi chair for Experimental Petrology                                                                                                                                                                                                                                             |

## Editorial activities

|                     |                                                                                                                                                                            |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Alex Kisters  | <i>South African Journal of Geology</i> (editorial board)                                                                                                                  |
| Prof A Roychoudhury | <i>Frontiers in Environmental Sciences: Groundwater Resources and Management</i> (associate editor); <i>Frontiers in Marine Science: Ocean Observation</i> (review editor) |
| Prof. Gary Stevens  | Editorial board member of <i>Lithos</i> , <i>Terra Nova</i> & <i>Metamorphic Geology</i>                                                                                   |

## Research and conferences

Dr Martin Klausen attended the Nordic Geological Winter meeting in Sweden and the Geological Society of America's meeting in Canada. Prof Roychoudhury was host to the ninth meeting of the **GEOTRACES** Scientific Steering Committee; he also did field and experimental work on nanoparticles, funded by the South African National Antarctic Programme (SANAP). Prof Alex Kisters was involved with projects in Namibia which involved field work, structural mapping, sampling and student supervision (NRF-funded Donkerhuk project, Omitiomire Cu project for Craton Mining and Holland's Dome U project for Swakop Uranium). Prof Gary Stevens is the grant-holder for the bilateral SA-France CNRS project on the origin and recycling of the Kaapvaal craton felsic crust (2013-2015).

## Awards to staff and students

Dr M Klausen, Dr Jodie Miller and Prof. A Roychoudhury received the SU's Rector's award for general performance. Ms Swana Kelley was awarded the Best Student Poster at the congress of the International Association of Hydrogeologists in Morocco.

## Staff matters

The Department welcomes Dr R Tucker as the new lecturer in sedimentology and takes leave of Prof. Abraham Rozendaal who retired after nearly 25 years at SU.

# DEPARTMENT OF CHEMISTRY AND POLYMER SCIENCE

THE DEPARTMENT OF CHEMISTRY AND POLYMER SCIENCE IS ONE OF THE PRE-EMINENT RESEARCH DEPARTMENTS IN CHEMISTRY IN SOUTH AFRICA. WE ARE ENGAGED IN A WIDE RANGE OF RESEARCH AREAS, INCLUDING THE LARGEST RESEARCH EFFORT IN POLYMER SCIENCE IN THE COUNTRY.

## Research interests

Organic chemistry & medicinal chemistry

Inorganic chemistry & organometallic chemistry

Analytical chemistry

Polymer science

Physical & computational chemistry

Supramolecular chemistry & materials

## Research outputs

During 2014 we continued to publish research articles in high-impact journals, some of them among the top 1% of the world's leading scientific journals such as *Chemical Communications*, *Analytical Chemistry*, *Angewandte Chemie International Edition* and *Inorganic Chemistry*. Seven primary research papers from our Department were included in Nature Index 2015 – a unique database that tracks down which institutions made the biggest absolute contribution to high-quality scientific research in a field, region or globally. In Africa, Stellenbosch University leads the chemistry field in terms of outputs per institution:

| Institution                                       | AC | FC   | WFC  |
|---------------------------------------------------|----|------|------|
| 1. Stellenbosch University (SU)                   | 7  | 6.27 | 6.27 |
| 2. University of Cape Town (UCT)                  | 5  | 1.50 | 1.50 |
| 3. University of the Free State (UFS)             | 4  | 1.39 | 1.39 |
| 4. Cape Peninsula University of Technology (CPUT) | 2  | 1.27 | 1.27 |
| 5. University of KwaZulu-Natal (UKZN)             | 5  | 1.01 | 1.01 |
| 6. University of the Western Cape (UWC)           | 2  | 0.90 | 0.90 |
| 7. University of Johannesburg (UJ)                | 1  | 0.88 | 0.88 |
| 8. Nelson Mandela Metropolitan University (NMMU)  | 1  | 0.80 | 0.80 |
| 9. Université Constantine 1                       | 2  | 0.57 | 0.57 |
| 10. University of Carthage (UCAR)                 | 2  | 0.44 | 0.44 |

[Publication list](#)

[NRF-rated researchers](#)

[Staff list](#)

[Contact us](#)

## DEPARTMENTS:

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[Earth Sciences](#)

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[Microbiology](#)

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[Physiological Sciences](#)

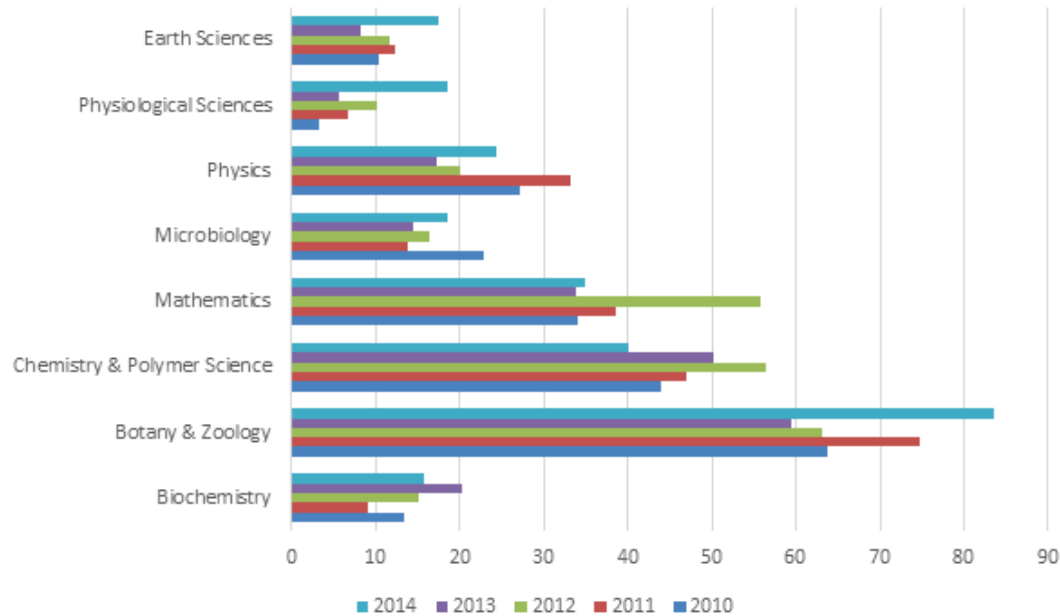


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## Research profile

The Faculty of Science's audited research output for publication years 2011 to 2014 shows that we are among the top three departments in the Faculty in terms of audited research outputs. A review of publications that appeared in 2013 and which qualified as being in the top 20% (or higher) in terms of impact factor within specific subcategories of research as defined in the Web of Science, also shows our Department among the top two.

Accredited publication outputs per department per publication year



Currently 18 (60%) of our academic staff members hold NRF-ratings and we are home to two of the four A-rated scientists in chemistry in South Africa – Prof. Bert Klumpermann and Prof. Len Barbour. Prof. Klumpermann and Prof. Barbour also hold two of the eight research chairs in the Faculty – the South African research chairs (SARChI) in Advanced Macromolecular Architectures and in Nano-structured Functional Materials.



The average age of our academic staff is only 46 years, which indicates that we are a relatively “young” department. All but one of our academic staff members hold a PhD degree.

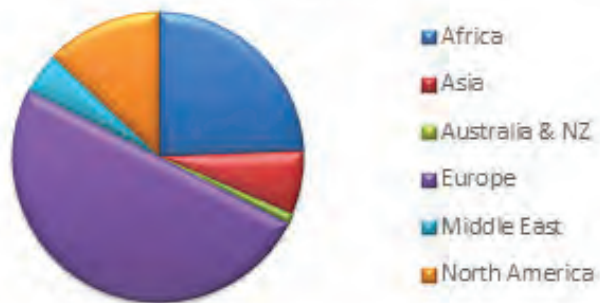


## Age profile of academic staff

| Post level                  | Average age |
|-----------------------------|-------------|
| Professor                   | 55.8        |
| Associate Professor         | 45.6        |
| Senior Lecturer             | 43.2        |
| Lecturer                    | 41.1        |
| <b>Departmental average</b> | <b>46</b>   |

During 2014, the Department hosted 17 postdoctoral fellows from South Africa (5), India (7), Libya (2), Lesotho (1), Poland (1) and China (1).

Proportion of collaborators per region 2014



## Collaboration

During 2014 we collaborated with 87 institutions from 25 countries – this includes co-authorship on research papers, research visits, staff and postgraduate student exchanges and other projects resulting from several bilateral agreements. While our footprint in South Africa (16) is large, we most often collaborated with institutions in Germany (14) and the United States of America (9). Click on the map below for a comprehensive list of all our collaborators.



## Editorial activities

|                          |                                                                                                                                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Len Barbour        | <i>Comprehensive Supramolecular Chemistry, a proposed nine volume reference work (Elsevier) (Co-editor in chief); New Journal of Chemistry (editorial board)</i>                        |
| Prof. Willem van Otterlo | <i>South African Journal of Chemistry (editor)</i>                                                                                                                                      |
| Prof. Bert Klumperman    | <i>European Polymer Journal (editor); Transactions of the Royal Society of South Africa (editor-in-chief &amp; editorial advisory board)</i>                                            |
| Prof. Harald Pasch       | <i>International Journal of Polymer Analysis and Characterization (IJPAC) (editorial board); Polymer International (PI) (editorial board); Springer Laboratory book series (editor)</i> |

## Conferences and workshops

Our researchers presented at 23 national and international conferences during 2014 and we were well-represented at African and international activities to celebrate the International Year of Crystallography. Most notable are the number of plenaries, keynote lectures and invited lectures presented by our researchers: Prof. Harald Pasch delivered four invited and two keynote lectures, while Prof. Bert Klumperman delivered two invited and two plenary lectures. Other staff members who were invited as keynote speakers or guest lecturers are Prof. Len Barbour, Prof. André de Villiers, Prof. Catharine Esterhuysen and Prof. Peter Mallon.

During 2014 the Department hosted two international conferences:

- South African Chemistry Institute and American Chemical Society Bi-National Organic Chemistry Conference (BOCC 2014) and
- 22nd World Forum on Advanced Materials (POLYCHAR22)



Prof. Selwyn Mapolie delivered the prestigious P.D. Hahn Memorial Lecture at the University of Cape Town.

## Service to the scientific community

|                      |                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dr GE Arnott         | Western Cape Branch of the South African Chemical Institute (committee member); National Research Foundation Thuthuka and Blue Skies panel member; NRF Competitive Programme for Rated Researchers panel; NRF Competitive Support for Unrated Researchers panel; 2014 Frank Warren Conference (vice-chair)                                                        |
| Prof. AJ de Villiers | Western Cape Board of the Chromatographic Society of South Africa (ChromSA) (chair)                                                                                                                                                                                                                                                                               |
| Prof. C Esterhuysen  | South African Crystallography Society (SACrS) (president); International Union of Crystallography Congress (South African representative)                                                                                                                                                                                                                         |
| Prof. KR Koch        | International Conference on Coordination Chemistry (SA representative on executive planning committee)                                                                                                                                                                                                                                                            |
| Prof. L Klumperman   | Royal Dutch Chemical Society (member); American Chemical Society (member); South African Chemical Institute (member); International Society for Biomedical Polymers and Polymeric Biomaterials (member); Council of the Royal Society of South Africa (member); Nanotechnology/drug and vaccine development at the African Cancer Institute (focus area champion) |

|                     |                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dr R Malgas-Enus    | National Research Foundation Innovation and Free-standing PhD and Postdoc applications (panel)                                                                                                                                                                                                                                                                                |
| Prof. PE Mallon     | Western Cape Section of the South African Chemical Institute (chair); 22nd World Forum on Advanced Materials POLYCHAR 22 (chair of the organising committee); National Council of the South African Chemical Institute (SACI) (member); International Scientific Committee of the World Forum on Advanced Materials (POLYCHAR) (member); NRF Blue Skies review panel (member) |
| Prof. SF Mapolie    | Catalysis Society of South Africa (executive committee)                                                                                                                                                                                                                                                                                                                       |
| Prof. H Pasch       | International Symposium on Polymer Analysis and Characterization (governing board)                                                                                                                                                                                                                                                                                            |
| Dr R Pfukwa         | National Research Foundation Doctoral Scholarship Program (panel); National Research Foundation SA-Romania Research Cooperative (panel); South Africa-United Kingdom Scientific Seminar (organiser)                                                                                                                                                                           |
| Prof. AJ van Reenen | World Forum on Advanced Materials Conference POLYCHAR 22 (local organiser)                                                                                                                                                                                                                                                                                                    |

## National and international recognition

Stellenbosch University recognised two of our researchers for research excellence: Prof. Harald Pasch and Prof. Bert Klumperman were honoured with the title Distinguished Professor, and Prof. Pasch and Prof. Klaus Koch received the Vice-Rector's award for research excellence. On a national and international level we also performed well:

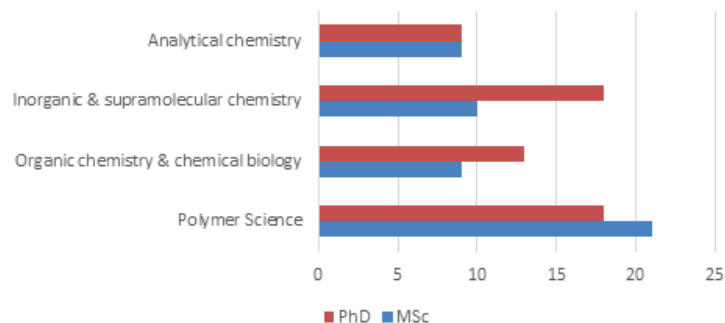
|                         |                                                                                                                                                         |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Len Barbour       | 2014 South African Chemical Institute's Gold Medal for outstanding research                                                                             |
| Prof. André de Villiers | LCGC Emerging Leader in Chromatography Award; One of the 'Top 40 under 40' analytical scientists worldwide, selected by <i>The Analytical Scientist</i> |
| Prof. Harald Pasch      | Elected Fellow of the Royal Society of South Africa                                                                                                     |
| Dr Pfukwa Rueben        | Jürgen Springer Prize for a Young Scientist, POLYCHAR-22 World Forum on Advanced Materials                                                              |
| Prof. Klaus Koch        | Fellowship & Life Member of the South African Chemical Institute                                                                                        |
| Dr Rehana Malgas-Enus   | Higher Education Consortium/Western Cape Government Special University Fund awarded in support of community interaction projects                        |
| Prof. Delia Haynes      | Royal Society of Chemistry Journals international authors travel grant                                                                                  |



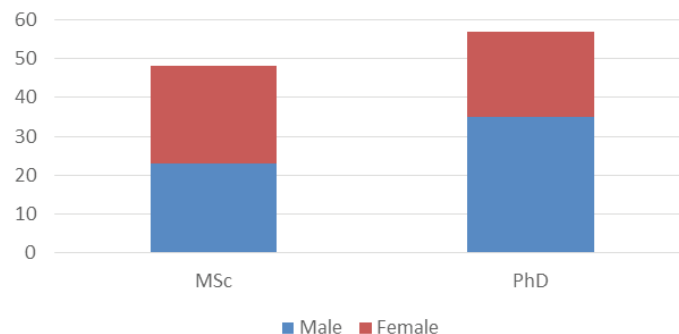
## Focus on postgraduate students

THE DEPARTMENT HAS A LARGE COHORT OF 107 FULL-TIME POSTGRADUATE STUDENTS – 49 MSc AND 58 PHD STUDENTS. DURING 2014 WE DELIVERED 15 MSc AND SEVEN PHD GRADUATES.

