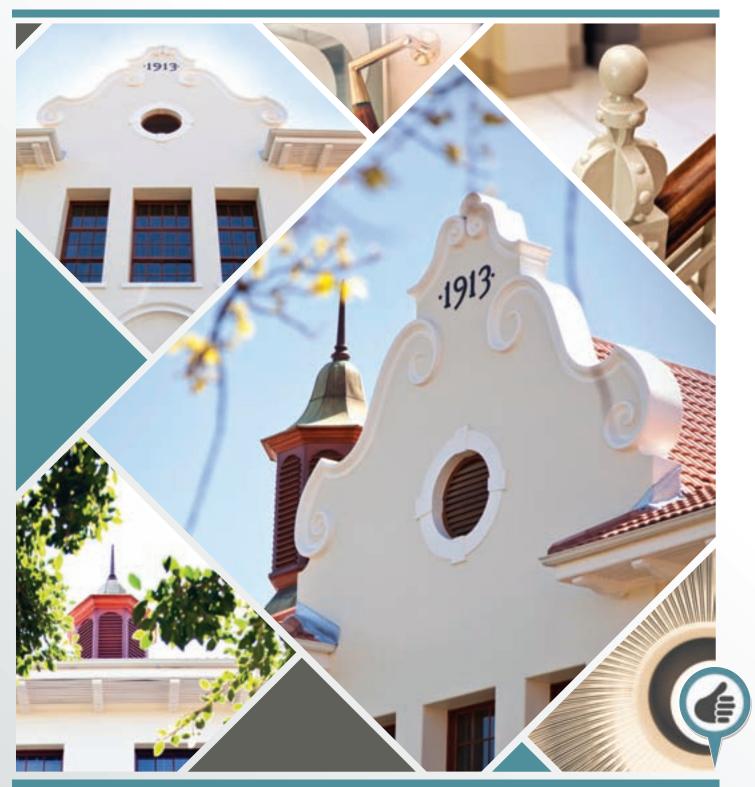


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2013

FAKULTEIT **NATUURWETENSKAPPE** JAARVERSLAG FACULTY OF **SCIENCE** ANNUAL REPORT





FAKULTEIT **NATUURWETENSKAPPE** JAARVERSLAG FACULTY OF **SCIENCE** ANNUAL REPORT

KONTAKINLIGTING CONTACT DETAIL

DEKAAN | DEAN

Prof Doug Rawlings (waarnemend/acting) t 021 808 3071 e der@sun.ac.za

DEKAAN SE KANTOOR | OFFICE OF THE DEAN

Suzette Els t 021 808 3072 e se@sun.ac.za

DIREKTEUR: FAKULTEITSBESTUUR | DIRECTOR: FACULTY MANAGEMENT

Mariétta van den Worm t 021 808 3760 e mvdworm@sun.ac.za

AKADEMIESE KOÖRDINEERDER | ACADEMIC COORDINATOR

Wilma Wagener t 021 808 3063 e ww@sun.ac.za

FAKULTEITSEKRETARIS | FACULTY OFFICER

Bevin Abels t 021 808 4832 f 021 808 3822 e bpa@sun.ac.za

MEDIA EN KOMMUNIKASIE | MEDIA AND COMMUNICATION

Wiida Fourie-Basson

t 021 808 2684 e science@sun.ac.za

Comari Schoeman

t 021 808 2684 e science2@sun.ac.za

REKENAARGEBRUIKSAREAS (NARGA) | COMPUTER USERS AREA

t 021 808 2682 e narga@sun.ac.za

Fisiese adres: Physical address:	2de vloer, Al Peroldgebou, Stellenbosch kampus 2nd Floor, Al Perold Building, Stellenbosch campus
Posadres:	Fakulteit Natuurwetenskappe, Universiteit Stellenbosch Privaat Sak XI, MATIELAND, 7602
Postal address:	Science Faculty, Stellenbosch University Private Bag X I , MATIELAND, 7602
Faks Fax:	(021) 808 3680
Webblad Website	www.sun.ac.za/science

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s **Cover photo**s

Feature photos

Die opgeknapte Wiskundige Wetenskappe en Bedryfsielkunde Gebou het in 2013 'n honderd jaar oud geword. **Foto's: Rousseau fine art photography** The newly-renovated Mathematical Sciences and Industrial Psychology Building turned a hundred years old in 2013. Photos: Rousseau fine art photography

Glansfoto's

Met spesiale dank aan **prof. J.D. Clemens** vir die glansfoto's van die geboue waarin die Fakulteit Natuurwetenskappe se verskeie departemente gehuisves word. A special thank you to **Prof J.D. Clemens** for the feature images of some of the buildings housing the Faculty of Science's various departments.

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Prof Doug Rawlings

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In line with Stellenbosch University's Vision 2030 and the National Development Plan (NDP), the Faculty of Science is committed to positioning the University as a research-focused academic institution of excellence and a respected knowledge partner. Indeed, it is in the area of quality research outputs that the Faculty contributes towards building the scientific, technological and intellectual capacity of Africa and is playing an active role in South Africa's development.

Report from the **Dean's office**

During 2013 the Faculty of Science reached a record with 100 of its staff holding current NRF ratings. The number of publication subsidy units based on the audited figures for 2012 similarly reached an all-time high of 248.81 units (2011: 238.97 units). The faculty produced a significant number of PhDs, with 50 students graduating in 2013.

An important strategic objective is to ensure high levels of undergraduate and postgraduate student success rates, while adapting to various challenges to achieve this. These include the different education backgrounds of a diverse student body and integrating new teaching and learning methods.

To ensure the undergraduate success rate, we established initiatives such as differentiated tutor support (to cater for struggling and outstanding students), parallel-medium instruction and interpreting services. Other initiatives, such as the increased integration of ICT into teaching and learning, were facilitated through a Teaching and Learning Forum established by the vice-dean, Prof Ingrid Rewitzky, in 2012.

It is a significant challenge to ensure the success of especially those students from poor schooling backgrounds at the undergraduate level. In order to recruit more students from the small pool of historically disadvantaged applicants with suitable school-leaving results, we increased the number of recruitment bursaries from 50 to 150 in 2013. While the overall percentage of black, coloured and Indian undergraduates is currently 32%, the diversity target for 2018 is 40.6%.

The Faculty of Science employs excellent academics, many of whom enjoy national and international acclaim in their fields of expertise. Over 90% of the permanent academic staff members have a doctoral degree. However, our staff diversity profile remains a challenge. Presently 17,4% of the 155 academic staff members represent races other than white. Taking all staff in the Faculty into account, this becomes 33,8%. A major challenge is the scarcity of suitable candidates in many of the scientific disciplines, especially computer science and earth sciences.

The Faculty endeavours to make a substantial contribution to the NDP's vision to increase the number of PhD graduates from the current 28 to 100 per million per year by 2030. We have set a new target of 60 PhDs per annum. To achieve this requires a sufficiently large pipeline and throughput, from BScHons through MSc to PhD. To this end, a bursary scheme was implemented to enable deserving students to continue with their studies. There is an early completion incentive in

place for PhD students who complete their studies in three years. At the postgraduate level, the number of historically disadvantaged students has increased from 33,4% in 2008 to 40,2% in 2013.

In 2013, the Faculty instituted a new incentive to reward academics on publication in the top 10% to 20% of international journals within an ISI-recognised publication category.

Two leading scientists recognised internationally in the field of nanostructure materials and polymer sciences, have received the highest accolades from the South African Chemical Institute. Prof Bert Klumperman was awarded the Gold Medal for his exceptional contributions to the field, while Prof Len Barbour was awarded the SASOL Chemistry Innovator (SACI) of the Year Medal. Prof Erick Strauss and two postgraduate students, Helene Wahl and Nicola Steyn, also received SACI medals.

Prof Dave Richardson, director of the DST-NRF Centre of Excellence for Invasion Biology, received the Havenga Prize for Life Sciences from the *Suid-Afrikaanse Akademie vir Wetenskap en Kuns.* Four researchers were recognised by SU for their outstanding research publication output: Prof André de Villiers, Prof Helmut Prodinger, Prof Terry Robinson and Prof Stephan Wagner:

Several of our researchers featured in 200 Young South Africans, an annual authoritative supplement of the Mail & Guardian. They are Dr Nonjabule Gule, Prof Florian Breuer, Dr Balindiwe Sishi and Ms Dorette du Plessis.

Measures taken to expand our knowledge base include the filling of the SARChI Chair in Epidemiological Modelling and Analysis by Prof Jackie Snoep and the appointment of Prof Cang Hui to the Research Chair in Mathematical and Theoretical Physical Biosciences. Prof Gideon Wolfaart will return to South Africa from Canada in 2014 to take up the ERWAT Chair in Wastewater Management, sponsored by the East Rand Water Care Company.

The Faculty is committed to promoting science and technology among the youth through involvement with the Eskom International Science Fair, the SU Science and Mathematics Weeks, the South African Mathematics Foundation's learner development project and various outreach activities.

The Faculty of Science has a strong research ethos and is well-positioned to deliver quality outputs in 2014.

Prof Doug Rawlings Dean: Faculty of Science, Stellenbosch University (Acting)

DEPARTMENT OF EARTH SCIENCES



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Contact details

Tel 021 808 3219 Fax 021 808 3129 E-mail lcon@sun.ac.za Web www.sun.ac.za/earthSci

Research interests

Tectonics and orogenic processes; petroleum geology; petrogenesis of granitic rocks; metamorphic petrology; trace-element and isotope geochemistry; experimental petrology; shear-zone hosted gold deposits; massive sulphide deposits; heavy mineral placer deposits; metallogenesis of mobile belts; marine geochemistry and hydro-geochemistry and pollution.

Research highlights

It was a busy year, with publication in high-profile journals and the various laboratories (geochemistry and experimental petrology) being used to capacity, in support of honours, MSc and PhD research by our students.

During 2013 the first Trace and Experimental Biogeochemistry Clean Lab in Africa (situated at Stellenbosch University) became operational. The R2.2 million laboratory was funded by SU and the Department of Science and Technology through the CSIR's Southern Ocean Carbon-Climate Observatory (SOCCO) programme and took three years to complete. With this world-class facility now up and running, researchers and students are able to participate in long term international observational programmes such as GEOTRACES, which aims to improve the understanding of biogeochemical cycles and large-scale

which aims to im

to: Wiida Fourie-Bassoi

The research team from Stellenbosch University (SU) and the CSIR are finally ready to start operating from the first 'Trace and Experimental Biogeochemistry Clean Lab' in Africa at SU. From the left, **Prof Alakendra Roychoudhury**, a geochemist and head of the Department of Earth Sciences at SU, MSc student **Ms Natasha van Horsten**, the CSIR's **Dr Thato Mtshali**, who specialises in ironbiogeochemistry, and SU's biogeochemist **Dr Susanne Fietz**. distribution of trace elements and their isotopes in all the major ocean basins over the next decade. The facility is part of an integrated research infrastructure development strategy, which also includes new analytical equipment and ultra-clean container labs for ocean sampling in the new research ship SA Agulhas II, managed by the Department of Environmental Affairs.

Dr Susanne Fietz and two postgraduate students, Ms Natasha van Horsten and Mr Raimund Rentel, accompanied the SA Agulhas II for the three-month return voyage to Antarctica. They worked with the CSIR's Dr Thato Mtshali to sample iron from the Southern Ocean in order to study its role in the photosynthesis of phytoplankton. This will shed light on how the Southern Ocean is taking up carbon dioxide from the atmosphere.

Agreements facilitating joint MSc and PhD degrees were established with the Federal University of Ouro Preto in Brazil and the University of Jean-

Monnet, St Etienne, France. The first student to graduate with a joint degree in 2014 will be Mr Gautier Nicoli from the University of Jean-Monnet.

Academic affairs

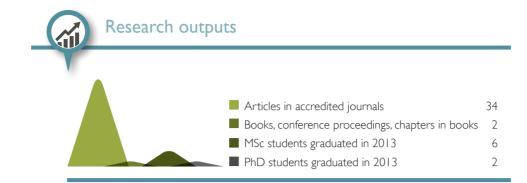
This year we had an honours cohort of 30 students, which is impressive in the context of our small staff complement. Feedback from external examiners suggests that we have the highest-quality honours class of any Earth Science or Geology department in the country.

We had 24 MSc and eight PhD students registered in the Department in 2013, as well as two postdoctoral fellows.

Service to the scientific community

Prof John Clemens chaired the Earth Sciences Ratings Panel of the National Research Foundation (NRF). On invitation of the NRF his three-year term has been extended and from 2014 he will serve as an ordinary panel member. Prof Clemens is the founding president of the Igneous and Metamorphic Studies Group (affiliated with the Geological Society of South Africa) and a member of the Post-NOMAD drilling programme steering committee.

Prof Alakendra Roychoudhury is an associate editor of the international journal *Applied Geochemistry*. He is also South Africa's representative and steering committee member of the international GEOTRACES program, member of the Council for the International Association of GeoChemistry (IAGC) and a founder member of the Africa Earth Observatory Network (AEON). Prof Roychoudhury is furthermore a board member



of the Marine Research Institute (MA-RE) at the University of Cape Town, a steering committee member of the Applied Centre for Climate and Earth Systems Science (ACCESS), and of the National Oceanographic Equipment and Planning Committee.

Prof Gary Stevens is a committee member of the Western Cape Regional Expensive Equipment Programme (REEP). He contributes in his position as Director of the Central Analytical Facility (CAF) at Stellenbosch University and, perhaps most importantly, as the SARChI Chair of Experimental Petrology, hosted within the Department of Earth Sciences, as part of the South African Research Chair Initiative (SARChI) Programme. He is a member of the editorial boards of *Lithos, Terra Nova* and the *Journal of Metamorphic Geology.*

Members of the academic staff regularly serve as reviewers of scientific papers, research proposals and rating applications (nationally and internationally). They also act as external examiners of MSc and PhD candidates. Prof Alex Kisters serves on the editorial board of the *South African Journal of Geology* and as a panel member of the NRF South African National Antarctic Programme (SANAP). Prof Ian Buick is a member of the editorial boards of

Lithos and Gondwana Research. Dr Jodie Miller continues to chair the Western Cape Branch of the Geological Society of South Africa (GSSA). Prof Dirk Frei is a permanent member of the European Science Foundation's pool of reviewers for research proposals.

Awards to staff and students

Prof John Clemens was elected to the Fellowship of the Royal Society of South Africa, and will be installed in 2014. A number of research grants were awarded to academic staff through the National Research Foundation and industries.

Staff matters

During 2013 we only had two changes to our staffing. Dr Daniel Mikeš resigned to take up position as Associate Professor in the Department of Geosciences at Nelson Mandela Metropolitan University. The Department welcomed the arrival of Dr Susanne Fietz to fill the previously vacant position as Senior Lecturer in Environmental Geochemistry.

Community service

The Department continues its involvement in assisting communities in the Tanqua Karoo. Also, many staff members regularly perform services to the South African and international scientific communities as reviewers of papers for major journals and of proposals to research foundations.



From the left, the CSIR's **Dr Thato Mtshali** with SU MSc student **Natasha van Horsten**, **Prof Alakendra Roychoudhury** and another MSc student, **Raimund Rente**l. Department of Earth Sciences



Prof John Clemens was elected to the Fellowship of the Royal Society of South Africa.

NRF-rated researchers

Internationally acclaimed researcher Prof John Clemens (granite petrogenesis) | Prof lan Buick (metamorphic petrology, geochemistry and isotope geochemistry) | Prof Gary Stevens (SARChI Chair of Experimental Petrology) | Prof Alex Kisters (structural geology and tectonics) Established researcher Prof Alakendra Roychoudhury (environmental geochemistry and hydrology)



Academic

Prof IS Buick Prof |D Clemens Dr S Fietz Dr R Heyn Prof A Kisters Dr M Klausen Dr | Miller Prof A Roychoudhury* Prof A Rozendaal Prof G Stevens**

Extraordinary

professors Dr I Basson Prof D Frei Prof A Gerdes Prof N Phillips Prof W Verwoerd

Support staff

L Conradie G Olivier FTimmey

* Departmental head ** SARChI Chair

Collaboration and Funding

COLLABORATION South Africa

Agricultural Research Council, Nietvoorbij Council for Geosciences Council for Scientific and Industrial Research (CSIR) iThemba Labs Rhodes University South African Nuclear Energy Corporation (NECSA) University of Cape Town (UCT) University of Pretoria (UP) University of the Western Cape (UWC) University of the Witwatersrand (Wits)

Africa

Geological Survey of Namibia University of Namibia

International General

Geotraces International (Australia, UK, USA)

Australia

Australian National University Curtin University of Technology James Cook University Monash University Museum Victoria University of Adelaide

Brazil

Federal University of Ouro Preto Canada

McGill University University of Ottawa

Denmark Geological Survey of Denmark and Greenland

Finland University of Helsinki

France

University Blaise-Pascal, Clermont-Ferrand University of Brest University of Paris VII University of Rennes University of St Etienne

Germany

Aachen University of Technology Freiburg University Memorial University University of Hamburg

India

University of Rajasthan Indian Institute of Technology Kharagpur

Ireland University College Dublin

Italy

University of Padova

Japan Shizuoka University

The Netherlands Delft University of Technology Rijks University of Groningen University of Utrecht

Sweden Linköping University

Switzerland University of Lausanne

United Kingdom Durham University Leeds University Liverpool University University of Edinburgh Newcastle University

United States of America

Colorado School of Mines Lehigh University Princeton University Woods Hole Oceanographic Institute

FUNDING

Anglo Base Metals AngloGold AngloGold Ashanti AngloPlatinum Australian Research Council BHP Billiton Chevron Texaco ConocoPhilips Council for Scientific and Industrial Research (CSIR) **European Union** ExxonMobil Geological Society of South Africa Government of Gabon Inkaba ye Africa Kumba Resources Namaqua Sands National Research Foundation (NRF) Schlumberger StatoilHydro TransHex Water Research Commission (WRC)

DEPARTMENT OF **BIOCHEMISTRY**

51

GIR

MIKROBICIO

Contact details

Tel 021 808 5862 Fax 021 808 5863 E-mail biochair@sun.ac.za Web www.sun.ac.za/biochem

Research interests

Antibiotics and membrane active peptides; application of bio-active peptides in agriculture; bioactivity of rooibos, honeybush and *Sutherlandia frutescens*; biocatalysis; computational and experimental systems biology; enzyme inhibitor development; malaria metabolism and antimalarial drugs; mechanistic modelling of health and epidemiology; mechanistic enzymology; membrane affinity separation; natural products; ostrich pathology and vaccine development; plant molecular systematics; potato virus systematics and detection; adrenal and prostate steroid hormone biosynthesis and metabolism; steroid receptors and binding proteins.

Research highlights

In his capacity as the new SARChI research chair in mechanistic modelling of health and epidemiology, Prof Jacky Snoep continued his research on a mechanistic understanding and mathematical modelling of whole body disease state during malaria and HIV infections, and diabetes type II development. In collaboration with the South African Centre for Epidemiological Modelling and Analysis (SACEMA) he works on the modelling of the global epidemiology of HIV.To enable him to perform this research a new laboratory, housing sophisticated computer and specialised fermentor facilities, was built in the department.

Dr Donita Africander attended the 2013 EMBO Conference on Nuclear Receptors: Linking molecules, genomes and physiology in Sorrento (Italy) and presented a poster on her research. EMBO is a European organisation of more than 1 500 leading researchers in the life sciences.

Prof Dirk Bellstedt presented a plenary lecture at the 39th Annual Conference of the South African Association of Botanists held in Drakensville, South Africa.

Prof Marina Rautenbach presented a plenary lecture at the 7th Gordon Research Conference on Antimicrobial Peptides held in Ventura, Los Angeles, in March 2013.

Prof Johann Rohwer gave lectures at the Metabolic Pathway Analysis conference which was held in Oxford (UK), and at the 6th Beilstein Symposium on Experimental Standard Conditions of Enzyme Characterisations (ESCEC) which was held in Rüdesheim (Germany).

He also gave a poster presentation on the programming language Python at the 6th European Conference on Science in Python (EuroScipy 2013), held in Brussels (Belgium).

Prof Jacky Snoep was an invited speaker at the Systems Biology Approach to Infectious Processes Conference in Lyon (France) and presented a workshop on mathematical modelling at the 14th International Conference on Systems Biology (ICSB) in Copenhagen (Denmark). He also gave an oral presentation at a meeting of the Computational Modelling in Biology Network (Combine) in Paris (France).

Dr Karl Storbeck attended the second conference on Steroid Research in Chicago (USA) and presented a poster on his research.

Prof Erick Strauss spent five months as a visiting researcher at the Department of Biochemistry at the University of Wisconsin-Madison

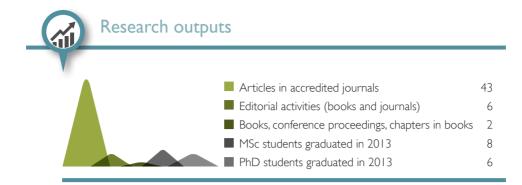
(USA). His host, Prof Doug Weibel, is an authority on the application of micro-flow equipment for the study of microbial physiology. During this period he attended the Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC 2013) in Denver, Colorado, where he presented a poster with one of his postdoctoral fellows.

Prof Pieter Swart gave a lecture at the 2nd International Congress on Steroid Research in Chicago (USA). He delivered a poster presentation at the 2nd International Conference on Pharma-Nutrition in Singapore (Malaysia). He also presented lectures at the 18th World Congress on Advances in Oncology & 16th International Symposium on Molecular Medicine in Hersonissos (Greece) and at the International Mohair Summit in Jansenville (South Africa).

Prof Amanda Swart presented a lecture on the application of Rooibos as a functional food in the management of metabolic disorders at the 2nd International Conference on Pharma-



Prof Jackie Snoep (far right) can now perform his research in a new laboratorium, housing sophisticated computer facilities and specialised fermentor facilities. Prof Snoep holds the SARChI research chair in mechanistic modelling of health and epidemiology.



Nutrition in Singapore (Malaysia). She presented a guest lecture on adrenal steroids and their role in prostate cancer at the Adrenal Seminar Series held by the Adrenal Research Group at the University of Michigan (USA). She was invited to present a lecture on her research on the metabolism of adrenal steroids in prostate cancer at the I8th World Congress on Advances in Oncology & I6th International Symposium on Molecular Medicine in Hersonissos (Greece).

Academic affairs

One of the Department of Biochemistry's strengths is its large number of postgraduate students: in 2013 the department enrolled 11 Honours students, 35 MSc students and 24 PhD students.

Service to the scientific community

Dr Donita Africander served as treasurer of the South African Society of Biochemistry and Molecular Biology. Prof Johann Rohwer was a member of the international Standards for Reporting Enzymology Data (STRENDA) Commission and served as an associate editor of *BioMedCentral Systems Biology*. He was also elected to the editorial board of *Frontiers in Plant Systems Biology*. He acted as evaluation panel member of the National Research Foundation for their "Competitive Programme for Rated Researchers (CPRR)" and "Competitive Support for Unrated Researchers (CSUR)".

Prof Jacky Snoep served as editor of the journals Federation of European Biochemical Society Journal (FEBSJ); Microbiology; IET Systems Biology; and Metabolomics.

Awards to staff and students

Prof Erick Strauss received a B3 rating from the NRF as an established researcher.