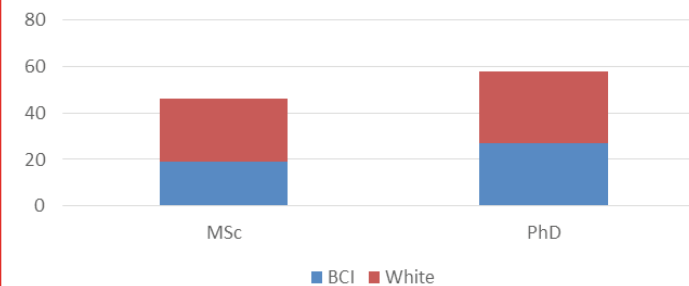
Distribution of postgraduate students per main supervisors



Gender profile of postgraduate students



Diversity profile of postgraduate students 2014



The AlchemUS society, established in 2011, again presented their annual magic show to much amusement

[View here](#)

Our postgraduate students did exceptionally well at several national and international conferences:

|                              |                                                                                     |
|------------------------------|-------------------------------------------------------------------------------------|
| Ms Chandré Willemse          | Best Oral presentation: Chromatography, Analytika 2014                              |
| Ms Shani Barkhuysen          | Royal Society of Chemistry Best Student Poster Prize (spectroscopy), Analytika 2014 |
| Ms Varia Nikolayenko         | Best oral presentation, SACI/RSC Western Cape Student Symposium 2014                |
| Ms Leandi van der Westhuizen | Wilhelm Frank PhD Scholarship                                                       |

### Staff matters

Three Research Career Advancement Fellows (RCA) joined the Department in 2014 – they are Dr Nonjabulo Gule, Dr Vincent Smith and Dr Andreas Tredoux. Mr EJ Lukhele and Ms C Hendrickse joined our technical staff.

# DEPARTMENT OF BIOCHEMISTRY

OUR RESEARCH IS POSITIONED AT THE INTERSECTION OF CHEMISTRY AND BIOLOGY, MOVING FROM MOLECULAR STRUCTURES VIA MACROMOLECULAR ACTIVITY TO BIOLOGICAL FUNCTION. RESEARCH TOPICS RANGE FROM APPLIED STUDIES IN WASTE WATER TREATMENT, POTATO VIRUS SPREAD, CONTRACEPTIVES, DRUG DISCOVERY AND MALARIA TO FUNDAMENTAL WORK IN SYSTEMS BIOLOGY AND P450 FUNCTION.

## Research interests

Systems biology

Steroids research

Drug & biocide  
discovery

Plant bioinformatics &  
molecular systematics

Immunology, pathology  
& pathogen detection

## Research profile

Prof. Marina Rautenbach registered a new patent via Innovus, Stellenbosch University's technology partner. The patent, Antimicrobial cyclic peptide compositions for plants, aims to reduce the microbial infection of fresh produce and is now available for licensing. This is a novel technology to meet the growing demand for natural biocontrol agents as the world moves to more natural and organic farming practices.

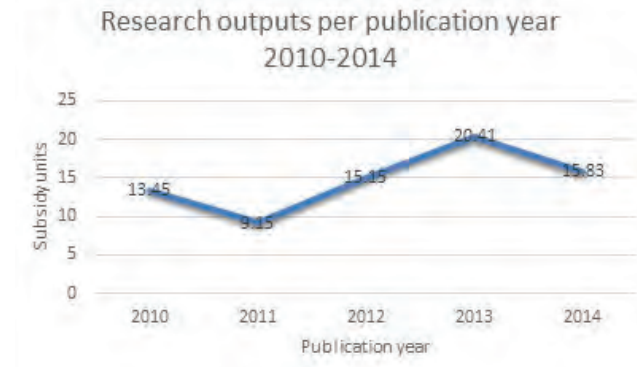


Figure 1 The graph above is based on the audited units for the Department of Biochemistry's research output for publication years 2010-2014.

## NRF-rated researchers

Eight of our 14 staff members are rated by the National Research Foundation. The Department is also home to the South African Research Chair (SARCH) in Mechanistic Modelling of Health and Epidemiology, held by Prof. Jackie Snoep.



[Publication list](#)

[NRF-rated researchers](#)

[Staff list](#)

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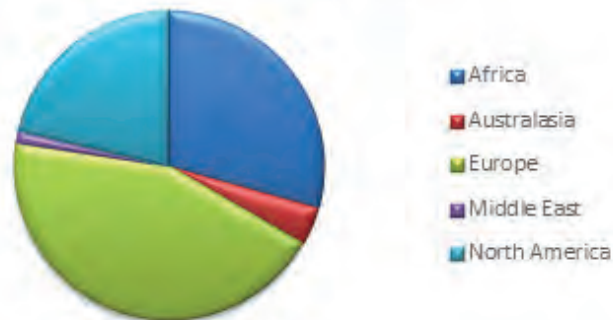


## National and international collaboration

**The Department has a large footprint in South Africa, specifically working with agricultural research institutes and food companies such as:**

- Elsenburg Agricultural College
- Grootfontein Agricultural Development Institute
- Human Sciences Research Council (HSRC)
- Karl Bremer Hospital
- Klein Karoo Group: Research and Development
- Medical Research Council (MRC)
- Mohair South Africa: Research and Development
- Potatoes South Africa: Research and Development
- Rhodes Food Group: Research and Development
- SABMiller: Research and Development
- South African Rooibos Council: Research and Development

Geographic distribution of  
collaborators in 2014



On an international level, the Department collaborated with 75 institutions from 14 countries, but most often with institutions from the United States (13) and Germany (11). Click on the map below for a comprehensive list of all our collaborators.



Focus on postgraduate students

The Department has 80 full-time postgraduate students – 20 Honours-, 37 MSc- and 23 PhD-students – and we hosted 13 postdoctoral fellows from South Africa (12) and the United Kingdom (1).

Three of the four Phd-students who graduated in 2014 came from Prof. Marina Rautenbach's research group. During 2014 our postgraduate students and postdocs presented at 16 local and nine international conferences.

## Conferences and workshops

The Department hosted two major international conferences in 2014. Prof. Erich Straus delivered a plenary address at the South African Chemical Institute (SACI) and the American Chemical Society (ACS) Bi-national Organic Chemistry Conference (BOCC 2014), held at the Stellenbosch Institute for Advanced Studies (STIAS).

Prof. Dirk Bellstedt was secretary general and chair of the conference organising secretariat for the annual conference of the Association pour l'Etude Taxonomique de la Flore d'Afrique Tropicale (AETFAT). This was the largest botanical conference ever held in South Africa with a total of 270 oral and 205 poster presentations.



Botanists have their  
work cut out for them  
- rector at conference

The Department had a busy year, with staff presenting at nine local and 17 international conferences. Several of our staff members were invited to present their research at workshops or international universities. Prof. Pieter Swart and Dr Donita Africander were invited speakers at the Toxicology Society of South Africa (TOXSA) Workshop. Dr Karl Storbeck was invited to present lectures at the Department of Molecular and Integrative Physiology and Medicine, University of Michigan, and at the Centre for Endocrinology, Diabetes and Metabolism, University of Birmingham. Prof. Johann Rohwer was an invited speaker at the 24th Congress of the South African Society of Biochemistry and Molecular Biology (SASBMB).

## Other national and international conferences where our staff members presented their research include:

5th Cold Spring Harbor Laboratory Meeting on Nuclear Receptors and Disease, United States

Potatoes South Africa Annual Research Conference

20th Congress of the International Organization for Mycoplasma, Brazil

Biochemical Society Focused meeting: Coenzyme A and its Derivatives in Cellular Metabolism and Disease, London

4th International Symposium on Antimicrobial Peptides, France

International Study Group for Systems Biology (ISGSB) 16th Meeting, United Kingdom

ERASysApp and Infrastructure for Systems Biology Europe data management meeting, Germany

Computational Modelling in Biology Network's Harmony meeting, United Kingdom

15th International Conference on Systems Biology (ICSB), Australia

TheWorldAcademy of Sciences (TWAS) food biotechnology course, China

XVIth Congress on the Adrenal Cortex (ADRENAL 2014), United States

Gordon Research Conference on Bioorganic Chemistry, United States

19th World Congress on Advances in Oncology and 17th International Symposium on Molecular Medicine, Greece

## Editorial activities

Prof. DU Bellstedt

*Phytotaxa* (associate editor)

Prof. Ann Louw

*Steroids* (editorial board)

Prof. M Rautenbach

*Journal of Microbiological Methods* (editorial board)

Prof. JM Rohwer

*BioMedCentral Systems Biology* (associate editor); *Frontiers in Plant Systems Biology* (review editor)

Prof. JL Snoep

*Federation of European Biochemical Society Journal* (editor); *Microbiology* (editor); *IET Systems Biology* (editor); *Metabolomics* (editor)

Prof. Amanda Swart

*Scientific Reports* (editorial board)

## Service to the scientific community

Dr D Africander

South African Society of Biochemistry and Molecular Biology (treasurer)

Prof. DU Bellstedt

Technology and Human Resources in Industry Programme (THRIP), Animal Sciences (evaluation panel)

Prof. M Rautenbach

Biochemistry Department, Nelson Mandela Metropolitan University (external examiner)

Prof. JM Rohwer

International Standards for Reporting Enzymology Data Commission (STRENDIA) (member)

Dr Karl Storbeck

South African Society of Biochemistry and Molecular Biology (council member)

Prof. E Strauss

National Research Foundation (evaluation panel)

Prof. Amanda Swart

1st International Rooibos Conference (organising and scientific committee member)



## Awards

This was an exceptional year for Prof Marina Rautenbach. She was the recipient of the [South African Distinguished Woman Scientist Award](#) (winner in the engineering and physical sciences category) and the Vice-Rector's award for research excellence. Prof. Rautenbach and Prof. Ann Louw were also promoted to full professors.

## Staff matters

The Department welcomes Dr M de Villiers, who has been appointed as part of the Research Career Advancement Fellowship Programme (RCA) at Stellenbosch University. The RCA programme provides opportunities for postdoctoral fellows to pursue a career in research and to be mentored for research leadership and academic positions. Our former Departmental Head, Prof. Pieter Swart, was appointed as Vicedean: Research in the Faculty of Science.

## Science communication and media

Prof. Dirk Bellstedt (below right) hosted a group of 23 German science journalists, all members of the Wissenschaftspressekonferenz (WPK). He introduced them to the evolution and diversity of African flora during a guided walk in Jonkershoek Nature Reserve. [Read more](#)



# DEPARTMENT OF MATHEMATICAL SCIENCES

## (Mathematics, Applied Mathematics, Computer Science)

TOGETHER THE DIVISIONS OF MATHEMATICS, APPLIED MATHEMATICS AND COMPUTER SCIENCE FORM THE DEPARTMENT OF MATHEMATICAL SCIENCES AT STELLENBOSCH UNIVERSITY. THE DEPARTMENT HAS 48 ACADEMIC STAFF MEMBERS AND SIX EXTRAORDINARY PROFESSORS AND ASSOCIATE PROFESSORS, A RESEARCH CHAIR AND ONE DST/NRF CENTRE OF EXCELLENCE.

### Research interests

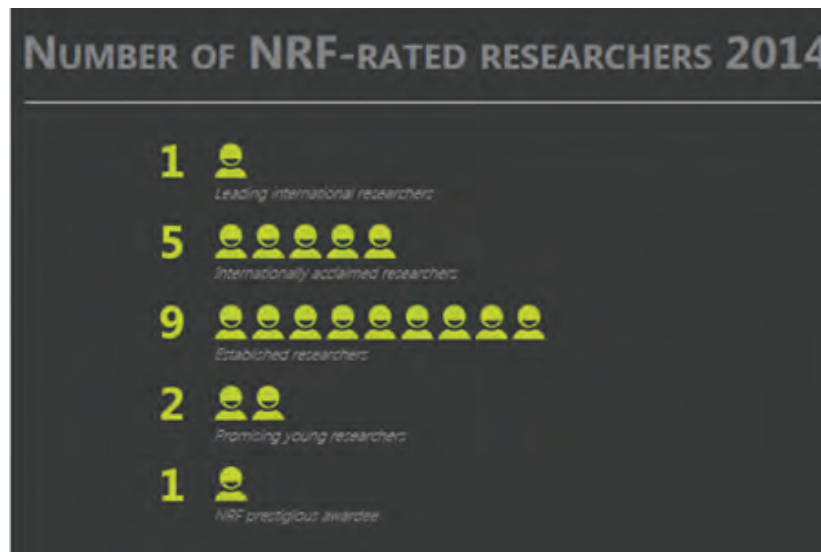
| Mathematics                                                                                                                                                                                                                      | Applied Mathematics                                                                                                                                                                                                                          | Computer Science                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>•Algebra &amp; number theory</li><li>•Analysis &amp; topology</li><li>•Foundations of mathematics</li><li>•Discrete mathematics</li><li>•Mathematics &amp; computational biology</li></ul> | <ul style="list-style-type: none"><li>•Computer vision, pattern recognition, machine learning</li><li>•Fluid dynamics &amp; modelling</li><li>•Numerical analysis &amp; scientific computing</li><li>•Applied Discrete Mathematics</li></ul> | <ul style="list-style-type: none"><li>•Program verification</li><li>•Software engineering</li><li>•Machine learning &amp; computer vision</li><li>•IP networks</li><li>•Automata theory &amp; formal languages</li></ul> |

### Research highlights

Research outputs in Mathematics, Applied Mathematics and Computer Science have been strengthened over the past year. This is reflected by the increased number of publications in journals of high standing, research presentations at national and international conferences, and particularly the strengthening of collaborations with internationally recognised researchers at leading research institutions and industry.

### Research profile

The Department has 18 staff members, including three female scientists, who have been rated by the National Research Foundation. We are home to the DST/NRF Centre of Excellence – the South African Centre for Epidemiological Modelling and Analysis (SACEMA). Together with the African Institute for Mathematical Sciences (AIMS), we co-host the South African research chair (SARCHI) in Mathematical and Theoretical Physical Biosciences, currently held by Prof. Cang Hui.