Prof Amanda Swart received an award for outstanding achievement for the paper she delivered at the 18th World Congress on Advances in Oncology & 16th International Symposium on Molecular Medicine in Greece. The title was *11B-Hydroxyandrostenedione is metabolised to novel androgenic C19 steroids in the prostate* and was sponsored by Spandidos Publications.

Staff matters

Dr Dawie van Niekerk was appointed as a lecturer on 1 June 2013.

Community interaction

Prof Marina Rautenbach served as a consultant for SABMiller, Rhodes Food Group, Diasorin and EcoFert. Dr Donita Africander, Prof Dirk Bellstedt, Mr Wiets Roos (PhD student) and Dr Karl Storbeck served as judges at the annual Stellenbosch regional of the Eskom Expo for Young Scientists.

NRF-rated researchers

Leading international researcher Prof Jannie Hofmeyr (systems biology and complexity studies)

Internationally acclaimed researcher Prof Johann Rohwer (systems biology) | Prof Jacky Snoep (systems biology) | Prof Erick Strauss (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 Sutherlandia frutescens)



Academic

Collaboration and Funding

COLLABORATION South Africa

Prof P Swart* Dr DJ Africander Prof DU Bellstedt Dr A Botes Prof |-HS Hofmeyr Prof A Louw Prof M Rautenbach Prof IM Rohwer Prof IL Snoep Dr K Storbeck Prof E Strauss Prof AC Swart Dr DD van Niekerk

Extraordinary

professor Prof WCA Gelderblom

Support staff

W Maart* AP Arends KD Botha R Brandt CA de Villiers L du Toit A Februarie 11 Foster GD Gerstner CR lansen C Langeveldt RP Louw Dr MA Stander

* Head of department ** Secretary

BBI Enzymes Council for Scientific and Industrial Research, Biosciences Diasorin EcoFert Elsenburg Agricultural College Grootfontein Agricultural Development Institute Institute of Pharmacology, University of Cape Town Medical School Klein Karoo Group Mohair South Africa North West University: Unit for Drug Research and Development Post-Harvest & Wine Technology Division, Agricultural Research Council, Infruitec-Nietvoorbij Potatoes South Africa Research Solutions Rhodes Food Group SARMiller South African Centre for Epidemiological Modelling and Analysis South African Rooibos Council SurePure University of Cape Town: Department of Chemistry; Department of Molecular and Cell Biology University of KwaZulu-Natal: School of Biochemistry, Genetics and Microbiology University of Pretoria: Department of Biochemistry University of the Western Cape: Department of Medical Bioscience University of the Witwatersrand: School of Chemical and Metallurgical Engineering International Australia Australian National University La Trobe University Belgium Catholic University of Leuven

Germany

Leibniz Institute of Molecular Pharmacology Max Planck Institute of Chemical Ecology Max Planck Institute of Molecular Plant Physiology Technical University of Dresden: Department of Biology University of Duisburg-Essen: Molecular

Enzymetechnology and Biochemistry

Hungary

University of Debrecen: Department of Inorganic and Analytical Chemistry,

Italy

Istituto Superiore di Sanità (ISS): Department of Food Safety and Veterinary Public Health Italian National Research Council (CNR): Institute of Protein Biochemistry

Netherlands

Vrije Universiteit Amsterdam

Spain

Universitat Autònoma de Barcelona

Sweden

University of Gothenburg

Switzerland University of Zürich

United Kingdom

Royal Botanic Garden Edinburgh University of Aberdeen University of Edinburgh University of Manchester

United States of America

- Northwestern University, Chicago: Department of Dermatology and Urology, Feinberg School of Medicine
- University of Michigan: Department of Molecular and Integrative Physiology; Department of Internal Medicine
- University of North Carolina-Chapel Hill: Department of Chemistry
- University of Wisconsin-Madison: Department of Chemistry and Biochemistry

FUNDING

BBI Enzymes Biopep Research Fund Cancer Association of South Africa Ernst Oppenheimer Fellowship Trust Fund German/South African Bilateral Fund Hungarian/South African Bilateral Fund Klein Karoo Group Medical Research Council Mohair South Africa National Research Foundation Potatoes South Africa Research Solutions SABMiller South African HIV/AIDS Research and Innovation Platform South African Malaria Initiative South African Rooibos Council Stellenbosch University SurePure Technology and Human Resources for Industry Programme (THRIP) Water Research Commission



Contact details

Tel 021 808 2971 Fax 021 808 4967 E-mail pemallon@sun.ac.za Web www.sun.ac.za/chemistry

Research interests

Synthetic methodology directed towards useful new compounds and materials (catalysts, polymers, other supramolecular frameworks with application potential, membranes and biologically active compounds); separation technology and advanced analysis (GC-MS, HPLC-MS, GPC, electroanalysis, NMR, polymer separation, AFM, ICP-MS, CRYSTAF and X-ray diffraction); modelling of molecular structure; platinum metals chemistry research in the context of refining and purification; medicinal chemistry.

Research highlights

Research productivity continued to grow in 2013, with 92 peer-reviewed papers appearing in accredited journals, as well as one book and one book-chapter. Moreover, 15 MSc and 17 PhD degrees based on research in chemistry and polymer science were awarded and Prof Len Barbour was awarded the degree of DSc for his contribution to research elucidating the nature of host-guest chemistry in crystalline solids.

Members of staff presented their work at important national and international conferences. Highlights include the following:

Prof Harald Pasch was invited to present keynote lectures at the Conference on Separation and Characterization of Natural and Synthetic Polymers (SCM-6) (Germany), the Du Pont Polymer Seminar (USA), and Braskem Scientific Colloquium (USA). He presented invited lectures at the eight Novolen Technology Conference (France), the International Conference on Ionic Polymerization (IP-2013) (Japan), and a pre-conference short course at the 26th International Symposium on Polymer Analysis and Characterization (ISPAC-2013) (USA).

Prof Klaus Koch was invited to present a keynote lecture at the 16th Inorganic Chemistry Conference (INORG2013) hosted by the South African Chemical Institute (SACI). He was also invited by Dr Liang Xian to the Chemical Engineering Institute at the Northwest University for Nationalities (Lanzhou, China), to present a lecture and to explore research

collaboration. The visit resulted in the hosting of Dr Xian on a postdoctoral fellowship in 2014. Prof Koch represented the Department and the Science Faculty at a workshop concerning the Stellenbosch and Bath University International Research Partnership Scheme. Several promising workshops and academic exchange meetings between members of staff of the universities have taken place, which will hopefully lead to profitable international collaboration in years to come.

Prof Catharine Esterhuysen participated in the 20th Conference on Horizons in Hydrogen Bond Research (Belgium) and was an invited speaker at INORG2013, along with Dr Katherine de Villiers and Prof Selwyn Mapolie. Prof Mapolie chaired a technical session on homogeneous catalysis at the National Conference of the Catalytic Society of South Africa (CATSA) (South Africa) and presented a talk at the biannual Conference on Inorganic Chemistry of the Royal Australian Chemical Institute (Australia). Dr Delia Haynes gave oral presentations at INORG2013

and the 21st International Conference on the Chemistry of the Organic Solid State (ICCOSSXXI) (UK), which was also attended by Dr Tanya le Roex.

Prof Peter Mallon attended the World Forum on Advanced Materials Conference (POLYCHAR 21) (South Korea) as an invited speaker and also attended the ROSAM Conference (France). Prof Mallon had a visiting student from the Marie and Pierre Curie University in Paris (UPMC) working in his lab for six months.

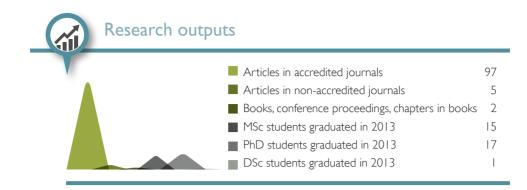
Dr Gareth Arnott gave a plenary lecture at the Binational Organic Chemistry Conference (Germany) while Prof Willem van Otterlo was invited to present a lecture at the SACI National Convention (South Africa).

Prof André de Villiers gave an invited keynote lecture at the 40th International Symposium on High Performance Liquid Chromatography and Related Techniques (Australia) and a lecture at the 39th International Symposium on High Performance Liquid Phase Separations and Related Techniques (HPLC 2013) (The Netherlands).

Several scientists visited the Department to collaborate with staff members and present



Prof Len Barbour (right) received a Doctor of Science degree (DSc) at Stellenbosch University's 2013 graduation ceremony. With him is his supervisor, **Prof Catharine Esterhuysen.**



seminars, including Prof Wolfgang Mackenroth, BASF (Germany) and Prof Carl Percival, University of Manchester (UK).

Awards to staff and students

Mr Adli Peck was awarded the 2013 Merck Best Final Year Student Award in chemistry, as well as the Element Six (Pty) Ltd DST/NRF Centre of Excellence medal for applied chemistry subjects. Ms Nicola Steyn was awarded the James Moir medal for the best BSc(Hons) student and Ms Helene Wahl (PhD student) was awarded the Sasol postgraduate medal for her outstanding research to date. Winner of the Best Poster Award

at the 40th International Symposium on High Performance Liquid Chromatography and Related Techniques (Australia), was Ms Martha Kalili.

Dr Rehana Malgas-Enus was selected to participate in the Andrew Mellon Foundation Early Researcher Career Programme after her appointment in January 2013. Prof André de Villiers was one of four Faculty of Science staff members and among the 39 SU staff members who were rewarded for excellent research by the Vice-rector: Research and Innovation. They had made the biggest contribution to SU's total number of accredited publications in 2011, the most



recent year for which audited publication figures were available at the time of adjudication

Prof Bert Klumperman received the 2013 SACI Gold Medal for outstanding research, and Prof Len Barbour won the SASOL Chemistry Innovator of the Year award. Prof Ed Jacobs received the National Excellence in Teaching and Learning Award 2013 for his efforts in teaching in the Extended Degree Programme (EDP).

Service to the scientific community

Staff members were involved in several national councils and organisations, particularly the South African Chemical Institute (SACI), the Society of Biological Inorganic Chemistry, the South African Crystallographic Society (SACryst), the South African Academy of Science and the Royal Society of South Arica.

Membership of international organisations included the Royal Society of Chemistry (UK), the American Chemical Society, the American Crystallographic Association, the Royal Dutch Chemical Society and the International Society for Biomedical Polymers and Polymeric Biomaterials.

Prof Selwyn Mapolie was re-elected as a member of the CATSA executive committee for a further two-year term. Prof Mapolie also served on several review panels, which included the NRF-equipment programme and the THRIP programme.

Prof André de Villiers was a member of the scientific committee of the 40th International Symposium on High Performance Liquid Chromatography and Related Techniques (Australia) and was also elected chair of the Western Cape Board of the Chromatographic Society of South Africa (ChromSA). Prof Catharine Esterhuysen was president of SACryst and Dr Margaret Blackie served as treasurer to the Western Cape Branch of SACI, Prof Every year the Department of Chemistry and Polymer Science recognises those students who excelled in their studies during the previous year, with several awards made to undergraduate, final year and postgraduate students.

From the left, **Prof Klaus Koch** (head of department), **Mr Adli Peck**, **Ms Tarryn Haickney, Prof Leslie Cornish** (University of the Witwatersrand), **Ms Tamara Fedderke** (Merck), **Mr Reinhardt Venter, Dr Ferdi de Lange** (SMM Instruments), **Prof Doug Rawlings** (acting dean, Faculty of Science) and **Ms Anna-Marie Lombard.** Peter Mallon as chair of the branch and Dr Robbie Luckay as secretary.

The local organisers of the 12th UNESCO School and International Conference on Macromolecules, presented in Stellenbosch, were Prof Harald Pasch (conference chair), Prof Albert van Reenen, Prof Peter Mallon and Prof Bert Klumperman. The fifth annual Polymer Science Winter School was held at the Polymer Science Division and was attended by 25 undergraduates from other universities. All costs were covered by research funds from within the Polymer Science Division. The organiser was Prof van Reenen, who also presented the course along with Prof Pasch, Prof Klumperman and Prof Mallon.