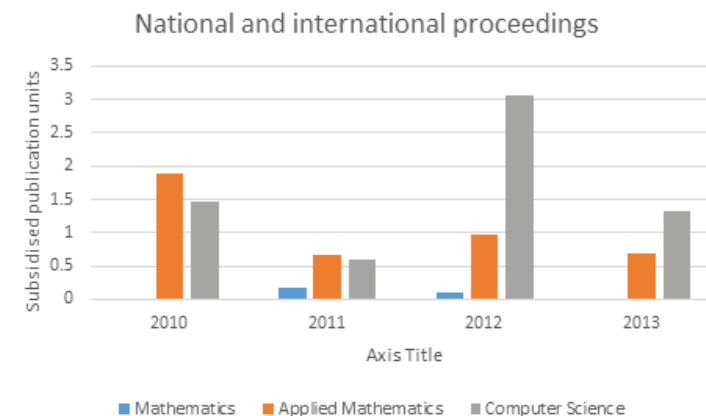
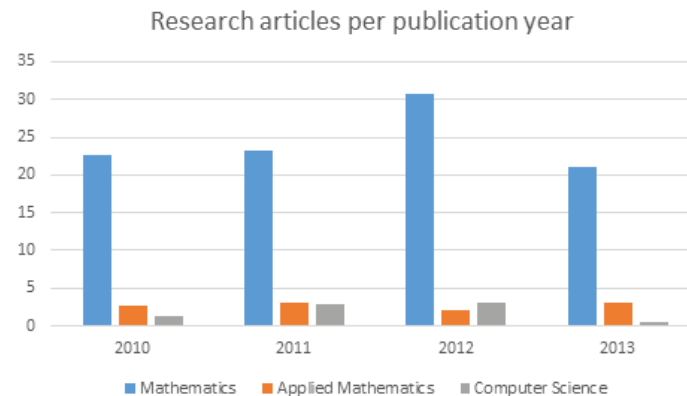
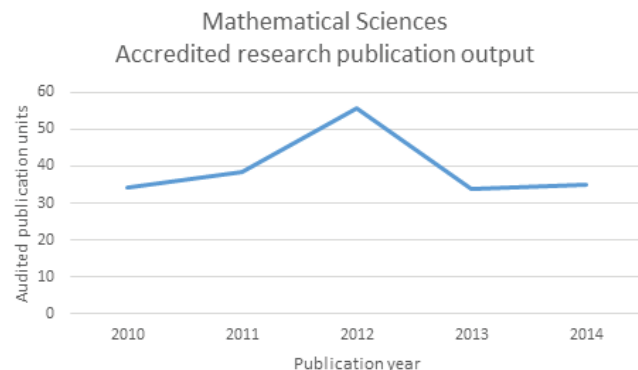
[Publication list](#)[NRF-rated researchers](#)[Staff list](#)[Contact us](#)

#### DEPARTMENTS:

[Botany and Zoology](#)[Earth Sciences](#)[Chemistry and Polymer Science](#)[Biochemistry](#)[Mathematical Sciences](#)[Microbiology](#)[Physics](#)[Physiological Sciences](#)[HOME PAGE](#)



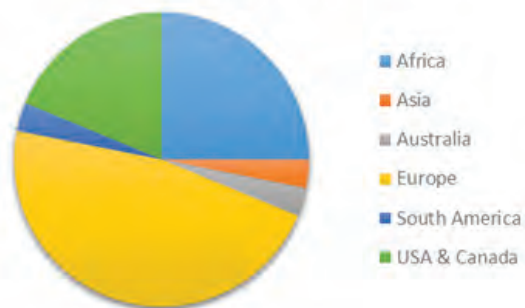
## Research outputs



## National and international collaboration

Collaboration with top international universities and institutions significantly enhances our international visibility and the quality of our research. During 2014 we collaborated with over 30 institutions from 19 countries, most notably with institutions from Europe (15), the United States and Canada (6) and South Africa and Africa (8). These collaborations include research visits, co-authoring of research papers, student and staff exchange programmes and co-presenting of workshops and seminars. Click on the map for a comprehensive list of all our collaborators

Geographic distribution of collaborators



## Local and international recognition for research excellence

Three of our staff members were recognised by top performing first years at Stellenbosch University for their contribution to their academic success in 2013 – they are Dr Karin-Therese Howell, Prof. Lynette van Zijl and Prof. Florian Breuer. Other awards are:

|                      |                                                                                                                                                                                                                                                                                                                        |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Stephan Wagner | Stellenbosch University Vice-Rector: Research and Innovation award (research) for staff member with highest number of publications in 2014                                                                                                                                                                             |
| Prof. Willem Visser  | Most Influential Paper in 2014 award, International Conference on Automated Software Engineering. See Visser et al. Model Checking Programs. Automated Software Engineering, April 2003 Vol 10 (2):203-23                                                                                                              |
| Prof. Bernd Fischer  | Gold Medals for Csqe (Certified Software Quality Engineering) and ESBMC (Efficient SMT-Based Context-Bounded Model Checker) in the 3rd International Competition on Software Verification (SV-COMP14), 20th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2014) |

## Editorial activities

|                           |                                                                                                                        |
|---------------------------|------------------------------------------------------------------------------------------------------------------------|
| Prof. Ingrid Rewitzky     | <i>Quaestiones Mathematicae</i> (associate editor)                                                                     |
| Dr Hennie de Villiers     | <i>IET Computer Vision</i> (reviewer); <i>Journal of Universal Computer Science</i> (reviewer, machine learning)       |
| Prof. Helmut Prodingen    | <i>Theoretical Computer Science</i> (editorial board)                                                                  |
| Prof. Brink van der Merwe | <i>Journal of Universal Computer Science</i> (editorial board)                                                         |
| Prof. Lynette van Zijl    | <i>Journal of Universal Computer Science</i> (editorial board)                                                         |
| Prof. Willem Visser       | <i>Association for Computing (ACM) Transactions on Software Engineering and Methodology (TOSEM)</i> (associate editor) |

## Service to the scientific community

|                           |                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Ingrid Rewitzky     | African Institute for Mathematical Sciences (AIMS) (executive team member)                                                                                                                                                                                                                                                                                                                           |
| Dr Willie Brink           | Consortium for Mathematics and Its Applications: Mathematical Contest in Modelling (team advisor)                                                                                                                                                                                                                                                                                                    |
| Prof. Sonja Mouton        | Workshop on ordered Banach algebras, Lorentz International Center for Workshops in the Sciences, Leiden (scientific organising committee)                                                                                                                                                                                                                                                            |
| Prof. Bernd Fischer       | 13th International Conference on Generative Programming: Concepts & Experiences & Automated Software Engineering (steering committee); International Federation for Information Processing Working Group 2.1 Algorithmic Languages and Calculi (member)                                                                                                                                              |
| Dr Hennie de Villiers     | National Research Foundation rating panel for machine learning (reviewer)                                                                                                                                                                                                                                                                                                                            |
| Dr Karin Howell           | American Mathematical Society (reviewer)                                                                                                                                                                                                                                                                                                                                                             |
| Dr Jaco Geldenhuys        | 2014 Annual Conference of the South African Institute of Computer Scientists and Information Technologists (programme committee); International Symposium on Software Testing and Analysis (ISSTA 2014) (programme committee); 19th International Symposium on Formal Methods (programme committee); FormaliSE 2014 2nd FME Workshop on Formal Methods in Software Engineering (programme committee) |
| Prof. Ben Herbst          | European Union Framework 7 Program: computer vision (coordinator); EDH-CERN (consultant)                                                                                                                                                                                                                                                                                                             |
| Dr Steve Kroon            | 1st International Conference on the Use of Mobile ICT in Africa (programme committee)                                                                                                                                                                                                                                                                                                                |
| Dr Milton Maritz          | Bureau for Industrial Mathematics (BIMUS), Stellenbosch University (director)                                                                                                                                                                                                                                                                                                                        |
| Prof. Farai Nyabadza      | Southern Africa Mathematical Sciences Association (SAMSA) (vice-president); Africa Society for Biomathematicians (ASB) (secretary general); Canon Collins Trust (board member)                                                                                                                                                                                                                       |
| Prof. Brink van der Merwe | 1st International Conference on the Use of Mobile Information and Communications Technology in Africa (UMICTA 2014) (conference organiser); 19th International Conference Implementation and Application of Automata (CIAA) (programme committee member)                                                                                                                                             |
| Prof. Lynette van Zijl    | 25th International Workshop on Combinatorial Algorithm (IWOCA) (IWOCA) (programme committee)                                                                                                                                                                                                                                                                                                         |
| Prof. Willem Visser       | Association for Computing (ACM) Special Interest Group on Software Engineering (SIGSOFT) (executive team member)                                                                                                                                                                                                                                                                                     |

## Conferences and seminars

During 2014 staff presented at more than 25 national and international conferences. This included a plenary address by Prof. Ingrid Rewitzky at the Workshop on Information and Uncertainty in the Czech Republic. Prof. Sonja Mouton also delivered a plenary address at the Workshop on Ordered Banach Algebras in The Netherlands. Two staff members were invited to present lectures: Prof. Leon van Wyk at the University of Louisiana at Lafayette in the USA and Prof. Stephan Wagner at Graz University of Technology in Austria. Prof. Wagner also hosted the 3rd Stellenbosch Workshop on Discrete Mathematics, dedicated to Prof. Helmut Prodinger on the occasion of his 60th birthday.

Staff members also presented at the following national and international conferences:

## Computer Science Division

|                           |                                                                                                                                                                                                                                                                                                            |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Bernd Fischer       | Delivered papers at the 7th International Symposium on High-Level Parallel Programming and Application; the International Conference on Computer-Aided Verification; and the Research Tool Demonstrations Track of the 22nd ACM SIGSOFT International Symposium of the Foundations of Software Engineering |
| Prof. Brink van der Merwe | Conference presentation at the 14th International Conference on Automata and Formal Languages                                                                                                                                                                                                              |
| Prof. Willem Visser       | Conference presentations at the 22nd ACM SIGSOFT International Symposium on Foundations of Software Engineering and the 29th IEEE/ACM International Conference on Automated Software Engineering                                                                                                           |

## Mathematics Division

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dr Bruce Bartlett      | Sabbatical at the University of Oxford, United Kingdom                                                                                                                                                                                                                                                                                                                                                           |
| Prof. Zurab Janelidze  | Contributed talk at Category Theory Conference 2014                                                                                                                                                                                                                                                                                                                                                              |
| Prof. Farai Nyabadza   | Sabbatical at the University of Zimbabwe and the Mathematical Biosciences Institute, Ohio State University                                                                                                                                                                                                                                                                                                       |
| Dr Naina Ralaivaosaona | Contribution at the 25th International Conference on Probabilistic, Combinatorial and Asymptotic Methods for the Analysis of Algorithms (AofA'14); Talk entitled 'The order distribution of subtrees of a tree' at a seminar series in the Department of Mathematics, Heriot-Watt University, Edinburgh; Talk on 'Les représentations en base multiple des nombres entiers' at the Université de Lorraine, Nancy |
| Prof. Leon van Wyk     | Poster presentation, International Congress of Mathematicians (ICM 2014)                                                                                                                                                                                                                                                                                                                                         |
| Prof. Stephan Wagner   | Conference presentation at the 57 <sup>th</sup> annual conference of the South African Mathematics Society                                                                                                                                                                                                                                                                                                       |



### Three of our staff members delivered their inaugural lectures:

Prof. Stephan Wagner – on "Advanced bean counting - the many facts of enumerative combinatorics"

Prof. Lynette van Zijl – "Computer Science is more than just programming".

Prof. Bernd Fischer – "Seeing Things in the Clouds: Browsing Semi-Structured Data with Tag Clouds over Concept Lattices"



## Focus on postgraduate students

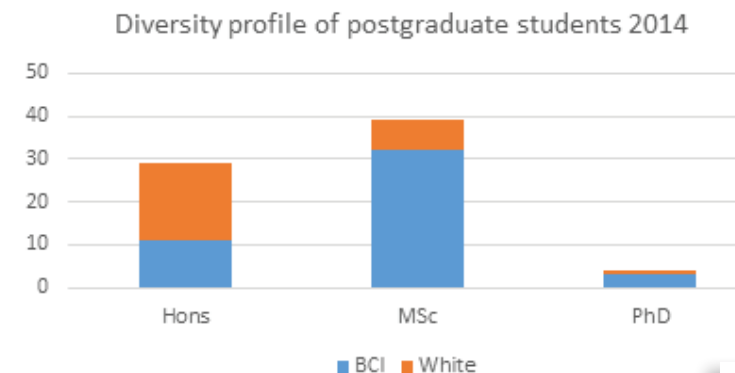
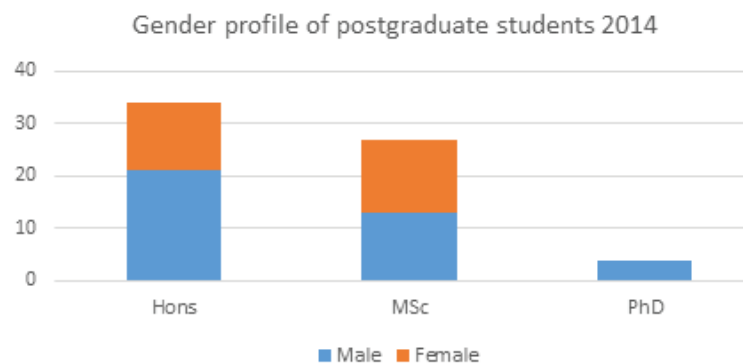
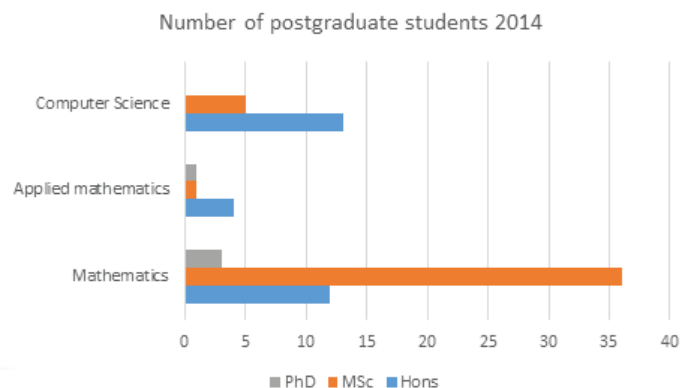
During 2014 the Department had a cohort of over 50 postgraduate students, with another 21 students enrolled at Stellenbosch University through the African Institute for Mathematical Studies (AIMS). Of these, 18 were in the Computer Science Division, six in the Applied Mathematics Division and 51 in the Mathematics Division.