Prof Harald Pasch was elected head of the scientific board of the regular UNESCO/IUPAC Conferences on Macromolecules and Materials and also served on the international advisory committee of the International Symposium on Ionic Polymerization. He was a governing board member of the International Symposium on Polymer Analysis and Characterization (ISPAC) and member of the German Chemical Society (GDCh) and the South African Chemical Institute. He served as editorial board member of the International Journal on Polymer Analysis and Characterization (IJPAC) and as main editor of the Springer book series 'Springer Laboratory Manuals in Polymer Science' (Springer Publishers, Germany).

Community interaction

Dr Rehana Malgas-Enus and Prof Klaus Koch initiated the Stellenbosch University Chemistry Outreach Initiative (SUNCOI) in February 2013. The department aims to



ioto: Peta Stevr

Physical sciences teachers from the Cape Winelands district attended a practical training session at the Department in November 2013. Postgraduate students in chemistry, as well as some doing the Postgraduate Certificate in Education, volunteered in their black labcoats. assist disadvantaged high schools with their prescribed chemistry practicals by inviting teachers and learners to do their experimental work (assisted by postgraduate chemistry students) in one of the university's fully equipped laboratories at times when these are not utilised. Supported with discretionary funds from the Department and the Division of Community Interaction, the Department hosted grade 11 learners from three Stellenbosch high schools (Kylemore, Luckhoff and Cloetesville) for a practical on intermolecular forces.

A SUNCOI "Teaching the Teacher the Nuts and Bolts of Chemistry" project was launched with two physical science teacher training workshops (with a focus on chemistry) presented in collaboration with the Western Cape Education Department. Pleasingly, 92 teachers from many high schools in the Western Cape underwent training for Grade 12 chemistry practical work. The workshops were such a success that the experimental procedures have been

incorporated into the Western Cape Education Department CAPS exemplar handed to teachers by their subject advisors, and these have subsequently been rolled out to all the physical science teachers in the Western Cape.

Dr Malgas-Enus gave an oral presentation on the SUNCOI primary school project "Fun with chemistry" at the Stellenbosch University Schools Interaction Forum. The aim of the forum is to share information about existing projects, to share development plans for new projects, to explore synergies between existing projects, to explore opportunities to support existing or new projects and to provide input regarding SU's school partnership and development strategy.

Staff matters

Prof Klaus Koch's term as departmental head ended in December 2013. The new head, Prof Peter Mallon, will take over the reins in January 2014. Prof Albert van Reenen celebrated 25 years of employment in the Department of Chemistry and Polymer Science, and formerly in the Institute of Polymer Science. Dr Maggie Hurndall and Ms Jessie Joubert retired at the end of 2013 after sterling service at Stellenbosch University of more than 30 and 40 years respectively. Dr Delia Haynes was promoted to associate professor from 1 January 2014, Dr Willem Gerber to senior lecturer and Dr Lizl Cronje to lecturer.

NRF-rated researchers

Leading international researcher Prof Len Barbour (functional nanostructured materials) | Prof Bert Klumperman (living radical polymerization and advanced macromolecular architectures)

Internationally acclaimed researcher Prof Ben Burger (chemical communication in living organisms) | Prof Harald Pasch (analytical polymer science, multidimensional chromatography) | Prof Helgard Raubenheimer (ligand design aimed at applications in homogeneous catalysis; gold chemistry) | Prof Klaus Koch (platinum group metals) | Prof Willem van Otterlo (organic synthesis and medicinal chemistry)

Established researcher Prof Catharine Esterhuysen (intermolecular interactions) | Prof Ivan Green (small molecules syntheses for medicinal application) | Prof Ed Jacobs (membrane and process development) | Prof Peter Mallon (complex polymer materials and polymer nano-composites) | Prof Selwyn Mapolie (homogeneous catalysis via dendrimeric complexes) | Prof Albert van Reenen (polyolefins) | Dr Robbie Luckay (ligand design for metal ion coordination in industrial and medical applications)

Promising young researcher Prof André de Villiers (separation science fundamentals and applications) | Dr Delia Haynes (crystal engineering of non-metal containing materials) | Dr Gareth Arnott (inherently chiral calixarenes; asymmetric methodology) | Dr Stephen Pelly (medicinal chemistry – drug design and synthesis)



Academic

Staff

Prof KR Koch* Dr GE Arnott Prof L| Barbour Dr MAL Blackie Dr L Cronje Prof AJ de Villiers Dr K De Villiers Prof JLM Dillen Prof C Esterhuysen Dr WI Gerber A Gericke Dr DA Haynes Prof EP Jacobs Prof L Klumperman DrT le Roex Dr M le Roux Dr RC Luckay Dr M Lutz Dr R Malgas-Enus Prof PE Mallon Prof SF Mapolie Prof H Pasch Dr SC Pelly Prof WAL van Otterlo Prof AI van Reenen Dr PFM Verhoeven

* Departmental head

Extraordinary professors Prof W Hiller Prof WM Mackenroth Prof PIF Sandra

Research associate Prof IR Green

Prof A Rowan

Emeritus professors Prof BV Burger Prof HG Raubenheimer

Support staff

IG Goldie* WI Adonis LD Bailey M Bickerstaff MMG Cooper DM Davids MC de Jongh M du Plessis AF Fourie ID Groenewald Dr MI Hurndall D Isaacs MC Johnson JE Joubert DJ Koen RD Lawrence CW Maart MG Marupula SG May MA McLean S Mohamed IS Motshweni Dr R Pfukwa Dr NO Pretorius I Smit PJ Steyn MICTaylor CJ van Reenen A van Zaal DC Wenn **GR** Willemse

** Departmental manager

Collaboration and Funding

COLLABORATION South Africa

Cape Peninsula University of Technology (CPUT) Department of Science and Technology, South African Research Chair Initiative Programme (SARChI) Durban University of Technology (DUT) Nelson Mandela Metropolitan University (NMMU) University of Cape Town (UCT) University of Fort Hare University of Johannesburg (UJ) University of Johannesburg (UJ) University of Johannesburg (UJ) University of KwaZulu-Natal (UKZN) University of Pretoria (UP) University of the Western Cape (UWC) University of the Witwatersrand (Wits) University of South Africa (UNISA) Walter Sisulu University

International

Australia Monash University University of Western Australia

Austria Borealis Mondi

Belgium Katholieke Universiteit Leuven University of Ghent Vrije Universiteit Brussels

Canada University of Waterloo

Czech Republic Technical University of Liberec

France University of Rouan

Germany

Bergische Universität GH Wuppertal Deutches Kunststoff Institut Heraeus GmbH, Hanau Leipzig University Max Planck Institute for Colloids and Interfaces Technical University of Munich University of Duisburg University of Erlangen, Nuremberg University of Münster University of Ulm

Indian Institute of Technology, Kanpur

Mauritius University of Mauritius

The Netherlands

Delft University of Technology Eindhoven University of Technology University of Leiden-Gorleus Laboratory Utrecht University

Poland

Polish Academy of Sciences

Chalmers Institute of Technology Lund University Swedish Royal Institute of Technology

United Kingdom

St Andrews University, Scotland University of Bath University of Cambridge University of Cardiff University of Durham University of Leeds

United States of America

Cornell University University of California, Berkeley University of North Carolina University of Southern Mississippi University of Wisconsin, Madison

FUNDING

Anglo Platinum BYK Chemie GmbH, Germany **Borealis** Harmony Gold Heraeus GmbH, Germany Ikusasa Chemicals Kansai Plascon KWV Lummus Novolen Technology GmbH, Germany Mintek Mpact National Equipment Programme National Research Foundation (NRF) Netherlands Polymer Institute **NRF**Thuthuka Progressive Roads SARCHI Sasol Sastech Schlumberger Foundation Stellenbosch University THRIP Water Research Commission (WRC)



Contact details

Tel 021 808 3391 Fax 021 808 3385 E-mail physoffice@sun.ac.za Web www.sun.ac.za/physics

Research interests

Laser physics (spectroscopy and ultrafast science); nuclear physics (nuclear structure, nuclear reaction studies, radiation and applied nuclear physics); theoretical physics (condensed matter and complexity).

Research highlights

The solar energy research project at the Laser Research Institute (LRI) focuses on light induced charge transfer processes in organic dye sensitized and fully organic solar cells. Together with our established collaborators at the Universities of Giessen and Würzburg, we apply femtosecond laser spectroscopy equipment and expertise for characterisation and optimisation of fundamental light harvesting physics in novel solar cell materials.

The Ultrafast Science Laboratory operates a state of the art femtosecond electron diffraction apparatus. Researchers use this apparatus to investigate structural dynamics in cooperative systems with short temporal and atomic spatial resolution. The experimental capabilities were supplemented by a new ultra-high vacuum chamber and a helium cryostat, allowing for observation of structural dynamics of metal-insulator transitions down to temperatures of 20 kelvin.

The new energy research project at the Laser Research Institute unravelled fundamental light-induced charge dynamics in dye-sensitised solar cells. Within an international collaboration with Prof Derck Schlettwein, Institute for Applied Physics, University of Giessen (Germany), Dr Christian Litwinski, PicoQuant, Berlin (Germany), and Prof Tebello Nyokong, Chemistry Department, Rhodes University (South Africa) this activity aims to improve efficiency and applicability of novel sunlight harvesting devices.

Prof Shaun Wyngaardt presented a paper entitled "Towards a South African Underground Laboratory" at the International Conference on Topics in Astroparticles and Underground Physics (TAUP 2013), Italy. He co-organised the First International African Symposium on Exotic Nuclei (IASEN 2013) held in South Africa, organised by iThemba LABS in collaboration with the Joint Institute for Nuclear Research (JINR) in Russia. Together with Dr Noel Mkaza from the Faculty of Military Science at Saldanha, they hosted researchers from the JINR at the Saldanha campus to discuss the joint establishment of a fission detector which will study ternary fission phenomena as part of a postgraduate training programme in nuclear physics.

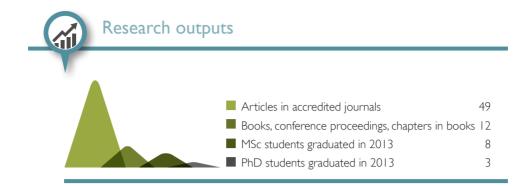
Prof Paul Papka co-organised the workshop on a Taste of Nuclear Physics and GAMKA (a powerful new gamma-ray spectrometer at iThemba LABS) held at the University of the Western Cape. Prof John Woods, professor emeritus in nuclear physics at the School of Physics at Georgia Institute of Technology (USA), visited the nuclear physics research group and presented a series of lectures on nuclear structure at Stellenbosch University and the Universities of the Western Cape and Cape Town.

The nuclear physics research group initiated the first steps towards the establishment of an underground research facility to, inter alia, investigate rare decays of atomic nuclei. As part of this initiative, Prof Richard Newman and Mr Milton van Rooy, a Phd student in nuclear physics, collaborated with iThemba LABS to perform measurements of radon levels and gamma ray background in the North Bore of the Huguenot Tunnel near Paarl. The northern tunnel is a second pilot tunnel which is still incomplete and has not been opened for traffic.

Various members of the Institute of Theoretical Physics presented their work at international conferences and workshops, as well as at the annual conference of the South African Institute of Physics. Most members of the Institute have been actively involved with some or other research activities at the National Institute for Theoretical Physics (NITheP) and in workshops held at NITheP. Students at the institute have continued contributing in Department of Physics outreach projects.

In an article published in *Physics Letters B*, Prof Herbert Weigel and collaborators Prof Noah Graham, Department of Physics at Middlebury College (USA) and Prof Markus Quandt of the Institute for Theoretical Physics at the University of Tübingen (Germany), showed that material effects can overcome the expected repulsion for the self-stress of a dielectric sphere. Prof Weigel also presented his research on non-linear phenomena in field theory at an international conference in Gallipoli (Italy).