While the gender profile of our postgraduate students remain a challenge, we are confident about their diversity and thereby continue to support institutes such as AIMS. This is evident from the number of our staff members who lectured or acted as supervisors for MSc and PhD students at the institute:

**Lecturers:** Prof. Stephan Wagner and Dr Dimbinaina Ralaivaosaona (mathematical problem solving); Dr Gareth Boxall (model theory) and Prof. Johan de Villiers (wavelets and subdivision).

**Supervisors:** Prof. Florian Breuer, Prof. Zurab Janelidze, Prof. Stephan Wagner, Prof. Arnold Keet, Prof. Francois Smit, Dr Hardus Diedericks and Prof. Mapundi Banda.

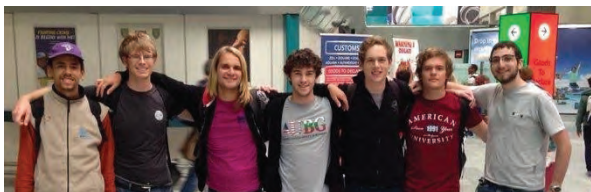
We also hosted five postdoctoral fellows from South Africa (3), Madagascar (1) and the United Kingdom (1).



## National and international recognition

Participation of undergraduate and postgraduate students in national and international contests were encouraged by Prof. Stephan Wagner, Dr Steve Kroon and Dr Willie Brink. Two MSc computer science students performed particularly well: Mr Rijnard van Tonder was the runner-up in the 'IBM Beat the Mainframe' competition in New York. Together with Mr **Jacques Marais** he also developed an app called WorkMode which won the student category of the Ericsson Mobile App competition. [Read more](#)

Our Mathematics students performed well at the International Mathematics Competition (IMC) which took place in Bulgaria, as well as the third South African Tertiary Mathematics Olympiad. The Mathematics Division was closely involved with the International Mathematics Olympiad which, for the first time, took place in South Africa. They are Prof. Florian Breuer (coordinator), Prof. Stephan Wagner (problem selection committee and problem captain) and Prof. Dirk Laurie (head coordinator), as well as several postgraduate students.



*Taking part in the International Mathematics Competition in Bulgaria From the left, the team members were Liam Baker (Team Leader), Mark Chimes (US), Dylan Nelson (UCT), Petri-Johan Last (US), Elrich Groenewald (US), Michael Hoefnagel (US) and Robert Spencer (UCT).*

Students from the Mathematics Division participated in the International Mathematics Competition (IMC) which took place in Blagoevgrad (Bulgaria) from 29 July to 4 August 2014. Mark Chimes, Elrich Groenewald, Michael Hoefnagel and Petri-Johan Last, accompanied by Liam Baker (MSc student and former IMC gold medallist), competed against 324 students from 73 universities. The team almost tripled last year's score (from 28 to 77) and earned three honourable mentions.

Mathematics student Mr Thomas Weighill was the recipient of the prestigious Chancellor's Medal awarded to the most deserving student to obtain a degree at Stellenbosch University, as well as the S2A3 Medal, awarded by the Southern Africa Association for the Advancement of Science to commend outstanding South African science research students graduating at the Masters level.

Dr Dirk Basson received a postdoctoral fellowship from Leiden University.

## Staff matters

During 2014 Dr MA Muller retired and Prof M Banda and Dr Stefan van der Walt resigned. We welcome two new appointments, Dr J Brink and Dr R Roux.



# DEPARTMENT OF MICROBIOLOGY

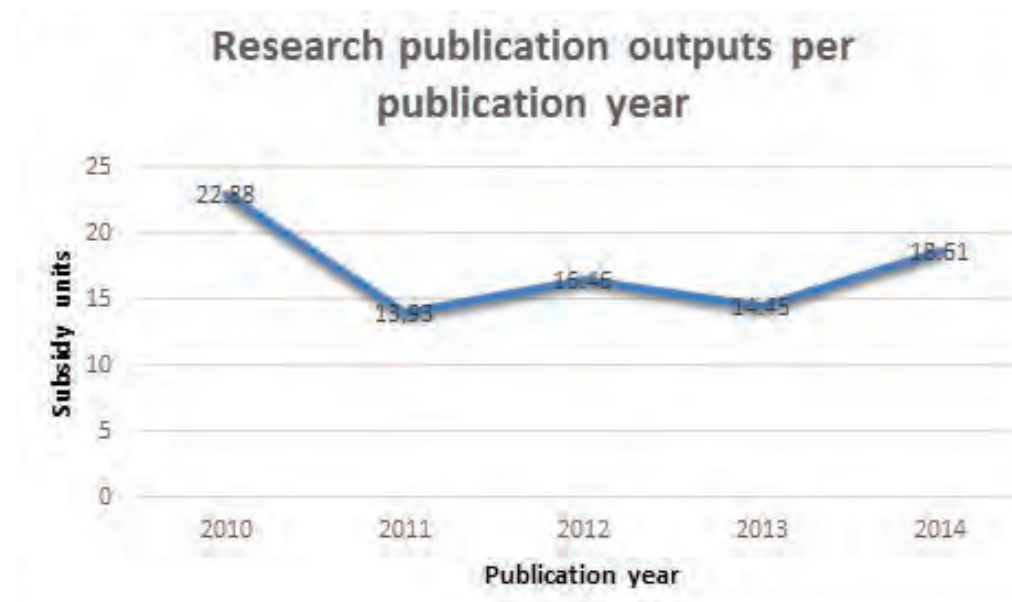
THE DEPARTMENT OF MICROBIOLOGY'S HISTORICAL ROOTS CAN BE TRACED BACK TO 1918 WHEN PLANT PATHOLOGY WAS RECOGNISED AS A FIELD OF EXPERTISE IN THE THEN FACULTY OF AGRISCIENCES. TODAY, THE DEPARTMENT HAS AN ACADEMIC STAFF COMPLEMENT OF 16 FULL-TIME RESEARCHERS, EXTRAORDINARY PROFESSORS AND RESEARCH ASSOCIATES, WORKING IN NINE RESEARCH GROUPS WITH THEIR OWN STATE-OF-THE-ART LABORATORIES.

## Research interests

|                                         |                                  |
|-----------------------------------------|----------------------------------|
| Biological processing of plant material | Taxonomy of lactic acid bacteria |
| Taxonomy of ascomycetes fungi           | Environmental microbiology       |
| Bioprospecting                          | Microbial ecology                |
| Waste water treatment technologies      | Energy research: biofuels        |

## Research outputs

The Department increased the number of research articles published in accredited journals from 30 in 2013 to 34 in 2014 with an average JCR impact factor of 2.9.



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[NRF-rated researchers](#)

[Staff list](#)

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## New research chair

**Prof. Gideon Wolfaardt**, a recognised expert and leading researcher in the biological and engineering aspects of water research, is the first research professor to hold the new Research Chair in Wastewater Management, hosted at the Stellenbosch University Water Institute (SUWI). The focus of the chair will be on scientific and technical advances in wastewater management, water quality, water use and demand, and fostering partnerships to improve the water research and management skills of scientists, engineers and technical personnel. Photo: Anton Jordaan

[Read more](#)

## Research and innovation

Two projects originating from the research by postgraduate students in the labs of Prof. Heinrich Volschenk and Prof. Leon Dicks were registered with Innovus, Stellenbosch University's technology partner:

- Improved beta-fructofuranosidase enzyme variant for short-chain fructooligosaccharide (sFOS) production
- A nanowire-array biosensor for the detection and quantification of antigens from pathogenic microorganisms and antibodies directed towards specific antigens – [read more](#)

## Collaboration

Nationally, the Department collaborated with Rhodes University, the Cape Peninsula University of Technology and the Universities of KwaZulu-Natal and the Western Cape, as well as industry partners such as the East Rand Water Care Company (ERWAT) and Eskom. On an international level, research groups collaborated mostly with institutions from North America and Europe.



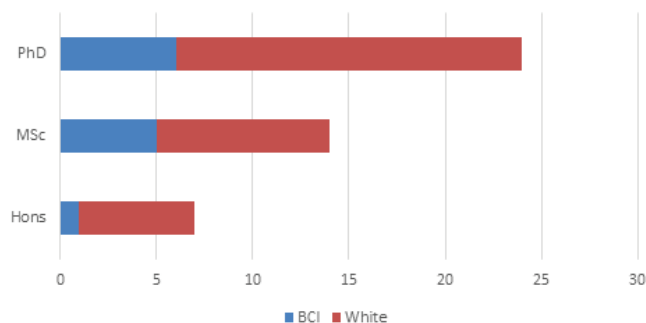
## NRF-rated researchers

Most of our academic staff have been rated by the National Research Foundation as internationally acclaimed (4) or established researchers (3).

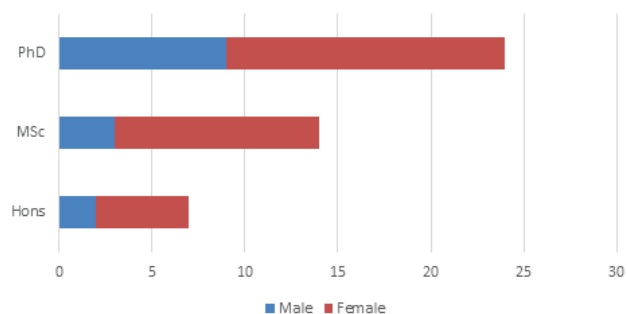
## Focus on postgraduate students

During 2014 the Department had a cohort of 45 postgraduate students – seven Honours, 14 MSc and 24 PhD students. Of this group, three MSc and two PhD students graduated, while our former head of department and acting dean, Prof. Douglas Rawlings, earned the much coveted Doctor of Science degree. The Department also hosted six postdoctoral fellows from South Africa (5) and India (1).

Diversity profile of postgraduate students



Gender profile of postgraduate students



## Conferences and workshops

Staff and postgraduate students presented at a number of conferences, such as the:

- First Global Soil Biodiversity Conference, France
- Bioenergy Workshop, South Africa
- 4th International Conference on Novel Enzymes, Belgium

PhD student Mr Ferdinand Postma attended an Advanced Course on Environmental Biotechnology at Delft University of Technology in The Netherlands.

## Editorial activities

|                    |                                                                                                                                                                                                                                                                                                              |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. A Botha      | <i>Canadian Journal of Microbiology</i> (editorial board); <i>FEMS Yeast Research</i> (editorial board);                                                                                                                                                                                                     |
| Prof. LMT Dicks    | <i>Probiotics and Antimicrobial Proteins</i> (editorial board); <i>Beneficial Microbes</i> (editorial board); <i>Annals of Microbiology</i> (editorial board); <i>Bioscience of Microbiota, Food and Health</i> (editorial board); <i>South African Journal of Enology and Viticulture</i> (editor-in-chief) |
| Prof. K Jacobs     | <i>Mycology</i> (editorial board)                                                                                                                                                                                                                                                                            |
| Prof. GM Wolfaardt | <i>Canadian Journal of Microbiology</i> (assistant-editor); <i>Applied and Environmental Microbiology</i> (editorial board)                                                                                                                                                                                  |

## Service to the scientific community

|                   |                                                                                                                                                                                                            |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. A Botha     | Water Research Commission projects (reference group member); Materials Research Group (MRG) Users Advisory Board of the BioImprove Programme in Sweden (member); South African Academy of Science (member) |
| Prof. TE Cloete   | Water Research Commission (member); Council for Scientific and Industrial Research (board member)                                                                                                          |
| Prof. LMT Dicks   | South African Academy of Science (member)                                                                                                                                                                  |
| Dr W Kahn         | Royal society of Chemistry (member)                                                                                                                                                                        |
| Prof. B Prior     | South African Academy of Science (member)                                                                                                                                                                  |
| Prof. DE Rawlings | South African Academy of Science (member)                                                                                                                                                                  |
| Prof. WH van Zyl  | 20th International Symposium on Alcohol Fuels (ISAF) (chair); BioImprove Programme Sweden (advisory board); South African Academy of Science (member)                                                      |
| Dr H Volschenk    | South African Society for Microbiology (SASM) (member & publications secretary)                                                                                                                            |
| Prof. G Wolfaardt | Stellenbosch University Water Institute (director)                                                                                                                                                         |

## Funding

The Department secured international funding from the University of Antwerpen (Belgium), the British Council (United Kingdom), Nuclear Waste Management Organization (Canada) and the Natural Sciences and Engineering Research Council of Canada. On a national level, major new funders from the private sector includes Eskom, Exxaro, FlowCentric and the East Rand Water Care Company (ERWAT).



# DEPARTMENT OF PHYSICS

THE DEPARTMENT OF PHYSICS AT STELLENBOSCH UNIVERSITY HAS A PROUD HISTORY IN PHYSICS, PRODUCING OUTSTANDING RESEARCH AND MANY EXCELLENT GRADUATES SINCE 1903. WE OFFER FOCUSSED STUDY PROGRAMMES IN NUCLEAR, RADIATION AND HEALTH PHYSICS, THEORETICAL PHYSICS AND LASER PHYSICS ON UNDERGRADUATE AND POSTGRADUATE LEVEL.

## Research interests

### Theoretical physics

- Condensed matter
- Complexity

### Nuclear physics

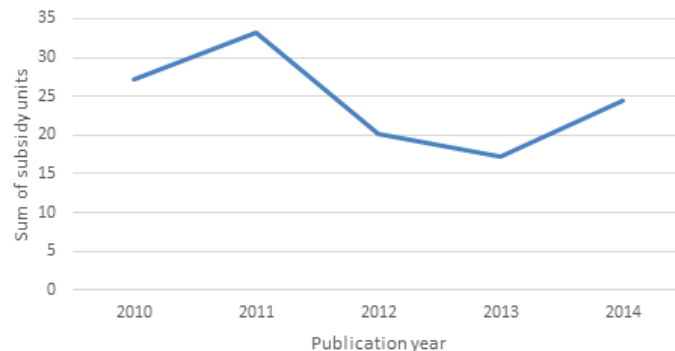
- Nuclear structure
- Nuclear reaction mechanisms
- Radiation and health physics
- Applied nuclear physics
- Physics education

### Laser physics

- Spectroscopy
- Ultrafast science

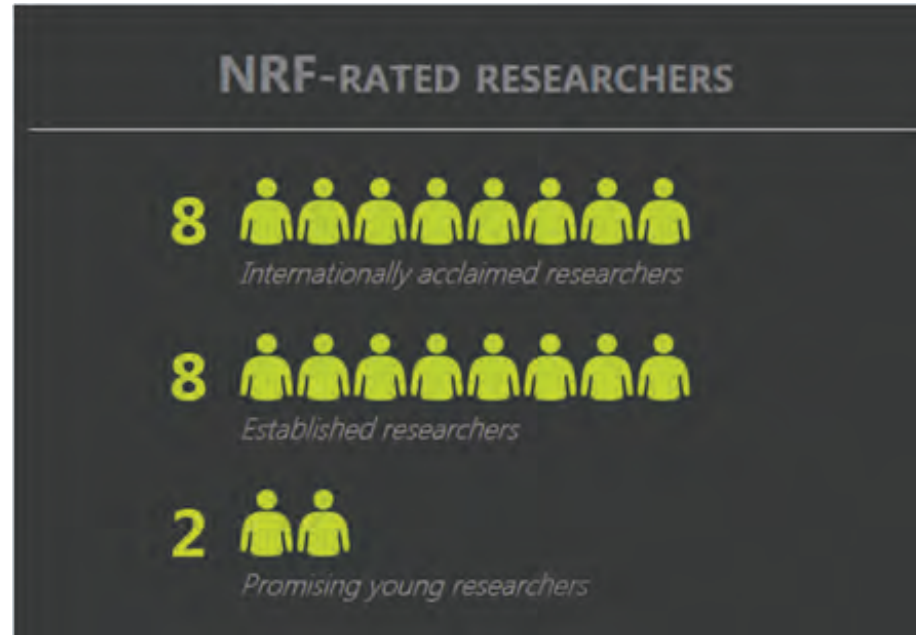
## Research activities

Accredited publication outputs



## NRF-rated researchers

In 2014 four staff members were newly rated by the National Research Foundation – they are Prof. H Touchette, Dr F Cinti, Dr JJ van Zyl and Dr Pieter Neethling.



[Publication list](#)

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Dr Christine Steenkamp was the principle organiser for the Women in Physics in South Africa (WiPiSA) 'Women in Physics Lunch' held at Stellenbosch University in September 2014. Photo: Wiida Fourie-Basson



Prof. Erich Rohwer was chair of the African Laser Centre's workshop on femtosecond laser spectroscopy, hosted at the Department of Physics at SU.

## Conferences and other research activities

|                          |                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. HC Eggers          | Received research visits from Prof. Thomas Trainor, Center for Experimental Nuclear Physics and Astrophysics, University of Washington (USA) and Dr P Lipa from Nielsen Consulting                                                                                                                                                                  |
| Prof. KK Müller-Nedebock | Invited speaker at the 14th Dresden Polymer Discussion: Understanding of Reinforcement in Polymer Networks and Melts, Leibniz-Institut für Polymerforschung, Dresden (Germany); attended the Physics of Soft and Biological Matter Conference, European Physical Society (United Kingdom)                                                           |
| Dr Pieter Neethling      | Presented at the South African Institute of Physics Annual Conference (South Africa)                                                                                                                                                                                                                                                                |
| Prof. RT Newman          | Journal of Environmental Radioactivity (Elsevier) (editorial board)                                                                                                                                                                                                                                                                                 |
| Prof. HPH Schwoerer      | Presented at Physikalische Chemie, Fritz-Haber Institut der Max-Planck Gesellschaft (Germany); Physikalisches Institut, University of Würzburg (Germany); L'Institut de Physique, Université de Rennes (France); Gordon Research Conference on Ultrafast Dynamics in Cooperative Systems (USA); Department of Chemistry, McGill University (Canada) |
| Prof. H Weigel           | Presented paper at the annual conference of the South African Institute of Physics                                                                                                                                                                                                                                                                  |



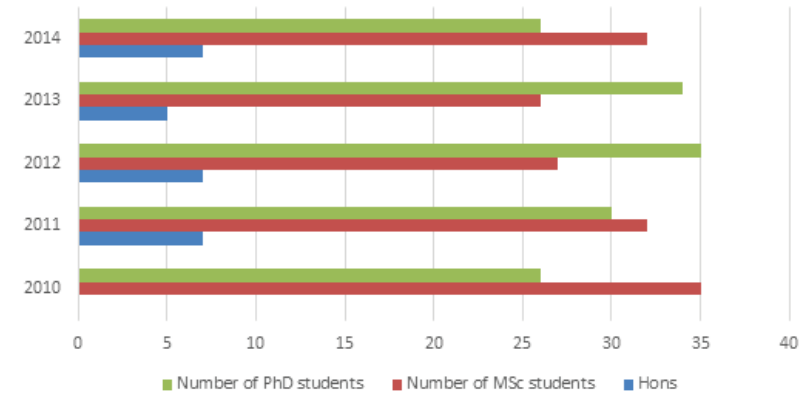
## Focus on postgraduate students

During 2014 the Department produced 12 MSc and eight PhD graduates from a large cohort of 65 postgraduate students registered (seven Honours, 32 MSc and 26 PhD students). In a first for South Africa, Dr Melanie McLaren (29) produced the first quantum entanglement experiment in Africa as part of her research into quantum optics.

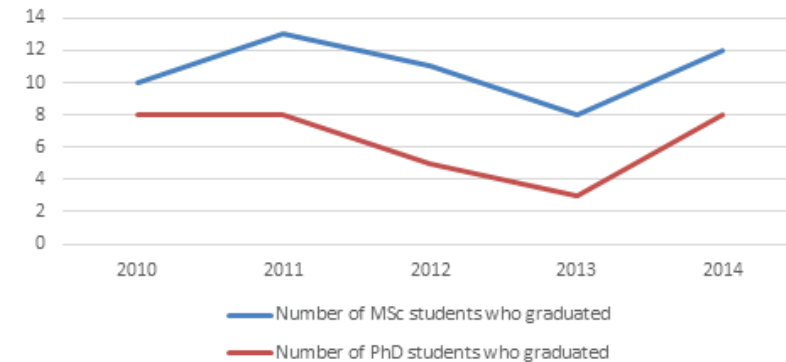
[Read more](#)



Number of postgraduate students 2010-2014



Number of PhD & MSc students who graduated 2010-2014



Our postgraduate students had a particularly good year, with 17 presentations and posters at three international and four local conferences. PhD student Ms Ntombizikhona B Ndlovu also visited the Frank Laboratory for Neutron Physics at the Joint Institute for Nuclear Research in Russia for her research on using nuclear physics techniques to provide data on air pollution levels.

## Awards

Twelve staff members received recognition from Stellenbosch University for excellent performance when they were awarded the SU Rector's Performance Award for 2014. They are C April, SH February, JN Kriel, GJ Louwrens, Prof. KK Müller-Nedebock, Dr PH Neethling, Prof. P Papka, H Randall, Prof. EG Rohwer, Dr CM Steenkamp, JJ van Zyl en Prof. H Weigel.

Our postgraduate students walked away with nearly all the major awards in photonics at the annual conference of the South African Institute for Physics:



|                  |                                                                                       |
|------------------|---------------------------------------------------------------------------------------|
| Mr L Makathini   | Best oral presentation by a PhD student in Nuclear Physics                            |
| Mr L Maweza      | Best technology development by PhD student                                            |
| Ms M McLaren     | Best poster & publication by PhD student in Photonics                                 |
| Ms I Minda       | Best oral presentation by a MSc student in Photonics                                  |
| Mr D Naidoo      | Best oral presentation by a PhD student in Photonics                                  |
| Mr D Spangenberg | Best oral presentation & publication by PhD student in Photonics                      |
| Mr J van Zyl     | Best oral presentation by a doctoral student in theoretical and computational physics |

## Other awards

|               |                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Mr H Fourie   | Most outstanding research in the radiation dosimetry field for his oral presentation, 52nd SA Association for Physicists in Medicine (SAAPMB) congress, South Africa |
| Ms A Suleiman | First Prize, SPIE Winter College on Optics at the International Centre for Theoretical Physics (ICTP), Italy                                                         |

## Meiring Naudé medal

The Meiring Naudé medal for the top student in physics was awarded to Mr Zander Lee. The medal is awarded annually to the top student who obtained at least 80% in his or her BSc Honours programme as well as an average of at least 60% for each module in the programme. Mr Lee was also the recipient of the Dean's award for 2014 for continuous excellent performance. The solid silver medal is awarded annually to a BSc Honours student who scores the highest average percentage throughout both the BSc and the BSc Honours programmes.





# DEPARTMENT OF PHYSIOLOGICAL SCIENCES

AT THE DEPARTMENT OF PHYSIOLOGICAL SCIENCES WE INVESTIGATE AND DEVELOP INNOVATIVE SOLUTIONS TO HEALTH ISSUES THAT POSE A SERIOUS CHALLENGE TO SOCIETY. WE FOLLOW AN INTEGRATIVE APPROACH THAT SPANS ALL LEVELS OF ORGANISATION, FROM THE MOLECULE TO THE WHOLE ORGANISM.

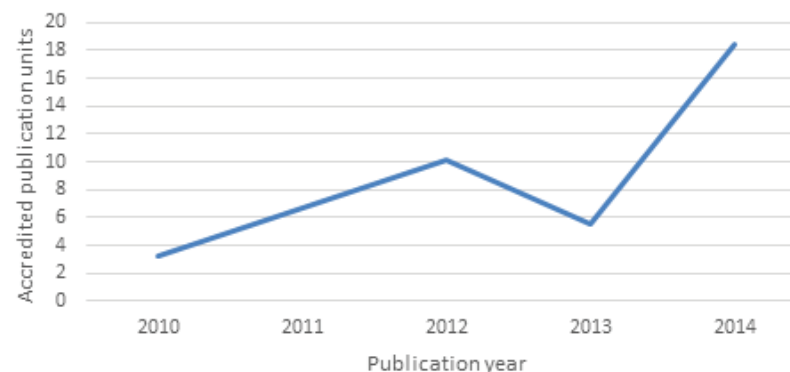
## Research interests



## Research output

During 2014 the Department reached an all-time high with 27 research articles published in accredited journals. This is nearly double our research output from 2012 and is the result of a strategic realignment of research activities and groupings.

Accredited publication units per publication year  
2010-2014



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## NRF-rated researchers

Five of our eight academic staff members are rated by the National Research Foundation:

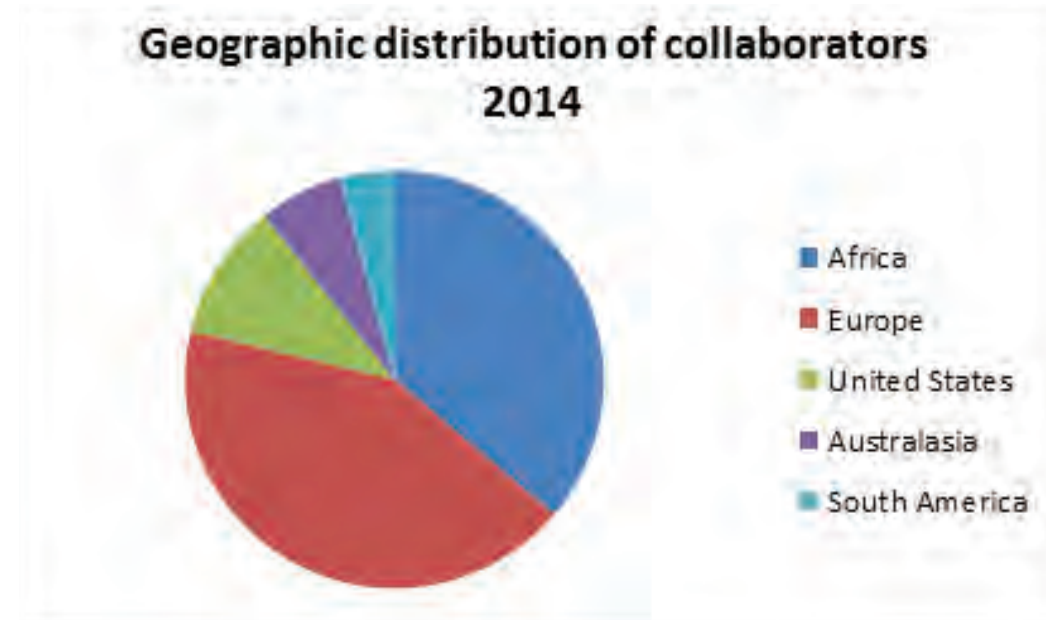
| Internationally acclaimed researcher |                           |
|--------------------------------------|---------------------------|
| Prof. Kathy Myburgh                  | skeletal muscle biology   |
| Established researcher               |                           |
| Prof. Faadiel Essop                  | cardiac metabolism        |
| Prof. Carine Smith                   | stress biology            |
| Prof. Anna-Mart Engelbrecht          | cell-death and signalling |
| Promising young researcher           |                           |
| Dr Ben Loos                          | neuro-disease signalling  |

## Collaboration

Researchers collaborated with 47 institutions from 21 different countries. Our strongest international collaborations are with researchers and institutions in the United Kingdom and the United States and with multinational companies such as Janssen Research and Development and Pfizer. We also increased our footprint in Africa, working with institutions in Zimbabwe, Botswana and Nigeria.

Other significant collaborations include Prof. Faadiel Essop's appointment as a visiting professor at the University of La Réunion (France) and his election as a member of the Council of the South African Society for Cardiovascular Research. Dr Ben Loos visited Prof. Hiromi Imamuri at the Hakubi Center for Advanced Research and Graduate School of Biostudies at Kyoto University (Japan) and Prof Esther Wong at Nanyang Technological University (Singapore).

Click on the map for a comprehensive list of our collaborators worldwide.