Prof Hans Eggers organised a School on Bayesian Analysis in Physics and Astronomy, held



on the premises of the Department of Physics. More than half of the nearly 70 participants were South African postgraduate students. There was also much interest from the astronomy, astrophysics and cosmology community, which is all the more surprising since the

research collaboration on a national and international level. It was requested that the School be continued in some form and a local community of Bayesians be formed.

MSc student Mr Stefan Astl completed his thesis on a topic unifying nonlinear time series analysis and Bayesian modelling.

Ongoing school and conference organisation during 2013 included the 25th Chris Engelbrecht Summer School in Theoretical Physics on Non-Linear Phenomena in Field Theory, which will be held in Stellenbosch in 2014, with Prof Herbert Weigel as the principal organiser of this school. During 2014 a school on Geometry and Topology in Soft Matter, Optics and Biological Systems will also be hosted in Stellenbosch, with Prof Kristian Müller-Nedebock as the local organiser.

The Laser Research Institute (LRI) was host to a number of international laser scientists who participated in research activities. Prof Thomas Feurer, University of Bern (Switzerland) visited the LRI for a joint project on femtosecond laser pulse shaping together with PhD student Mr Dirk Spangenberg. Our annual guest and advisor, Prof Herbert Stafast from the Institute of Photonic Technology in Jena (Germany) was again involved in our vacuum ultraviolet molecular and solid state spectroscopy and nonlinear optics projects, supporting PhD students Mr Wilfrid Ndebeka and Mr Charles Rigby.

Other research visits were from Prof Petra Rudolph from the Zernike Institute in Groningen (Netherlands), Prof Tony Parker from Rutherford Appleton Laboratories (UK) and Prof Derck Schlettwein, University of Giessen (Germany).

Prof Heinrich Schwoerer and postdoctoral fellow Dr Nicolas Erasmus chaired a workshop on New Trends and Phases in Ultrafast Structural Dynamics held at the Stellenbosch Institute for Advanced Studies (STIAS). The workshop hosted ten PhD students from South Africa, Europe and North America as speakers and their supervisors as discussion leaders, and served as a highly productive forum for scientific discussions and networking for all attendees.

Dr Nicolas Erasmus presented a lecture and a poster on "Structural dynamics in transition metal dichalcogenides" at the third Banff Meeting on Structural Dynamics in Matter (Canada). Prof Heinrich Schwoerer co-chaired this event together with Prof Dwayne Miller (Universities of Toronto and Hamburg).

PhD student Mr Egmont Rohwer presented a poster on his organic solar cell project entitled "Ultrafast charge transfer reactions in indoline dye-sensitized ZnO solar cells" at the Next-Generation Organic Photovoltaics Conference 2013 in Groningen (The Netherlands).

Ms Iulia Minda (MSc student in Laser Physics) spent a five month research visit to the University of Giessen (Germany) studying electrochemistry and production of organic solar cells.

All senior members of the Laser Research Institute (LRI) actively participated in the sixth African Laser Centre student workshop, held at Zevenwacht (South Africa). Chairing the organising committee was Prof Erich Rohwer, with Prof Piet Walters serving as the



The School on Bayesian Analysis in Physics and Astronomy, hosted by SU's Department of Physics, was attended by over 70 postgraduate students from various South African universities.

administrative organiser. PhD student Mr Wilfrid Ndebeka and MSc student Mr Farooq Kyeyune gave oral presentations. Prof Heinrich Schwoerer presented a plenary lecture on ''Ultrafast Charge Transfer Reaction in Light Harvesting Devices''.

Prof Heinrich Schwoerer gave a lecture series during the first ALC Workshop on Lasers in Research and Teaching held at the University of Egerton (Kenya).The workshop was co-



organized by a 2012 PhD graduate from the department, Dr Zephania Birech, now a lecturer at the University of Nairobi (Kenya).

Academic affairs

PhD Student Mr Dirk Spangenberg and MSc student Mr Bart Smit travelled to the USA to represent the Stellenbosch Laser Student Chapter at the annual meetings of the International Society for Optics and Photonics (SPIE) and of the Optical Society of America (OSA).

The sixth African Laser Centre (ALC) student workshop, hosted by SU's Department of Physics, was well attended. During the workshop, the tenth anniversary of the establishment of the ALC was also celebrated.

Smit also attended the Frontiers in Optics conference in Orlando (USA) representing the OSA student chapter and Spangenberg represented the SPIE student chapter at the Optics and Photonics conference in San Diego (USA) and presented a talk.

Staff matters

Dr Gurthwin Bosman was appointed as lecturer in the laser research group. Prof Paul Papka was promoted to associate professor and Dr JJ Van Zyl to lecturer.

Awards to staff and students

Honours student Mr Janusz Meylahn was awarded the Meiring Naudé medal from the Faculty of Science for the best student in a BSc Honours programme in Physics. MSc student Mr Farooq Kyeyune was awarded the John Todd Morrison medal for research.

MSc student Mr Bart Smit won the first place and honours student Mr Lourie Pieterse the third prize at the "Suid-Afrikaanse Akademie vir Wetenskap en Kuns" postgraduate student awards.

At the annual South African Institute of Physics (SAIP) conference at the University of Zululand postgraduate students of the Department of Physics received several awards. The prize winners were Mr Monty Rohwer (best oral presentation by a PhD student in the field of Photonics), Ms Melanie Maclaren (best PhD presentation based on a publication in Photonics), Mr Darryl Niadoo (Best poster by a PhD student in Photonics) and Mr Wayne Koen (Concillium prize for best technology development). Mr Cobus Swarts and Mr Vusi Malazi shared the prize for the Best oral presentation by a PhD student in Nuclear Particle and Radiation Physics.

The efforts of our staff were recognised by the University. Ms Heleen Randall, Mr Stanley February, Prof Erich Rohwer and Prof Shaun Wyngaardt received SU Rector's Performance Awards.

Service to the scientific community

Staff members of the Department of Physics were closely involved with several national councils, organisations and schools, as well as with the organising of international conferences.

Prof Frederik Scholtz is the director of the National Institute for Theoretical Physics (NITheP), while Prof Hendrik Geyer is the director of the Stellenbosch Institute for Advanced Studies (STIAS). Prof Scholtz also served on the board of the South African Institute of Physics (SAIP) and is also chair of the SAIP Theoretical Physics Division. Prof Erich Rohwer is chair of the SAIP Photonics Division and serves on the steering committee of the Photonics Initiative of South Africa (PISA). Prof Hubertus von Bergmann is a director of the African Laser Centre (ALC).

The LRI was host to the 6th African Laser Centre (ALC) Student Workshop which was

hosted by the Laser Research Institute. The workshop was attended by 44 students and researchers from 15 countries. The guest speakers were Prof Tony Parker, Rutherford Appleton Laboratory (UK), Dr Zephania Birech, University of Nairobi (Kenya) and Prof Andrew Forbes from the National Laser Centre at the Council for Scientific and Industrial Research (CSIR) in Pretoria.

Prof Paul Papka is chair of the Physics Advisory Committee for the Separated Sector Cyclotron Facility at iThemba LABS, as well as a member of the Physics Advisory Committee of their Materials Research Department.

The Department of Physics once again presented its annual, one week introductory course on inductively coupled plasmas (ICP).

Community interaction

The outreach committee of the Department was very active. Staff and postgraduate students made contributions to Stellenbosch University initiatives, such as a Day in the Life of a Matie, the annual Stellenbosch University Open Day, the Maties Science Winter Week and Eskom International Science Fair.

The Optical Society of America (OSA) Student Chapter, together with postgraduate students in Theoretical and Nuclear Physics, visited high schools on the West Coast during a weeklong outreach programme. Financial support was granted by OSA, the International Society for Optics and Photonics (SPIE), NITheP and Stellenbosch University.

Proff Erich Rohwer, Heinrich Schwoerer, Piet Walters and Drr Pieter Neethling and Christine Steenkamp of the LRI were involved with organising and hosting the African Laser Centre student workshop which took place at Zevenwacht Estate. Various members of the LRI were also involved in supervising essay projects for students from the African Institute for Mathematical Sciences (AIMS).

The postgraduate students from the Physics Department held a successful Physics Open Day with demonstrations and laboratory tours, while Prof Kristian Müller-Nedebock presented a public lecture.



Postgraduate student **Ms Andrea von Flotow** gives a physics demonstration at one of the West Coast schools during the students' weeklong outreach programme.

NRF-rated researchers

Internationally acclaimed researcher Prof Anthony Cowley (*nuclear physics*) | Prof Hendrik Geyer (theoretical physics) | Prof Dieter Heiss (theoretical physics) | Prof Michael Kastner (theoretical physics) | Prof Frederick Scholtz (theoretical physics) | Prof Heinrich Schwoerer (laser physics) | Prof Herbert Weigel (theoretical physics)

Established researcher Prof Hans Eggers (theoretical physics) | Prof Richard Newman (nuclear physics) | Prof Erich Rohwer (laser physics) | Dr Christine Steenkamp (laser physics) | Prof Brandon van der Ventel (nuclear physics) | Prof Hubertus von Bergmann (laser physics) | Prof Shaun Wyngaardt (nuclear physics)

Promising young researcher Prof Paul Papka (nuclear physics)

Staff

Academic

Prof EG Rohwer* Dr.L. Boonzaaier Dr GW Bosman Dr A du Plessis Prof HC Eggers Prof HB Geyer Dr H Kriel Prof KK Müller-Nedebock Dr 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∥van Zyl Prof H Weigel Prof SM Wyngaardt

Extraordinary professors

Professofs Prof AA Cowley Prof T Dlamini Prof CA Dominguez Prof A Forbes Prof VD 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

Support Staff

C April DC Beukman AS Botha MC Botha J Burns SH February JM Germishuizen GJ Louwrens CD Pool DP Pool H Randall CJ Ruperti EJ Shields

* Executive head

Collaboration and Funding

COLLABORATION South Africa

Council for Scientific and Industrial Research, National Laser Centre Free State University iThemba LABS National Institute for Theoretical Physics (NITheP) Rhodes University University of Cape Town University of Cape Town University of Pretoria University of the Western Cape Square Kilometre Array (SKA)

Africa

African Institute for Mathematical Sciences (AIMS) African Laser Centre Africa Theoretical Physics Programme at the Stellenbosch Institute for Advanced Study (STIAS)

International China

Peking University, School of Physics

Germany

Leibniz-İnstitut für Photonische Technologien e.V. PicoQuant University of Giessen, Institute for Applied Physics University of Tübingen

India

Physical Research Laboratory (PRL) SN Bose National Centre for Basic Sciences

Russia

Joint Institute for Nuclear Research

United Kingdom

Bristol University Rutherford Appleton Laboratory(RAL) Oxfordshire

United States of America Syracuse University

FUNDING

African Laser Centre (ALC) CSIR Defence, Peace, Safety and Security (DPSS) CSIR National Laser Centre (NLC) Deutscher Akademischer Austauschdienst (DAAD) Earth Anti-NeutRino TomograpH (EARTH) Foundation Innovation Fund of the Department of Science and Technology iThemba LABS National Institute for Theoretical Physics (NITheP) National Research Foundation (NRF) Optical Society of America Pebble Bed Modular Reactor Scientific Development and Integration (Pty) Ltd South African Research Chair Initiative Programme (SARChI)

Square Kilometre Array (SKA)



Contact details

Tel 021 808 3146 Fax 021 808 3145 E-mail gas@sun.ac.za Web www.sun.ac.za/physiologicalsci

Research interests

Metabolic syndrome, diabetes and heart diseases (myocardial ischemia, diabetic cardiomyopathy); metabolic syndrome and HIV/AIDS; muscle physiology and biology; skeletal muscle atrophy and hypertrophy; satellite cells and myoblasts; cardiac metabolism, hypoxia and ischemia; multidisciplinary stress biology; cancer and modes of cell death; neurological disorders, exercise science; autophagy and neurodegeneration (Alzheimer's disease); autophagic flux, protein aggregation, neuronal migration and cell death susceptibility; autophagic flux and cell death in glioma.