## Service to the scientific community

|                       |                                                                                                                                                                                                                                                                                                               |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Faadiel Essop   | Physiological Society of Southern Africa (president); Cardiovascular Section of the American Physiological Society (fellow); International Committee of the American Physiological Society (elected member); African Association of Physiological Sciences (elected council member)                           |
| Prof. A-M Engelbrecht | South African Society for Cardiovascular Research (executive committee); Muscle Biology Center, Kentucky University, USA (associate member)                                                                                                                                                                   |
| Prof. KH Myburgh      | Euro-Mediterranean Institute for Science and Technology (associate and division leader); Institute of Human Performance, Rehabilitation and Technology at the Centre for Research and Technology (CERETETH), Greece (external mentor)                                                                         |
| Dr Ben Loos           | South African National Committee of the International Union of Physiological Sciences - SANC-IUPS (capacity building delegate); Physiology Society of Southern Africa (treasurer and secretary); Microscopy Society of Southern Africa annual conference proceedings 2014 (conference convenor and co-editor) |
| Dr Theo Nell          | NRF DAAD/PhD/MSc Panels Member; SU Research Ethics Board Member                                                                                                                                                                                                                                               |

## Conferences and workshops

|                             |                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Faadiel Essop         | Experimental Biology 2014, Symposium on cardiac diseases (chair); South African Hearth Association annual congress (plenary speaker)                                                                                                                                                                                                                      |
| Prof. Anna-Mart Engelbrecht | 20 <sup>th</sup> International congress on Cell Death in Diseases (organiser)                                                                                                                                                                                                                                                                             |
| Dr Ben Loos                 | Microscopy techniques: Cell and Developmental Biology Symposium (presenter); 20 <sup>th</sup> International Congress on Cell Death in Diseases (keynote speaker); Key Stone Symposia – Autophagy: Fundamentals to Disease (presenter)                                                                                                                     |
| Prof. KH Myburgh            | Hellenic Society for Biochemistry and Exercise Physiology (keynote speaker); Cell and Developmental Biology Symposium (presenter); South African Society for Biochemistry and Molecular Biology Conference (invited speaker); American College of Sports Medicine (poster); Advances in Skeletal Muscle Biology in Health and Disease Conference (poster) |
| Dr Theo Nell                | 2014 Experimental Biology Conference (poster presentation)                                                                                                                                                                                                                                                                                                |
| Dr Bali Sishi               | 20th annual ICDS conference on Cell Death and Diseases (invited speaker); 42nd Physiological Society of Southern Africa; 22nd European Cell Death Organisation (ECDO) Euroconference on Apoptosis (poster presentation)                                                                                                                                   |

## Editorial activities

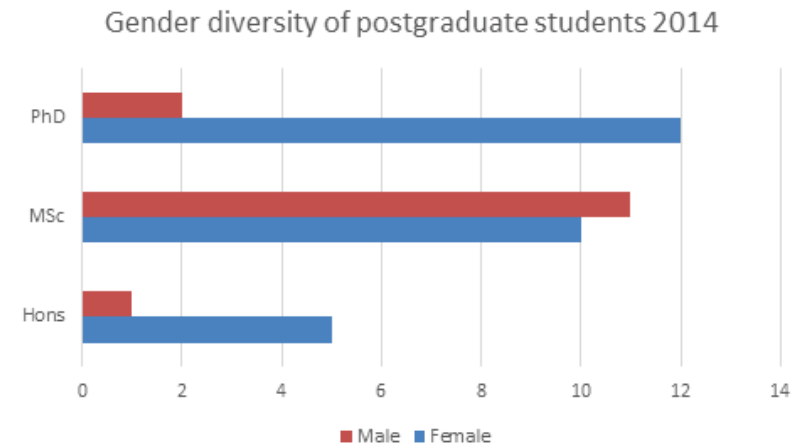
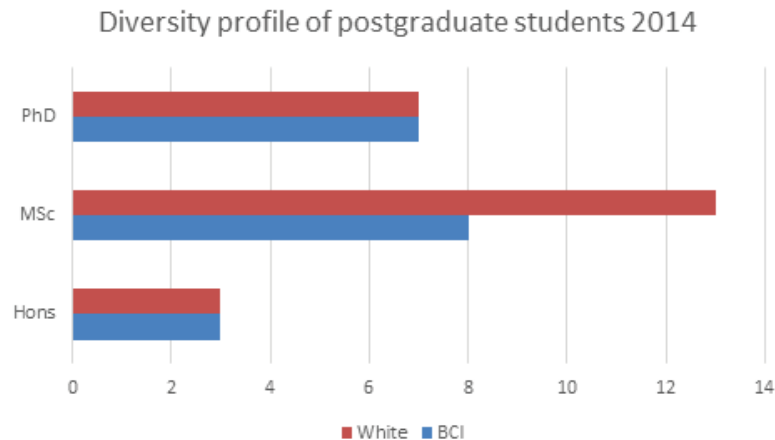
|                       |                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Prof. Faadiel Essop   | <i>Journal of African Association of Physiological Sciences</i> (editorial board); <i>International Journal of Clinical and Experimental Physiology</i> (editorial board); <i>PLoS One journal</i> (academic editor); <i>American Journal of Physiology Heart and Circulatory Physiology</i> (editorial board); <i>Advanced Biomedical Research</i> (editorial board) |
| Prof. A-M Engelbrecht | <i>International Journal of Biomedical Sciences</i> (editorial board)                                                                                                                                                                                                                                                                                                 |
| Prof. KH Myburgh      | <i>Biomed Central Physiology</i> (section editor); <i>Medicine and Science in Sports and Exercise</i> (editorial board); <i>Inflammopharmacology</i> (editorial board)                                                                                                                                                                                                |
| Prof. Carine Smith    | <i>Inflammopharmacology</i> (editorial board)                                                                                                                                                                                                                                                                                                                         |

## Awards

Prof. Kathy Myburgh was one of seven researchers in the Faculty of Science who has been honoured with the title Distinguished Professor by Stellenbosch University.

## Focus on postgraduate students and postdocs

The Department has 41 full-time postgraduate students on Honours (6), MSc (21) and PhD (14) level and we are doing well in terms of our diversity profile – 40% of our postgraduate students are from designated groups (Black, Coloured and Indian) and 55% are female. During 2014 we hosted three postdoctoral students from South Africa, Zimbabwe and Ireland.



Our postgraduate students also performed well at several national and international conferences:

|                      |                                                                                                           |
|----------------------|-----------------------------------------------------------------------------------------------------------|
| Ms Liz Louw          | Best Microscopy Images award, annual congress of the Microscopy Society of South Africa                   |
| Mr Yigael Powrie     | Award for most promising upcoming microscopist, annual congress of the Microscopy Society of South Africa |
| Ms Toni Goldswain    | Second place for best oral presentation, 20th annual ICDS conference on Cell Death and Diseases           |
| Ms Natasha Driescher | Best poster, annual congress of the Physiology Society of Southern Africa                                 |
| Ms Caleigh Opperman  | Second place for best oral presentation, annual congress of the Physiology Society of Southern Africa     |
| Ms Megan Mitchell    | Third place for best oral presentation, annual congress of the Physiology Society of Southern Africa      |



UNIVERSITEIT  
STELLENBOSCH  
UNIVERSITY

# Faculty of Science Fakulteit Natuurwetenskappe

Thank you / Dankie / Enkosi

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## BIOCHEMISTRY / BIOCHEMIE

## Journal articles (subsidised) / Tydskrifartikels (gesubsidieer)

**AFRICANDER D, STORBECK K-H, HAPGOOD JP.** A comparative study of the androgenic properties of progesterone and the progestins, medroxyprogesterone acetate (MPA) and norethisterone acetate (NET-A). *Journal of Steroid Biochemistry and Molecular Biology* 2014; **143** : 404-415.

**BURGER H-M, LOMBARD MJ, SHEPHARD GS, DANSTER-CHRISTIANS N, GELDERBLUM WCA.** Development and Evaluation of a Sensitive Mycotoxin Risk Assessment Model (MYCORAM). *Toxicological Sciences* 2014; **141**(2) : 387-397.

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**DE VILLIERS M, BARNARD L, KOEKEMOER L, SNOEP JL, STRAUSS E.** Variation in pantothenate kinase type determines the pantothenamide mode of action and impacts on coenzyme A salvage biosynthesis. *FEBS Journal* 2014; **281** : 4731-4753.

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**GUSTAVSSON A-K, VAN NIEKERK DD, ADIELS CB, GOKSÖR M, SNOEP JL.**

Heterogeneity of glycolytic oscillatory behaviour in individual yeast cells. *FEBS Letters* 2014; **588** : 3-7.

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Allosteric regulation of phosphofructokinase controls the emergence of glycolytic oscillations in isolated yeast cells. *FEBS Journal* 2014; **281**: 2784-2793.

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**KÜHN S, HOFMEYR J-HS.** Is the “Histone Code” an Organic Code? *Biosemitotics* 2014; **7**(2) : 203- 222.

**LEADLEY P, PROENÇA V, FERNÁNDEZ-MANJARRÉS J, PEREIRA HM, ALKEMADE R, BIGGS R, BRULEY E, CHEUNG W, COOPER D, FIGUEIREDO J, GILMAN E, GUÉNETTE S, HURTT G, MBOW C, OBERDORFF T, REVENGA C, SCHARLEMANN JPW, SCHOLES RJ, SMITH MS, SUMAILA RU, WALPOLE M.** Interacting Regional-Scale Regime Shifts for Biodiversity and Ecosystem Services. *Bioscience* 2014; **64**(8) : 665-679.

**LEUSSA AN-N, RAUTENBACH M.** Detailed SAR and PCA of the Tyrocidines and Analogues Towards Leucocin A-Sensitive and Leucocin A-Resistant *Listeria monocytogenes*. *Chemical Biology & Drug Design* 2014; **84** : 543-557.

**LOOS B, DU TOIT A, HOFMEYR J-HS.** Defining and measuring autophagosome flux – concept and reality. *Autophagy* 2014; **10**(11) : 2087-2096.

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**MOOLMAN WJA, DE VILLIERS M, STRAUSS E.** Recent advances in targeting coenzyme A biosynthesis and utilization for antimicrobial drug development. *Biochemical Society Transactions* 2014; **42**(4) : 1080-1086.

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**SCHLOMS L, SMITH C, STORBECK K-H, MARNEWICK JL, SWART P, SWART AC.** Rooibos influences glucocorticoid levels and steroid ratios in vivo and in vitro: A natural approach in the management of stress and metabolic disorders?. *Molecular Nutrition & Food Research* 2014; **58** : 537-549.

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**SPRY C, SALIBA KJ, STRAUSS E.** A miniaturized assay for measuring small molecule phosphorylation in the presence of complex matrices. *Analytical Biochemistry* 2014; **451** : 76-78.

**TROSKIE AM, DE BEER A, VOSLOO JA, JACOBS K, RAUTENBACH M.** Inhibition of agronomically relevant fungal phytopathogens by tyrocidines, cyclic antimicrobial peptides isolated from *Bacillus aneurinolyticus*. *Microbiology* 2014; **160** : 2089-2101.

**TROSKIE AM, RAUTENBACH M, DELATTIN N, VOSLOO JA, DATHE M, CAMMUE BPA, THEVISSSEN K.** Synergistic Activity of the Tyrocidines, Antimicrobial Cyclodecapeptides from *Bacillus aneurinolyticus*, with Amphotericin B and Caspofungin against *Candida albicans* Biofilms. *Antimicrobial Agents and Chemotherapy* 2014; **58**(7) : 3697-3707.

**VAN WYK P, VAN DYK JB, GERBER WJ, STANDER MA, DE VILLIERS AJ, KOCH KR.** Speciation of  $[\text{Pt}^{\text{IV}}\text{Cl}_{6-n}\text{Br}_n]^{2-}$  ( $n = 0-6$ ) and some of their mono-aquated  $[\text{Pt}^{\text{IV}}\text{Cl}_{5-n}\text{Br}_n(\text{H}_2\text{O})]^-$  ( $n = 0-5$ ) anions in solution at low concentrations by means of ion-pairing reversed-phase ultra-high-performance liquid chromatography coupled to electrospray ionization quadrupole time-of-flight mass spectrometry. *Rapid Communications in Mass Spectrometry* 2014; **28** : 505-519.

**VERHOOG N, ALLIE-REID F, VAN DEN BERGHE W, SMITH C, HAEGEMAN G, HAPGOOD JP, LOUW A.** Inhibition of Corticosteroid-Binding Globulin Gene Expression by Glucocorticoids Involves C/EBPβ. *PLoS ONE* 2014; **9**(10) : e110702.

**WILLEMSE CM, STANDER MA, TREDoux AGJ, DE VILLIERS AJ.** Comprehensive two-dimensional liquid chromatographic analysis of anthocyanins. *Journal of Chromatography A* 2014; **1359** : 189-201.

**WRIGHT LP, ROHWER JM, GHIRARDO A, HAMMERBACHER A, ORTIZ-ALCAIDE M, RAGUSCHKE B, SCHNITZLER J-P, GERSHENZON J, PHILLIPS MA.** Deoxyxylulose 5-Phosphate Synthase Controls Flux through the Methylerythritol 4-Phosphate Pathway in *Arabidopsis*<sup>1</sup>. *Plant Physiology* 2014; **165** : 1488-1504.

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**PAUL S, MÜLLER HP, PREISER R, DE LIMA NETO FB, MARWALA T, DE WILDE P.** Developing a management decision-making model based upon a complexity perspective with reference to the Bee Algorithm. *Emergence: complexity and organization* 2014; **16**(1) : 1-12.

**PREISER R, STRUTHERS P, MOHAMED S, CAMERON NA, LAWRENCE E.** External stakeholders and health promoting schools: complexity and practice in South Africa. *Health Education* 2014; **114**(4) : 260-270.

**TIPTON K, ARMSTRONG R, BAKKER BM, BAIROCH A, CORNISH-BOWDEN A, HALLING PJ, HOFMEYR J-HS, LEYHTS, KETTNER C, RAUSHEL FM, ROHWER JM, SCHOMBURG D, STEINBECK C.** Standards for Reporting Enzyme Data: The STRENDa Consortium: What it aims to do and why it should be helpful. *Perspectives in Science* 2014; **1** : 131-137.

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**LOOS B, HOFMEYR JS, MÜLLER-NEDEBOCK KK, BOONZAAIER L, KINNEAR CJ.** Autophagic Flux, Fusion Dynamics and Cell Death. In *Autophagy: Cancer, Other Pathologies, Inflammation, Immunity, Infection and Aging*, Volume 3, Elsevier, USA, 2014: 39-56.

**ROHWER JM, UYS L.** Systems Biology and Metabolic Modeling. In *SUGERCANE Physiology, Biochemistry and Functional Biology*, John Wiley & Sons, Inc. 2014: 601-622.

**ROHWER JM.** Applications of Kinetic Modeling to Plant Metabolism. In *Plant Metabolism Methods and protocols*, Springer Science+Business Media, New York, 2014: 275-286.

### Patents / Patente

**RAUTENBACH M, DE BEER A, TROSKIE AM, VOSLOO JA.** Antimicrobial cyclic peptide compositions for plants. Patent No. WO 2013/150394 A1, 2014.

### Doctoral completed / Doktoraal afgehandel

**LEUSSA AN-N.** Characterisation of small cyclic peptides with antilisterial and antimalarial activity. PhD(Bioch), 2014. 295 pp. Promotor: Rautenbach M.

**MACUAMULE C.** Coenzyme A biosynthesis and utilization in *Plasmodium falciparum*: drug targets for antimalarial chemotherapy. PhD(Bioch), 2014. 178 pp. Promotor: Strauss E. Co-promoter: Saliba KJ.

**TROSKIE AM.** Tyrocidines, cyclic decapeptides produced by soil bacilli, as potent inhibitors of fungal pathogens. PhD(Bioch), 2014. 215 pp. Promotor: Rautenbach M.

**VISSER JAK.** Phytoestrogenic extracts of *Cyclopia* modulate molecular targets involved in the prevention and treatment of breast cancer. PhD(Bioch), 2014. 253 pp. Promotor: Louw A.