Research highlights

During 2013 several staff members of the Department of Physiological Sciences participated in national and international conferences and symposiums.

Prof Faadiel Essop was a keynote speaker at the Chronic Diseases Management Workshop, hosted by the Western Cape Government. He also attended Experimental Biology, which is an annual meeting comprised of over 14 000 scientists and exhibitors in the fields of anatomy, physiology, pathology, biochemistry, nutrition and pharmacology. During this meeting his research work was presented at a symposium "Nutrients and cardiovascular health and disease: glucose, fatty acids and beyond".

Prof Anna-Mart Engelbrecht and Dr Ben Loos were both keynote speakers at the annual 41st Conference of the Physiology Society of Southern Africa hosted by MEDUNSA. Dr Ben Loos also presented a poster at the meeting of the International Union of Physiological Sciences (IUPS) in Birmingham (United Kingdom) as a capacity building delegate with the National Research Foundation's (NRF) South African Chapter. He also attended the prestigious course 'Autophagy in Neuroprotection', hosted by the Neuroscience School of Advanced Studies (NSAS), Cortona (Italy). He was an invited speaker at the Biophysics workshop, South African Institute of Physics, hosted by the University of Zululand . He presented a talk at the 51st annual Microscopy Conference of Mind Sport South Africa (MSSA) in Pretoria.

Prof Kathy Myburgh attended the European Muscle Conference in Amsterdam. She was an invited speaker at the 60th Annual Meeting of the American College of Sports Medicine

> and chaired the Current Issue Symposium. She was an invited speaker and session chair at the Indian Ocean Rim Muscle Colloquium. She presented invited lectures at the Universities of Palermo and Catania (Italy) and at the Nestlé Research Centre (Switzerland).

Prof Carine Smith attended the 2013 American College of Sports Medicine (ACSM) Annual Meeting and World Congress on "Exercise is Medicine", Indianapolis (Indiana). She was an invited speaker at a current issue symposium of the World Summit on Inflammation, which ran parallel with the ACSM meeting. The title of her talk was "Treatment of acute muscle damage: a view from immune cells".

As a result of the fruitful collaboration between Dr Ben Loos and Prof Anna-Mart Engelbrecth with Prof Zara Zakheri at Queens College (USA), an article "On the variability of autophagy and cell death susceptibility" was published in the high-impact journal Autophagy (impact factor 12.03). A research visit to the lab was funded by SU's Research Development office.

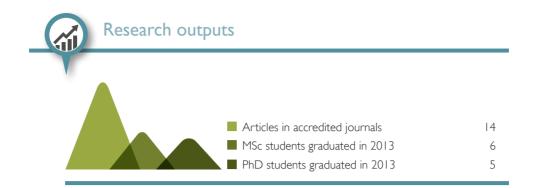
Prof Anna-Mart Engelbrecht received the honour of being invited by CANSA to showcase her research, 'Manipulation of autophagy: A novel strategy in chemotherapeutic intervention', as part of the CANSA Detectives series.

Prof Kathy Myburgh reached a significant milestone in her career when the number of citations of her publications exceeded 2 000. The most cited article (200+) emanates from her doctoral research and was published in 1990 in the Annals of Internal Medicine (impact factor 13.98). The most highly-cited paper published since she joined SU is a review published in 2008 in Sports Medicine (impact factor 5.2), which has been cited 66 times. Both articles highlight new directions of thinking related to injury in athletes. The first article highlighted, for the first time, that low bone density is an etiologic factor for stress fractures in male and female runners regardless of age, weight or biomechanics. This



Anton I

Working across disciplines are Dr Ben **Loos** (middle), from the Department of Physiological Sciences, with Prof Kristian Müller-Nedebock (left) and Dr Lee **Boonzaaier**, both theoretical physicists in the Department of Physics at SU.



is now a generally-known and accepted fact. The 2008-article highlights the problem that inflammation following muscle injury is still a poorly understood concept. The article also provides a framework for future studies.

Dr Ben Loos has expanded his research focus on neuro-degeneration by setting up *in vitro* models for Alzheimer's disease and has strengthened multidisciplinary approaches by including modelling and theoretical physics aspects. By working together with Prof Jannie Hofmeyr (biochemistry) and Prof Kristian Müller-Nedebock (theoretical physics), selected projects are tackling issues around autophagic flux and intracellular organelle behaviour.

Prof Faadiel Essop hosted a PhD student, Miss Florence Boyer, from the University of La Réunion (France). Their work forms part of a conjoint project with his French collaborator at the same university, Prof Emmanuel Bourdon. The study focuses on the post-translational effects of high glucose levels (with diabetes) on target proteins such as albumin, and the detrimental consequences on cardiac function. He also hosted Dr Kelly O'Connell, a postdoctoral fellow from the University of Sydney (Australia), as part of collaborative work done with Prof William Stanley from the same university. This project investigates the role of nonoxidative glucose pathways in terms of heart failure onset.

Prof Carine Smith has expanded her research interests – which broadly is the cross-talk between the inflammatory immune system and the neuroendocrine stress response system – to include investigation of neuro-inflammation, which is associated with many modern disease states for which there is currently no cure. She will investigate ways in which immune modulation may affect neurotransmission centrally and has secured funding from both the NRF and an industry partner for this purpose.

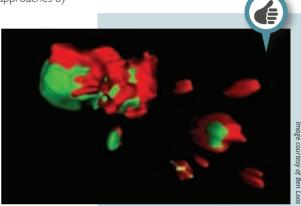
Prof Paula Robson-Ansley from the University of Northumbria (UK) visited the Multidisciplinary Stress Biology group of Prof Carine Smith. They discussed a new collaborative study investigating the influence of inflammation on trans-generational epigenetic modulation, scheduled to start in January 2014, and for which funding has been secured both from sources in the United Kingdom and South Africa's National Research Foundation (NRF). Two studies – one human and one in experimental animals – will run in parallel at the two universities involved. Two PhD students will be co-supervised by Professors Smith and Robson-Ansley. The two models of inflammation to be used, namely obesity and excessive exercise, will ensure wide applicability of results obtained.

Superresolution Structured Illumination Microscopy (SR-SIM) was successfully applied since the installation of the new Zeiss 780 EIYRA S. I system. This allowed researchers to visualise, for the first time in South Africa, intracellular processes at a resolution of 80 nm.

The Department's postgraduate numbers were sustained at record high levels and contributed to the successes in terms of overall research outputs. The standing of the department was confirmed by awards made to our staff and postgraduate students.

Academic affairs

Funded by the NRF Knowledge Fields Development Grant, Dr Ben Loos conducted training sessions on super-resolution microscopy techniques for research groups that focus on water analysis and pathogens. He also introduced a new honours module on integrative neurophysiology with a focus on systems physiology, neurodegenerative disorders and protein aggregation.



Stellenbosch University has the only facility in South Africa to observe really small molecules, their structure and movement by means of a specialised method termed super-resolution structured illumination. The image above shows an intracellular process (autophagosmal and lysosomal fusion).

Service to the scientific community

Prof Anna-Mart Engelbrecht serves on the executive committee of the South African Society for Cardiovascular Research (SASCAR). She also serves on the editorial board of the *International Journal of Biomedical Sciences*.

Prof Faadiel Essop was elected President of the Physiological Society of Southern Africa (PSSA). He was also elected as a fellow of the Cardiovascular Section of the American Physiological Society. He continued in his capacity as an elected member of the International Committee of the American Physiological Society, and as an elected council member of the African Association of Physiological Sciences. He was appointed as an academic editor of the *PLoS ONE* journal, and elected to the editorial boards of the *Journal of African Association of Physiological Sciences* and the *International Journal of Clinical & Experimental Physiology*. He

continued his services as editorial board member of the American Journal of Physiology Heart & Circulatory Physiology and Advanced Biomedical Research.

Dr Ben Loos serves as Capacity Building Delegate of the South African National Committee of the International Union of Physiological Sciences (SANC-IUPS). He was elected as treasurer and secretary of the Physiology Society of Southern Africa (PSSA). He also serves as one of the editors of the Microscopy Society of Southern Africa (MSSA) 2013 annual conference proceedings (category: life sciences).

Prof Kathy Myburgh is an associate of and division leader at the Euro-Mediterranean Institute for Science and Technology, a non-profit research organisation recognised by the European Commission. She is an associate member of the Muscle Biology Center at Kentucky University (USA) and an external mentor at the Institute of Human Performance, Rehabilitation and Technology at the Centre for Research and Technology (CERETETH) in

Greece. She is also the section editor for the journal *Biomed Central Physiology* and serves on the editorial board of the ACSM's flagship monthly journal, *Medicine and Science in Sports and Exercise*.

Prof Carine Smith and Prof Kathy Myburgh joined the editorial board of the international journal *Inflammopharmacology*.

Awards to staff and students

Prof Kathy Myburgh is an elected member of the Academy of Sciences of South Africa (ASSAf).

Dr Balindiwe Sishi featured in the *Mail and Guardian* as one of the top 200 Young South Africans for 2013 in the category science and technology. She also featured in an article in the *Eikestadnuus* of 4 July 2013, headlined "Stellenbosch youth inspires nationally", as well as in SU's inhouse magazine, *Kampusnuus*. Dr Sishi was an invited guest on the Hectic Nine-9 television show on 22 August 2013.

Dr Kathleen Reyskens was the winner of the prestigious Wyndham Student Presentation Competition at the 41st Annual Congress of the Physiology Society of Southern Africa. PhD students from all South African universities participated. MSc student Ms Megan Coomer was awarded first prize in the poster competition at the 48th annual meeting of the Society for Endocrinology, Metabolism and Diabetes of South Africa.

Dr De Wet Strauss was recognised by a top performing first year student as one of the most inspiring lecturers.

Staff matters

Prof Paula Robson from the University of Northumbria (United Kingdom) was appointed as a visiting professor in the Department.

After 27 years of service at the university, Mrs Catrina Martins (senior assistant) retired at the end of 2013.

Community interaction

The Department hosted its annual Research Day to showcase several of its research initiatives to a broader audience.



Dr Theo Nell from the Department of Physiological Sciences interacting with high school learners at the "Date with a scientist" event during the annual Maties Science Winter Week.

Dr Balindiwe Sishi led the Winter Week program for high school learners from disadvantaged schools. During this week learners gain 'hands-on' experience of Physiology. She also presented a talk on ''Cardiotoxicity: the 'sliding doors' concept - where cardiology meets oncology or vice versa'' on SU's Tygerberg campus.

Three members of our staff, Dr Theo Nell, Dr Balindiwe Sishi and Dr Ben Loos, were invited to interact with high school learners during the "Date with a scientist" event organised during the annual Maties Science Winter Week. Dr Ben Loos and his research group presented a talk during the High Science meets High School event organised by the SU divisions for Research Development and Community Interaction. After the talks a DVD was produced and distributed to the respective high schools.