### Masters completed / Magister afgehandel

**FOX C-L.** An investigation into the catalytic activity of porcine cytochrome P450 17 $\alpha$ -hydroxylase/17,20-lyase. MSc Biochemistry, 2014. 126 pp. Study leader: Swart AC. Co-study leader: Swart P, Storbeck K-H.

**HAYWARD S.** Partial characterization of a bacterial acyl-transferase enzyme for potential application in dairy processing. MSc Biochemistry, 2014. 129 pp. Study leader: Swart P.

**KÜHN S.** Organic codes and their identification: Is the histone code a true organic code?. MSc Biochemistry, 2014. 97 pp. Study leader: Hofmeyr J-HS.

**MORTIMER M.** Isolation and identification of compounds conferring phytoestrogenic activity to *Cyclopia* extracts. MSc Biochemistry, 2014. 310 pp. Study leader: Louw A. Co-study leader: Joubert E.

**VAN NIEKERK C.** Investigating self-fabrication in the context of artificial chemistries. MSc Biochemistry, 2014. 160 pp. Study leader: Hofmeyr J-HS.

**VAN STADEN CT.** Towards a kinetic model of the Entner-Doudoroff Pathway in *Zymomonas mobilis*. MSc Biochemistry, 2014. 84 pp. Study leader: Rohwer JM. Co-study leader: Snoep JL.

## BOTANY AND ZOOLOGY / PLANT- EN DIERKUNDE

### Journal articles (subsidised) / Tydskrifartikels (gesubsidieer)

**ASTON PHILANDER LE, MAKUNGA NP, ESLER KJ.** The Informal Trade of Medicinal Plants by Rastafari Bush Doctors in the Western Cape of South Africa. *Economic Botany* 2014; **68**(3) : 303- 315.

**ALEXANDER ME, DICK JT, WEYL OLF, ROBINSON TB, RICHARDSON DM.** Existing and emerging high impact invasive species are characterized by higher functional responses than natives. *Biology Letters* 2014; **10** : 20130946.

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**ANDREOTTI S, RUTZEN M, WESCHE PL, O'CONNELL CP, MEYER MA, OOSTHUIZEN H, MATTHEE CA.** A novel categorisation system to organise a large photo identification database for white sharks *Carcharodon carcharias*. *African Journal of Marine Science* 2014; **36**(1) : 59-67.

**APINDA-LEGNUOU E, SAMWAYS MJ, SIMAIKA JP.** Value of artificial ponds for aquatic beetle and bug conservation in the Cape Floristic Region biodiversity hotspot. *Aquatic Conservation-Marine and Freshwater Ecosystems* 2014; **24** : 522-535.

**AYLWARD J, DREYER LL, STEENKAMP ET, WINGFIELD MJ, ROETS F.** Development of polymorphic microsatellite markers for the genetic characterisation of *Knoxdaviesia proteae* (Ascomycota: Microascales) using ISSR-PCR and pyrosequencing. *Mycological Progress* 2014; **13** : 439-444.

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**BARRIOS-O'NEILL D, DICK JT, EMMERSON MC, RICCIARDI A, MACISAAC HJ, ALEXANDER ME, BOVY HC.** Fortune favours the bold: a higher predator reduces the impact of a native but not an invasive intermediate predator. *Journal of Animal Ecology* 2014; **83**(3) : 693-701.

**BEDNAREK-OCHYRA H, GREMMEN NJM, SMITH VR.** New national and regional bryophyte records, 39. *Journal of Bryology* 2014; **36**(2) : 134-151.

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**BEST PB, SMALE M, GLASS J, HERIAN K, VON DER HEYDEN S.** Identification of stomach contents from a Shepherd's beaked whale *Tasmacetus shepherdi* stranded on Tristan da Cunha, South Atlantic. *Journal of the Marine Biological Association of the United Kingdom* 2014; **94**(6) : 1093-1097.

**BLACKBURN TM, ESSL F, EVANS THOMAS, HULME PE, JESCHKE JM, KÜHN I, KUMSCHICK S, MARKOVÁ S, MRUGAIA A, NENTWIG W, PERGL J, PYŠEK P, RABITSCH W, RICCIARDI A, RICHARDSON DM, SENDEK A, VILÀ M, WILSON JRU, WINTER M, GENOVESI P, BACHER C.** A Unified Classification of Alien Species Based on the Magnitude of their Environmental Impacts. *PloS Biology* 2014; **12**(5) : e1001850.

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| Department of Biochemistry           |                      |                                                                                            |
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| Internationally acclaimed researcher | Prof Johann Rohwer   | systems biology                                                                            |
|                                      | Prof Jacky Snoep     | systems biology                                                                            |
|                                      | Prof Erick Strausss  | mechanistic enzymology and inhibitor development                                           |
|                                      | Prof Pieter Swart    | adrenal steroidogenesis, affinity separation and protein immobilisation                    |
| Established researcher               | Prof Dirk Bellstedt  | molecular systematics and immunology                                                       |
|                                      | Prof Ann Louw        | steroid receptors, bioactivity of honeybush                                                |
|                                      | Prof Amanda Swart    | bioactivity of rooibos and <i>Sutherlandia frutescens</i>                                  |
| Department of Botany and Zoology     |                      |                                                                                            |
| Leading international researcher     | Prof Dave Richardson | biological invasions and conservation biogeography                                         |
|                                      | Prof Terry Robinson  | evolutionary genetics and phylogenomics of mammals                                         |
| Internationally acclaimed researcher | Prof Conrad Matthee  | molecular systematics and phylogeography                                                   |
|                                      | Prof Guy Midgley     | Global Change Biology                                                                      |
|                                      | Prof Valdon Smith    | Antarctic and Southern Island biology and ecology                                          |
|                                      | Prof Michael Cherry  | behaviour ecology                                                                          |
|                                      | Prof Bruce Anderson  | plant-animal interaction                                                                   |
| Established researcher               | Dr Savel Daniels     | molecular systematics, phylogeography and conservation of invertebrata                     |
|                                      | Prof Leanne Dreyer   | evolution of Cape Flora                                                                    |
|                                      | Prof LeFras Mouton   | evolutionary ecology of lizards                                                            |
| NRF Prestigious Awardee              | Prof Alex Valentine  | molecular physiology of host-microbe interactions of legumes in phosphorus deficient soils |

|                                   |                             |                                                                      |
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|                                   | Prof Allan Ellis            | evolutionary ecology of plants and insects                           |
|                                   | Dr Jaco Le Roux             | evolutionary biology and ecology of plant invaders                   |
|                                   | Dr Nox Makunga              | medicinal plant biotechnology                                        |
|                                   | Prof Anton Pauw             | evolutionary ecology of plants and their pollinators                 |
|                                   | Dr Carol Simon              | marine invertebrate reproduction and polychaete worm taxonomy        |
|                                   | Dr Sophie von der Heyden    | marine molecular ecology and conservation                            |

### Department of Chemistry and Polymer Science

|                                             |                           |                                                                              |
|---------------------------------------------|---------------------------|------------------------------------------------------------------------------|
| <b>Leading international researcher</b>     | Prof Bert Klumperman      | living radical polymerization and advanced macromolecular architectures      |
|                                             | Prof Len Barbour          | functional nanostructured materials                                          |
| <b>Internationally acclaimed researcher</b> | Prof Ben Burger           | chemical communication in living organisms                                   |
|                                             | Prof Harald Pasch         | analytical polymer science, multidimensional chromatography                  |
|                                             | Prof Willem van Otterlo   | organic synthesis and medicinal chemistry                                    |
|                                             | Prof Helgard Raubenheimer | ligand design aimed at applications in homogeneous catalysis; gold chemistry |
|                                             | Prof Klaus Koch           | multinuclear NMR spectroscopy and platinum group metals chemistry            |

|                                   |                            |                                                                                 |
|-----------------------------------|----------------------------|---------------------------------------------------------------------------------|
| <b>Established researcher</b>     | Prof Peter Mallon          | complex polymer materials and polymer nano-composites                           |
|                                   | Prof Delia Haynes          | crystal engineering, chemistry of main group elements                           |
|                                   | Prof Selwyn Mapolie        | homogeneous catalysis via dendrimeric complexes                                 |
|                                   | Prof Catharine Esterhuysen | intermolecular interactions                                                     |
|                                   | Prof Ivan Green            | small molecules syntheses for medicinal application                             |
|                                   | Prof Ed Jacobs             | membrane and process development                                                |
|                                   | Prof Albert van Reenen     | structure-property relationships                                                |
|                                   | Prof Robbie Luckay         | ligand design for metal ion coordination in industrial and medical applications |
| <b>Promising Young Researcher</b> | Prof André de Villiers     | separation science fundamentals and applications                                |
|                                   | Dr Gareth Arnott           | inherently chiral calixarenes; asymmetric methodology                           |
|                                   | Dr Stephan Pelly           | medicinal chemistry                                                             |

### Department of Earth Sciences

|                                             |                     |                                                               |
|---------------------------------------------|---------------------|---------------------------------------------------------------|
| <b>Internationally acclaimed researcher</b> | Prof IS Buick       | metamorphic petrology, geochronology and isotope geochemistry |
|                                             | Prof JD Clemens     | granite petrogenesis                                          |
|                                             | Prof A Kisters      | structural geology                                            |
|                                             | Prof G Stevens      | experimental petrology                                        |
| <b>Established researcher</b>               | Dr S Fietz          | marine biogeochemistry                                        |
|                                             | Prof A Roychoudhury | environmental geochemistry and hydrology                      |

### Department of Mathematical Sciences

|                                         |                       |                                                         |
|-----------------------------------------|-----------------------|---------------------------------------------------------|
| <b>Leading international researcher</b> | Prof Helmut Prodinger | analysis of algorithms, number theory and combinatorics |
|-----------------------------------------|-----------------------|---------------------------------------------------------|

|                                             |                          |                                                                       |
|---------------------------------------------|--------------------------|-----------------------------------------------------------------------|
| <b>Internationally acclaimed researcher</b> | Prof Ben Herbst          | computer vision and machine learning                                  |
|                                             | Prof Leon van Wyk        | ring theory and matrix algebras                                       |
|                                             | Prof Stephan Wagner      | Graph theory and combinatorics                                        |
|                                             | Prof Willem Visser       | software failure, software engineering and software development       |
|                                             | Prof André Weideman      | numerical analysis and scientific computation                         |
| <b>Established researcher</b>               | Prof MK Banda            | numeral methods for vlow and transport processes                      |
|                                             | Prof Florian Breuer      | number theory                                                         |
|                                             | Prof Bernd Fischer       | software engineering                                                  |
|                                             | Dr Jaco Geldenhuys       | software engineering, specifically model checking and process algebra |
|                                             | Prof Sonja Mouton        | banach algebras and spectral theory                                   |
|                                             | Dr Farai Nyabadza        | mathematical biology                                                  |
|                                             | Prof Ingrid Rewitzky     | mathematics of computer science                                       |
|                                             | Prof Brink van der Merwe | automata theory                                                       |
|                                             | Prof Lynette van Zijl    | theoretical computer science and asisstive technologies               |
| <b>Promising young researcher</b>           | Dr Karin-Therese Howell  | algebra                                                               |
|                                             | Dr Zurab Janelidze       | category theory and universal algebra                                 |
|                                             | Dr Gareth Boxall         | model theory, logic                                                   |
| <b>NRF Prestigious Awardee</b>              | Prof Cang Hui            | invasion biology, mathematical ecology                                |

### Department of Microbiology

|                                             |                       |                                                                                      |
|---------------------------------------------|-----------------------|--------------------------------------------------------------------------------------|
| <b>Internationally acclaimed researcher</b> | Prof Eugene Cloete    | water biotechnology                                                                  |
|                                             | Prof Leon Dicks       | lactic acid bacteria, probiotics and bacteriocins                                    |
|                                             | Prof Emile van Zyl    | bioethanol from plant material and expression of foreign proteins in yeast and fungi |
| <b>Established researcher</b>               | Prof Marinda Bloom    | fungal bioprocessing                                                                 |
|                                             | Prof Karin Jacobs     | microbial ecology                                                                    |
|                                             | Dr Heinrich Volschenk | bioprospecting for enzymes and expression of foreign proteins in yeast               |
| <b>Promising young researcher</b>           | Prof Alf Botha        | yeast and fungal ecology                                                             |

## Department of Physiological Sciences

### Internationally acclaimed researcher

Prof Kathy Myburgh

skeletal muscle biology

### Established researcher

Prof Faadiel Essop

cardiac metabolism

## Department of Physics

### Internationally acclaimed researcher

Prof Anthony Cowley

nuclear physics

Prof HB Geyer

theoretical physics

Prof Dieter Heiss

theoretical physics

Prof Michael Kastner

theoretical physics

Prof FG Scholtz

theoretical physics

Prof HPH Schwoerer

laser physics

Prof H Touchette

theoretical physics

Prof H Weigel

theoretical physics

### Established researcher

Prof EG Rohwer

laser physics

Dr F Cinti

theoretical physics

Prof HC Eggers

theoretical physics

Prof RT Newman

nuclear physics

Prof SM Wyngaard

nuclear physics

Prof BIS van der Ventel

nuclear physics

Dr CM Steenkamp

laser physics

Dr JJ van Zyl

nuclear physics

### Promising young researcher

Prof P Papka

nuclear physics

Dr PH Neethling

laser physics



FACULTY OF SCIENCE / FAKULTEIT NATUURWETENSKAPPE  
STAFF / PERSONEEL  
2014

DEPARTMENT OF BIOCHEMISTRY

**ACADEMIC STAFF**

Dr DJ Africander  
Prof DU Bellstedt  
Dr A Botes  
Prof J-HS Hofmeyr  
Prof A Louw  
Prof M Rautenbach  
Prof JM Rohwer  
Prof JL Snoep  
Dr K Storbeck  
Prof E Strauss  
Prof AC Swart  
Prof P Swart                      Head of department  
Dr DD van Niekerk

**EXTRAORDINARY  
PROFESSOR**

Prof WCA Gelderbloem

**SUPPORT STAFF**

Ms WW Maart                      Secretary  
Mr AP Arends  
Mr KD Botha  
Mr R Brandt  
Mrs H Bredell  
Mrs CA de Villiers  
Mrs L du Toit  
Dr Y Engelbrecht  
Mrs AP Februarie  
Mrs GD Gerstner  
Mr CR Jansen  
Mrs C Langeveldt  
Ms RP Louw  
Dr MA Stander

**POSTDOCS**

Dr L Bloem  
Dr R Domingo  
Dr J Eicher  
Dr L Koekemoer  
Dr R Louw-du Toit  
Dr T Magcwabeba  
Dr AM Troskie  
Dr JC Visser  
Dr GA Wells