NRF-rated researchers

Internationally acclaimed researcher Prof Kathy Myburgh (skeletal muscle biology) Established researcher Prof Faadiel Essop (cardiac metabolism) Promising young researcher Prof Anna-Mart Engelbrecht (cell-death and signalling)



Collaboration and Funding

Academic

Prof MF Essop* Prof A-M Engelbrecht Dr B Loos Prof KH Myburgh DrT Nell Dr B Sishi Prof C Smith Dr JA deW Strauss

Support staff

Mr A Isaacs Mr J Isaacs Dr A Krygsman Dr L Lacerda Ms C Martins Ms G Simon

* Departmental chair

COLLABORATION South Africa

North West University University of Cape Town University of Pretoria University of KwaZulu-Natal Stellenbosch University: Faculty of Medicine and Health Sciences (Division of Medical Physiology; Division of Molecular Biology and Human Genetics); Department of Biochemistry; Department of Physics

Africa

University of Botswana

International Australia

Griffith University

France University of La Réunion

Norway University of Bergen

United States of America Queens College University of North Carolina

FUNDING

Cancer Association of South Africa Jeanette Luttig Trust Scholarships Medical Research Council (MRC) National Research Foundation (NRF) National Institute of Health (NIH), John E. Fogarty International Center (FIC) Stellenbosch University University of Northumbria, United Kingdom Verve Dynamics (contract research)



Contact details

Tel 021 808 5847 Fax 021 808 5846 E-mail whvz@sun.ac.za Web www.sun.ac.za/microbiology

Research interests

Bioprocessing of agricultural products; bioprospecting for enzymes and enzyme engineering; genetic manipulation of yeasts for the conversion of plant material to bioethanol and production of enzymes in yeast and fungi; taxonomy of lactic acid bacteria; characterisation of antimicrobial peptides (including bacteriocins) produced by lactic acid bacteria and their industrial application; industrial and medical microbiology; fungal communities from fynbos soil; biology of soil fungi, particularly *Penicillium* and *Mucor*; the interactions between yeast and their biological, chemical and physical environment; taxonomy of ascomycetes; development of probiotic lactic acid bacteria for humans and animals; antibiotic resistance of waterborne pathogens; monitoring and optimisation of domestic rainwater tanks.

Research highlights

The Department maintains a high number of postgraduate students (13 Honours, 15 MSc and 19 PhD students) and is particularly pleased with the increase in PhD students.

Staff attended a number of conferences and presented lectures at national and international conferences and institutions. The Department was well represented at the 18th biannual conference of the South African Society of Microbiology at Bela-Bela (South Africa). Prof Douglas Rawlings and Prof Emile van Zyl delivered keynote addresses. Prof Leon Dicks and Dr Riaan den Haan were invited as plenary speakers at the same event. The Department was also proud to see one of Prof Van Zyl's former students, Dr Evodia Setati, presenting as a keynote speaker. Dr Setati is currently a senior researcher at SU's Institute for Wine Biotechnology Research.

Dr Wesaal Khan was an invited speaker at the Pan Africa Chemistry Network (PACN) Congress on Sustainability in Africa that took place in Addis Ababa (Ethiopia).

Dr Michelle de Kwaadsteniet and Ms Penelope Dobrowsky were invited speakers at the 4th Municipal Water Quality Conference at Sun City (South Africa).

> Prof Van Zyl attended the 35th Symposium on Biotechnology for Fuels and Chemicals in Oregon (USA) as an invited speaker. He was invited to present talks at the Chemical and Biological Centre, Umeå University (Sweden) and the Faculty of Science, Leiden University (Netherlands). Prof Van Zyl was also invited as opponent for a PhD-defense at Chalmers University of Technology (Sweden).

Prof Leon Dicks presented a talk at Cipla Neuroscience Forum (CNS) held in Kleinmond (South Africa).

Prof Luis AB Cortez, Vice-Rector: International Relations, University of Campinas (Brazil), visited the Department to discuss the Latin America, Caribbean and Africa project (LACAf) funded by Sao Paulo State, as well as the possibility of a collaboration agreement between Stellenbosch University and the University of Campinas.

Prof Karin Jacobs joined an NRF delegation to visit Chinese counterparts in Beijing (China). She presented a talk entitled "Fynbos soils of the Western Cape: a model for fungal studies". Dr Etienne Slabbert presented a poster at the 2nd Thünen Symposium on Soil Metagenomics in Braunschweig (Germany).

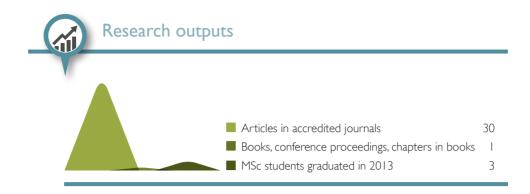
Several of the postgraduate students made their voices heard at international conferences. Ms Angela Botes, Ms Marlin Mert and Mr Heinrich Kroukamp presented posters at the 26th International Conference on Yeast Genetics and Molecular Biology, Frankfurt/Main (Germany). Following the conference, Heinrich Kroukamp visited the laboratory of Prof J Thevelein in Leuven (Belgium) and Marlin Mert visited the Department of Agronomy, Food, Natural Resources, Animals and the Environment (DAFNAE) at the University of Padova as part of collaboration projects between Stellenbosch University and the KU Leuven and the University of Padova.

Other highlights for 2013 include Prof Doug Rawlings acting as Dean of the Faculty of Science and ProfVan Zyl being a finalist in the prestigious NSTF-BHP Billiton Awards Event in the category research capacity building. At the end of 2013 Prof Leon Dicks launched a new probiotic (entiro[™]) in all major pharmacies in South Africa. The research for the



oto: Anton Jordaa

Prof Emile van Zyl (far right) with guest speakers Dr Stefan de Goede (Sasol Technology), Dr Sergio Trindade (SE²T International) and Dr Ibrahim Mayaki (NEPAD) at the 20th International Symposium on Alcohol Fuels which took place in Stellenbosch.



development of this probiotic was funded by the pharmaceutical company Cipla Medpro, who is also responsible for its production and marketing.

Academic affairs

The Department continues to address the challenges and opportunities identified in the five-year self-evaluation process conducted in 2011. The feedback report, finalised in 2012, acknowledged the Department's good research profile and high undergraduate success rates flowing from a strong staff component characterised by a spirit of collegiality and mutual support. However, challenges such as increasing undergraduate student numbers, maintaining the required number of PhD students and fluctuating external funding to support research were also highlighted.

In 2013, the Department started to implement a programme-wide recurriculation exercise to reintroduce microbiology as a major subject with four final year courses to be phased in during 2014. At the same time, the content of all microbiology courses were reconsidered and aligned to increase the depth of microbiology teaching at the final year level to better prepare students for a postgraduate qualification. Course requirements were also revisited.

Service to the scientific community

Prof Leon Dicks serves on the editorial boards of several research journals, including *Probiotics and Antimicrobial Proteins; Beneficial Microbes; Annals of Microbiology;* and *Bioscience of Microbiota, Food and Health* (BMFH), which is the joint scientific journal of the Japan Bifidus Foundation, the Japanese Association for Food Immunology and the Japan Society for Lactic Acid Bacteria. He is editor in chief of the *South African Journal of Enology and Viticulture*.

Prof Karin Jacobs served as the vice-president of the African Mycological Association and is a member of the editorial board of the journal *Mycology*.

Prof Alf Botha is a member of the editorial boards of the *Canadian Journal of Microbiology;* and *FEMS Yeast Research*. He is a reference group member for Water Research Commission projects and a member of the Materials Research Group (MRG) Users Advisory Committee at iThemba LABS.

Prof Emile van Zyl was chairman of the 20th International Symposium on Alcohol Fuels (ISAF) which took place in Stellenbosch and he continued as member of the Advisory Board of the BioImprove Programme in Sweden.

Dr Heinricch Volschenk is a member of the South African Society for Microbiology (SASM).

Prof Douglas Rawlings, Prof Bernard Prior, Prof Emile van Zyl, Prof Alf Botha and Prof Leon Dicks continued to serve as members of the South African Academy of Arts and Science.

Awards to staff and students

Prof Emile van Zyl was a finalist in the 2013 NSTF-BHP Billiton Awards in the Category: Research Capacity Development. Prof Leon Dicks was elected as a member of the Royal Society of South Africa.

Staff matters

Prof Douglas Rawlings acted as Dean of the Faculty of Science, while the process of appointing a new dean was in progress.



During the annual Maties Science Winter Week, learners were introduced to microbiology by swabbing everyday items, such as furniture and dustbins, and then inoculating it into these test tubes. This was to make learners aware of the fact that microbes are everywhere!

Community service

Staff members associated with the Department of Microbiology presented overviews of their research interests at numerous national and international forums. Dr Wesaal Khan and Dr Heinrich Volschenk coordinated the Department's involvement with learners from regional schools on the Stellenbosch University Open Day, the Maties Science Winter Week and other ad hoc visits. These sessions informed learners of the field of microbiology and highlighted the diverse research areas and job opportunities available.

NRF-rated researchers

Internationally acclaimed researcher Prof Alf Botha (yeast and fungal ecology) | 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)

Established researcher Prof Marinda Bloom (*fungal bioprocessing*) | Prof Karin Jacobs (*microbial ecology*) | Dr Heinrich Volschenk (*bioprospecting for enzymes and expression of foreign proteins in yeast*)

Staff

Academic

Prof WH van Zyl* Prof M Bloom Prof A Botha Prof TE Cloete** Prof LMT Dicks Prof K Jacobs T Jansen Dr W Kahn Prof DE Rawlings*** Dr H Volschenk

Extraordinary

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

Support staff

L J Daniels M Gey van Pittius R Jacobs MH Koopman J Daniels LA Malherbe M Stuurman T van der Merwe L van der Westhuizen W Wentzel

* Chairperson ** Vice-Rector: Research & Innovation *** Acting dean

Collaboration and Funding

COLLABORATION South Africa

Agricultural Research Council (ARC) Nietvoorbij Cape Peninsula University of Technology (CPUT) Council for Scientific and Industrial Research (CSIR) Medical Research Council (MRC) Polytechnic of Namibia (PON) Rhodes University University of Kwa-Zulu Natal (UKZN) University of the Western Cape (UWC) Water Research Commission (WRC)

Africa

New Partnership for Africa's Development (NEPAD)

International

Belgium Katholik University Leuven

Brazil University of Campinas

France

Musée National d'Histoire Naturelle Italy

Padova University

Japan

Kobe University Kyushu University Tokyo University of Agriculture University of Tokyo

Netherlands

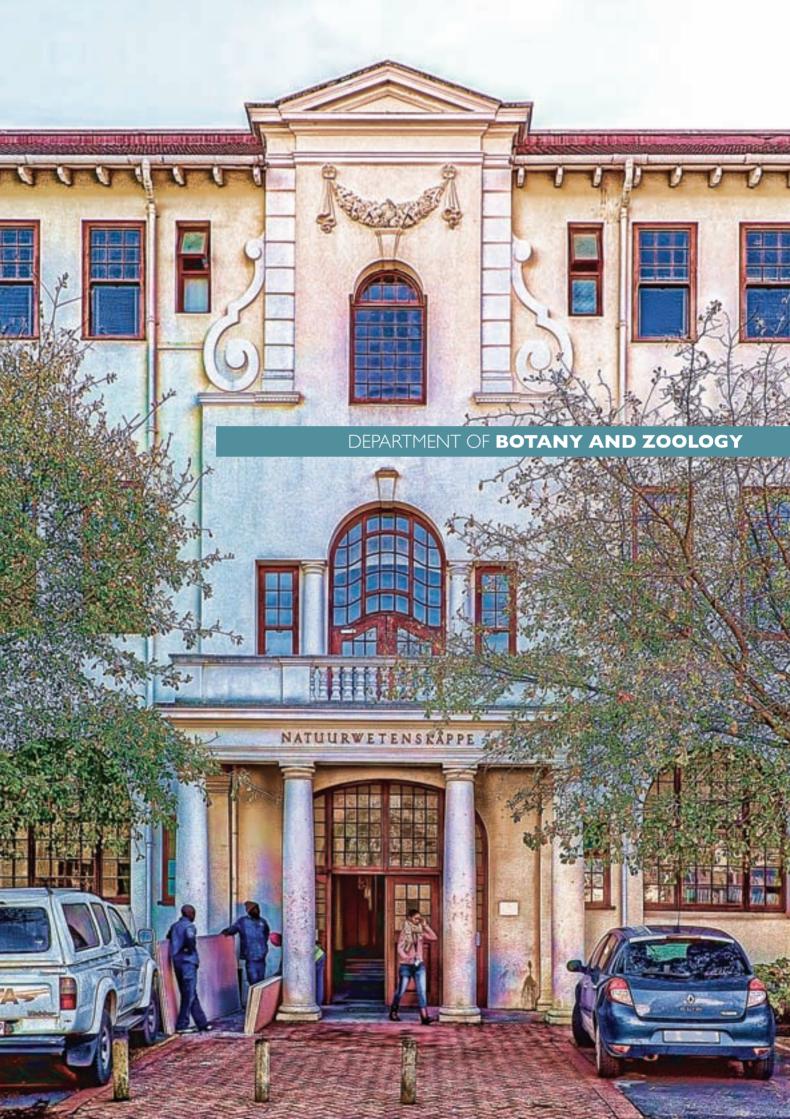
Centraal Bureau voor Schimmelcultures (CBS)