**RESEARCH  
ASSOCIATES  
NEW  
APPOINTMENTS**

Dr MD Pirie

Dr M de Villiers

RCA fellow/Researcher

**DEPARTMENT OF BOTANY AND ZOOLOGY**

**ACADEMIC STAFF**

Prof Conrad Matthee

Prof BC Anderson

Prof MI Cherry

Dr S Clusella-Trullas

Prof SR Daniels

Prof LL Dreyer

Prof AG Ellis

Dr AF Flemming

Dr JJ Le Roux

Prof NP Makunga

Prof G Midgley

Prof PLN Mouton

Dr MI Mouton

Prof Anton Pauw

Dr RV Rambau

Prof DM Richardson

Prof TJ Robinson

Dr TB Robinson

Dr CA Simon

Prof VR Smith

Prof AJ Valentine

Prof JH Van Wyk

Dr S Von der Heyden

Prof T Wossler

Executive head

Associate professor (promoted)

Professor (promoted)

Professor (promoted)

Associate professor (promoted)

Senior lecturer (promoted)

Senior Professor (promoted)

**CENTRE OF  
EXCELLENCE FOR  
INVASION BIOLOGY**

Prof DM Richardson

Dr Cang Hui

Dr John Measey

Prof Brian van Wilgen

(director since May 2012)

(until March 2014)

(since April 2014)

(since April 2014)

**EXTRAORDINARY  
PROFESSORS**

Prof AM Bauer

Prof S Barrett

Prof SL Chown

Prof KJ Gaston

Prof MA McGeoch

Prof L Mumba

Prof KJ Tolley

Prof B van Wilgen

Prof JR Wilson

**SUPPORT STAFF**

Ms S Jacobs

principal secretary

Ms J Basson  
Mr A Fransman  
Ms F Gordon  
Ms RM Honing  
Ms S Johnson  
Ms DJD Julies  
Dr A Kleinert  
Ms J Law-Brown  
Mr R Robertson  
MP Sauerman  
Mr M Siebritz  
Mr N Solomons  
Mr RC Thompson  
Mr JP Williams  
Mr H Witbooi

**CENTRE OF  
EXCELLENCE FOR  
INVASION BIOLOGY**

K Coombe-Davis  
S Davies  
D du Plessis  
Dr M Gaertner  
A Garthwaite  
M Koordom  
S Kritzinger-Klopper  
E Marais  
C Momberg  
R Moses  
E Nortje  
C Scheepers  
M van der Vyver

**POSTDOCS**

Dr Mhairi Alexander  
Dr Marinus de Jager  
Dr Nina dU TOIT  
Dr Shelley Edwards  
Dr Romina Henriques  
Dr Heidi Hirsch  
Dr Christian Kelstrup  
Dr Michael Logan  
Dr Matthew Mc Connachie  
Dr Natasha Mothapo  
Dr Ana Novoa Perez  
Dr Ethel Phiri  
Dr JG Rodger  
Dr Adelle Roux  
Dr Gary Stafford  
Dr Vernon Visser

**RETIRED**

Prof Valdon Smith

## DEPARTMENT OF CHEMISTRY AND POLYMER SCIENCE

### ACADEMIC

Prof PE Mallon                      Departmental head  
Dr GE Arnott  
Prof LJ Barbour  
Dr MAL Blackie  
Dr L Cronje  
Prof AJ de Villiers  
Dr K de Villiers  
Prof JLM Dillen  
Prof C Esterhuysen  
Dr WJ Gerber  
Ms A Gericke  
Dr DA Haynes  
Prof EP Jacobs  
Prof L Klumperman  
Prof KR Koch  
Dr T le Roex  
Dr M le Roux  
Dr RC Luckay  
Dr M Lutz  
Dr R Malgas-Enus  
Prof SF Mapolie  
Prof H Pasch  
Dr SC Pelly  
Dr L Retief  
Dr I Rootman-le Grange  
Prof WAL van Otterlo  
Prof AJ van Reenen  
Dr PFM Verhoeven

### SENIOR RESEARCHER

Dr R Pfukwa

### RCA FELLOWS

Dr NP Gule  
Dr VJ Smith  
Dr AGJ Tredoux

### EXTRAORDINARY PROFESSORS

Prof WM Mackenroth  
Prof A Rowan

### RESEARCH ASSOCIATE

Prof IR Green  
Dr AE Smit

### EMERITUS PROFESSORS

Prof BV Burger  
Prof HG Raubenheimer

### SUPPORT STAFF

Mr JG Goldie                      Departmental manager  
Ms LD Bailey  
Mr M Bickerstaff  
Ms MMG Cooper  
Ms DM Davids

Ms M du Plessis  
Ms AE Fourie  
Ms C Hendrickse  
Ms DM Isaacs  
Ms MC Johnson  
Mr RD Lawrence  
Mr CW Maart  
Mr MG Marupula  
Ms SG May  
Ms CJ van Reenen  
Mr A van Zaal  
Ms DC Wenn  
Mr GR Willemse

#### **TECHNICAL STAFF**

Mr WJ Adonis  
Mr MC de Jongh  
Mr JD Groenewald  
Mr DJ Koen  
Mr EJ Lukhele  
Mr MA McLean  
Mr S Mohamed  
Mr JS Motshweni  
Dr NO Pretorius  
Mr J Smit  
Ms PJ Steyn

#### **NEW APPOINTMENTS**

Mr EJ Lukhele  
Ms C Hendrickse

### **DEPARTMENT OF EARTH SCIENCES**

#### **ACADEMIC**

Prof IS Buick  
Prof JD Clemens  
Dr S Fietz  
Dr R Heyn  
Prof A Kisters  
Dr M Klausen  
Dr J Miller  
Prof A Roychoudhury      Departmental chair  
Prof A Rozendaal  
Prof G Stevens  
Dr R Tucker

#### **EXTRAORDINARY PROFESSORS**

Dr I Basson  
Prof D Frei  
Prof A Gerdes

#### **SUPPORT STAFF**

Ms L Conradie  
G Olivier  
F Timney



**NEW APPOINTMENTS**

Dr R Tucker

**RETIRED**

Prof A Rozendaal

**DEPARTMENT OF MATHEMATICAL SCIENCES  
(MATHEMATICS, APPLIED MATHEMATICS, COMPUTER SCIENCE)****ACADEMIC STAFF**

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| Prof IM Rewitzky      | Professor and Executive head: Mathematical Sciences        |
| Prof MK Banda         | Professor                                                  |
| Dr B Bartlett         | Lecturer                                                   |
| Mr W Bester           | Junior Lecturer                                            |
| Dr G Boxall           | Lecturer                                                   |
| Prof F Breuer         | Professor and Head: Mathematics division                   |
| Dr WH Brink           | Senior Lecturer                                            |
| Dr J Brink            | Senior Lecturer                                            |
| Ms EJ Burger          | Junior Lecturer                                            |
| Dr J Coetzer          | Senior Lecturer                                            |
| Dr H de Villiers      | Lecturer                                                   |
| Dr GH Diedericks      | Senior Lecturer                                            |
| Dr S Fidler-Woudberg  | Senior Lecturer                                            |
| Prof B Fischer        | Professor of Computer Science                              |
| Prof A Fransman       | Associate Professor                                        |
| Prof J Geldenhuys     | Associate Professor                                        |
| Mr I Govender         | Lecturer                                                   |
| Dr J Gray             | Lecturer                                                   |
| Prof BW Green         | Professor seconded to AIMS-SA                              |
| Dr PJP Grobler        | Senior Lecturer                                            |
| Ms HA Haroldt         | Lecturer                                                   |
| Prof BM Herbst        | Professor of Applied Mathematics                           |
| Dr K-T Howell         | Senior Lecturer                                            |
| Prof Cang Hui         | Research Chair                                             |
| Dr CP Inggs           | Senior Lecturer                                            |
| Prof Z Janelidze      | Associate Professor                                        |
| Dr AP Keet            | Senior Lecturer                                            |
| Dr RS Kroon           | Senior Lecturer                                            |
| Dr MF Maritz          | Senior Lecturer                                            |
| Prof S Mouton         | Associate Professor                                        |
| Dr MA Muller          | Senior Lecturer                                            |
| Dr NL Muller          | Senior Lecturer                                            |
| Dr CG Naude           | Senior Lecturer                                            |
| Prof F Nyabadza       | Associate Professor                                        |
| Dr PJP Ouwehand       | Senior Lecturer                                            |
| Prof H Prodinger      | Professor of Mathematics                                   |
| Dr NL Ralaivaosaona   | Lecturer                                                   |
| Dr R Roux             | Lecturer                                                   |
| Prof GJF Smit         | Associate Professor and Head: Applied Mathematics Division |
| Mr JP Swanepoel       | Junior Lecturer                                            |
| Prof AB van der Merwe | Associate Professor                                        |
| Dr S van der Walt     | Senior Lecturer                                            |

|  |                 |                                                                      |
|--|-----------------|----------------------------------------------------------------------|
|  | Prof L van Wyk  | Professor of Mathematics                                             |
|  | Prof L van Zijl | Professor of Computer Science and Head:<br>Computer Science Division |
|  | Prof W Visser   | Professor of Computer Science                                        |
|  | Prof S Wagner   | Professor of Mathematics                                             |
|  | Ms L Wessels    | Lecturer                                                             |
|  | Prof M Wild     | Professor of Mathematics                                             |

#### EXTRAORDINARY PROFESSORS

|                     |                       |
|---------------------|-----------------------|
| Prof JM de Villiers | Mathematics           |
| Prof MB Dwyer       | Computer Science      |
| Prof T Krzesinski   | Computer Science      |
| Prof HE Porst       | Mathematics           |
| Prof JW Sanders     | Mathematical Sciences |

#### EXTRAORDINARY ASSOCIATE PROFESSOR

|                  |                       |
|------------------|-----------------------|
| Prof K Scheffler | Computer Science      |
| Prof A Welte     | Mathematical Sciences |

#### SUPPORT STAFF

|                   |                       |
|-------------------|-----------------------|
| Mrs HA du Plessis | Computer Science      |
| Ms L Adams        | Mathematics           |
| Ms W Isaacs       | Mathematics           |
| Mr B Jacobs       | Mathematics           |
| Mrs OM Marais     | Mathematics           |
| MS Rabie          | Mathematical Sciences |
| Mrs MM Rhoda      | Applied Mathematics   |
| Mr AL Roman       | Applied Mathematics   |
| Mr D Stephanus    | Computer Science      |
| Mrs M van Niekerk | Applied Mathematics   |
| Dr N Hale         | Applied Mathematics   |

#### POSTDOCS

#### RETIRED ACADEMICS

|              |                 |
|--------------|-----------------|
| Dr MA Muller | Senior Lecturer |
|--------------|-----------------|

#### NEW APPOINTMENTS

|            |                 |
|------------|-----------------|
| Dr J Brink | Senior Lecturer |
| Dr R Roux  | Lecturer        |

#### RESIGNATIONS

|                |                                  |
|----------------|----------------------------------|
| M Banda        | Professor of Applied Mathematics |
| S van der Walt | Senior Lecturer                  |

### DEPARTMENT OF MICROBIOLOGY

#### ACADEMIC STAFF

|                    |                                                                                        |
|--------------------|----------------------------------------------------------------------------------------|
| Prof Marinda Bloom |                                                                                        |
| Prof A Botha       |                                                                                        |
| Prof TE Cloete     | Vice-rector: research and innovation                                                   |
| Prof LM Dicks      | Distinguished Professor                                                                |
| Prof K Jacobs      |                                                                                        |
| T Jansen           |                                                                                        |
| Dr W Khan          |                                                                                        |
| Prof DE Rawlings   |                                                                                        |
| Prof WH Van Zyl    | Departmental chair, Distinguished Professor<br>Biofuels Research Chair                 |
| Dr H Volschenk     |                                                                                        |
| Prof GM Wolfaardt  | Director, Stellenbosch University Water Institute and<br>ERWAT Chair in Water Research |

## EXTRAORDINARY PROFESSORS

Prof Axcell  
Prof L Lynd  
Prof BA Prior  
Prof J Thevelein  
Prof D Toerien

## SUPPORT STAFF

J Daniels  
LJ Daniels  
J de Kock  
M Gey van Pittius  
MH Koopman  
M Stuurman  
T van der Merwe  
L van der Westhuizen  
W Wentzel

## DEPARTMENT OF PHYSICS

## ACADEMIC STAFF

|                         |                |
|-------------------------|----------------|
| Prof EG Rohwer          | Executive head |
| Dr L Boonzaaier         |                |
| Dr GW Bosman            |                |
| Dr A du Plessis         |                |
| Prof HC Eggers          |                |
| Mr D Geduld             |                |
| Prof HB Geyer           |                |
| Dr H Kriel              |                |
| Prof KK Müller-Nedebock |                |
| Prof PH Neethling       |                |
| Prof RT Newman          |                |
| Prof P Papka            |                |
| Prof FG Scholtz         |                |
| Prof HPH Schwoerer      |                |
| Dr JA Stander           |                |
| Dr CM Steenkamp         |                |
| Prof BIS van der Ventel |                |
| Dr JJ van Zyl           |                |
| Prof H Weigel           |                |
| Prof SM Wyngaardt       |                |

## EXTRAORDINARY PROFESSORS

Prof AA Cowley  
Prof CA Dominguez  
Prof A Forbes  
Prof WD Heiss  
Prof J Meng  
Prof T Parker  
Prof H Stafast  
Prof Z Vilakazi  
Prof HM von Bergmann

## PROFESSORS EMERITUS

Prof PR de Kock  
Prof PE Walters

|                        |                                                                                                                 |
|------------------------|-----------------------------------------------------------------------------------------------------------------|
| <b>SUPPORT STAFF</b>   | Ms C April<br>Mr DP Pool<br>Ms H Randall<br>Ms C Ruperti                                                        |
| <b>TECHNICAL STAFF</b> | Mr MC Botha<br>Mr J Burns<br>Mr SH February<br>Mr JM Germishuizen<br>Mr GJ Louwrens<br>MR DP Pool<br>EJ Shields |

## DEPARTMENT OF PHYSIOLOGICAL SCIENCES

|                        |                                                                                                                                          |                    |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| <b>ACADEMIC STAFF</b>  | Prof MF Essop<br>Prof A-M Engelbrecht<br>Dr B Loos<br>Prof KH Myburgh<br>Dr T Nell<br>Dr B Sishi<br>Prof C Smith<br>Dr JA de Wet Strauss | Departmental chair |
| <b>SUPPORT STAFF</b>   | Mr J Isaacs<br>Ms S Martins<br>Ms GA Simon                                                                                               |                    |
| <b>TECHNICAL STAFF</b> | Mr A Isaacs<br>Dr A Krygsman<br>Dr L Lacerda                                                                                             |                    |
| <b>POSTDOCS</b>        | Dr A Brand<br>Dr P Durcan<br>Dr D Joseph<br>Dr M Kruger<br>Dr R Mapanga                                                                  |                    |