Sweden

Umeå University **United States of America** Dartmouth College

FUNDING

Cipla Medpro Department of Science and Technology (DST) Jerome and Evelyn Smith Family Trust National Research Foundation (NRF) Polytechnik of Namibia (PON) Technology and Human Resources for Industry Programme (THRIP) Technology Innovation Agency (TIA) Water Research Commission (WRC)



Contact details

Tel 021 808 3236 Fax 021 808 2405 E-mail botzoo@sun.ac.za Web www.sun.ac.za/botzoo

Research interests

Animal biodiversity; Antarctic and Southern-island research; behavioural ecology of vertebrates; Cape flora; climate change; community ecology; economic botany; conservation genetics and phylogeography; ecotoxicology; ecotoxicogenomics; endocrine disruption; evolutionary genomics of animals; evolutionary physiology of animals; fynbos ecology and genomics; herpetology; indigenous plant use and medicinal plants; insect behaviour and physiology; ecophysiology; invasion biology; macroecology; molecular systematics; palaeontology; plant animal interactions; plant biodiversity; plant biochemistry; plant biotechnology; plant ecophysiology; plant systematics; stress ecology; vertebrate functional genomics; plant mycorrhiza-fung; plant systematics; stress ecology; vertebrate functional biology.

Research highlights

The Department's staff take pride in the fact that the majority of the research outputs are published in high profile journals accredited with the Institute for Scientific Information (ISI). Furthermore, members of the Department of Botany and Zoology received more than R10 million in the form of research funding, and 75% of the academic staff have NRF ratings (A = 2; B = 2; C = 5; P = 1; Y = 8).

The research productivity of the Department and the Centre for Invasion Biology (C•I•B), a NRF/DST Centre of Excellence hosted by the Department, attracted 38 new postgraduate students (18 honours; 16 MSc and four PhD). The Department and the C•I•B also attracted many prominent national and international visitors and provide an academic home to 15



postdoctoral fellows from five nationalities. Through these active collaborations the Department hosted Prof Ben Oldroyd and Dr Madeleine Beekman of the University of Sydney (Australia), Prof Grzegorz Buczowski from Purdue University (USA), Dr Kyle Dexter of the University of Edinburgh (Scotland), Prof Vagner Benedito from West Virginia University (USA), Dr Laurel Serieys from the University of California at Los Angeles (USA), Dr Dane Penetta of the University of Melbourne (Australia) and Dr lessica Gurevitch from State University of New York (USA). Some of the national visitors who also presented seminars in

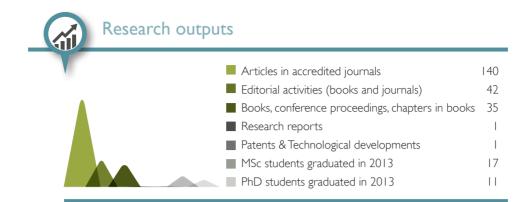
Annual group picture of staff and postgraduate students in the Department of Botany and Zoology at SU.

the Department were Dr Jonathan Clark of the Schools Development Unit at the University of Cape Town, Prof Shirley Brooks from the Department of Geography and Environmental Studies at the University of the Western Cape and Prof Rachel Wynberg from the Department of Environmental and Geographical Science at the University of Cape Town.

Academic staff of the Department and the C•I•B attended and presented research at several national and international conferences. On an international level, Dr Carol Simon presented at the International Polychaete Conference in Sydney (Australia).

Dr Sophie von der Heyden was invited to join INDEEP's connectivity meeting at Tallahassee (Florida, USA). INDEEP is an international network for scientific investigation of deep-sea ecosystems. She also attended the Indo-Pacific working group on the Ecology and Evolution of the Indo-Pacific at the National Evolutionary Synthesis Centre (NESCENT) in Durham, (North Carolina, USA).

Prof Conrad Matthee visited collaborators at the University of Montpellier for a meeting of the Groupement de Recherche International (GDRI). He delivered a plenary address at



the 9th International Conference on Behaviour, Physiology and Genetics of Wildlife in Berlin (Germany).

Prof David Richardson and Dr Jaco le Roux attended the 2013 meeting of the Ecology and Management of Alien Plant Invasions (EMAPI) organisation in Pirenopolis (Brazil). During their sabbaticals, Dr Carol Simon conducted research at Tohoku University in Sendai (Japan), while Dr Jaco le Roux visited the Universities of Girona (Spain) and Montpellier (France). Staff also attended a number of national conferences in South Africa.

The Department of Botany and Zoology is the home of choice for several research associates who contribute towards research productivity. They are Profs Jan Nel, Eddie van Dijk, Jan Giliomee, Dan Baird, Sophie Reinecke, Koot Reinecke, and Drr Ted Oliver, Edmund Pool, Willie Sirgel, Krystal Tolley, John Wilson, Colin Tillbury and Sue Jackson.

Academic affairs

At undergraduate and honours level, the Department was responsible for teaching six modules in Biology (first year), 12 modules in Biodiversity and Ecology (second and third year) and six modules in honours. In some of the larger or specialised subjects the Department made use of teaching assistants. The Department contracted the following staff: Dr Juri van den Heever (Biol 111, Honours Excursion), Dr Marinus de Jager (Biol 124, 212, 124), Dr Kenneth Oberlander (Biol 124, 144), Dr Mhairi Alexander (BDE 364), Mr Vernon Visser (Hons GIS course), Mr Christoff Truter (Biol 124, 154), Ms Natasha Mothapo (Biol 144, 154).

A new module on invasion biology has been designed and will be introduced during 2014. The revised Biodiversity and Ecology programme implemented during 2012 produced the first graduates at the end of 2013. The aim of the new programme is to allow students exposure to a more focussed curriculum in Botany and Zoology and related subjects in order to provide them with training in various aspects of biodiversity, evolution and ecology.

The Department continued with the interactive tutorial system for small groups of firstyear learners with different levels of competencies. Dr Marnel Mouton took over as academic coordinator of the tutorial programme from Prof Theresa Wossler. Dr Mouton is also responsible for the development of course content for Introduction to Biology for the Extended Degree Programme. Mr Edward Archer was appointed as a full time tutorial assistant to aid in further development of the programme.

On postgraduate level 42 students successfully completed their degrees (14 Honours, 17 MSc and 11 PhD). At present there are 42 Masters and 30 PhD students registered in the Department. During 2013, 16 MSc and four PhD students successfully presented project proposals. Three upgrades from MSc to PhD were evaluated and recommended by the Department's academic committees.

Service to the scientific community

Several staff acted as external examiners for courses or served on advisory panels to various conservation and government bodies and on the editorial boards of several prestigious journals.

Prof Michael Cherry served as associate editor of *Emu* and on the editorial board of *Folia Zooligia*, as well as a trustee for the Kalahari Research Trust. Dr Allan Ellis served as board secretary of the South African Association of Botanists. He is also associate editor of the

DEPARTMENT OF BOTANY AND ZOOLOGY

Botanical Journal of the Linnaen Society and external examiner for the undergraduate Botany course at the University of Cape Town (UCT). Dr Carol Simon acted as an abalone farm consultant and as representative on the International Polychaete Association. She is editor of *African Zoology* and the Zoology Society of South Africa's (ZSSA) Newsletter.

Dr Nokwanda Makunga acted as external examiner for the Universities of the Free State and Cape Town. She is president of SAAB and principal investigator of a research project in partnership with Footprint Management Solutions and funded by THRIP. She served as associate editor of the *South African Journal of Botany* as well as on the scientific committee of the Medical Research Council's Research Day.

Prof Alex Valentine was on the advisory board of the JS Marais Park's Management Committee, while Prof LeFras Mouton served on the advisory board of the Rooi Cederberg Karoo Park and on the steering committee of SARCA (*Southern African Reptile Conservation Assessment*). He serves on the editorial board of the *African Journal of Herpetology* and is associate editor of *African Zoology*. He acted as coordinator of the Cape Herp Society meetings and frequently contributed towards radio interviews in the Radio Sonder Grense (RSG) programme "Hoe verklaar jy dit?"

ProfTerry Robinson served as an assessor for the National Research Foundation, is a board member of the International Cytogenetic and Genome Society, was on the editorial boards of the journals *Chromosome Research* and *Cytogenetics and Genome Research* and subject editor for *Heredity*.

Prof Theresa Wossler served as assistant editor for the journal *African Entomology*, acted as external examiner for Rhodes University and is active on the Helderberg Advisory Committee. Prof Hannes van Wyk served on the steering committee of the Water Research Commission and was a member of the evaluation panel for the Junior Captain Scott Medal panel. He is the editor of the journal *African Zoology*. Prof Conrad Matthee was a member of the Endangered Wildlife Trust Riverine Rabbit steering committee and served as associate editor for the journals *Koedoe*, *African Journal of Marine Science*, *Integrative and Comparative Biology* and *Molecular Phylogenetics and Evolution*. Prof Anton Pauw is trustee of the Wildflower Conservation Trust, member of the Red Hill Conservation Group and subject editor for the *South African Journal of Botany*.

Dr Susana Clusella-Trullas served on the editorial boards of the *Journal of Thermal Biology, Frontiers in Invertebrate Physiology* and *Austral Ecology.* Dr Cang Hui served on the editorial boards of the journals *Biological Invasions, Applied Mathematical and Computational Sciences, The Open Zoology Journal* and *The Scientific World Journal.* Dr Jaco le Roux served on the grant and rating review panel of the National Research Foundation, and on the Czech Science Foundation's panel for grant reviews. He was associate editor of *Biological Invasions.* Dr Sophie von der Heyden served on the NRF SARChi panel and was part of the organising committee of the South African Marine Science Symposium.

Prof Leanne Dreyer was a scientific consultant for *Woordeboek van die Afrikaanse Taal.* She is a core member of the DST-NRF Centre of Excellence in Tree Health Biotechnology. Prof Savel Daniels served on the National Research Foundation (NRF) postdoctoral panel and the steering committee of the South African National Biodiversity Institute (SANBI). Dr Victor Rambau served on the committee for the Zoological Society of Southern Africa, and as a panel member of the South African National Biodiversity Institute (SANBI). Prof Valdon Smith was the editorial advisor of the journal *Polar Record.* Prof Dave Richardson served on the editorial board of *Diversity and Distributions, Ecology, Biodiversity and Conservation,* as well as *Conservation Biology.*

A number of staff members are members of the organisational structure, decision-making and administering of funds for various service organisations, such as the South African Association of Botanists (SAAB), the Agricultural Research Council (ARC), the Zoological Society of Southern Africa (ZSSA), the South African Council for Natural Scientific Professions (SACNSP), the South African National Biodiversity Institute-National Research Foundation Biodiversity Focus Panel, the South African Society for Systematic Biology Council (SASSB), the Global Biodiversity Information Facility, the Lagomorph Specialist Group, the Onderstepoort Veterinary Research Institute, the Kalahari Research Trust, the Helderberg Advisory Committee, the Riverine Rabbit Working Group Steering Committee, the Water Research Commission (WRC) steering committee, the Junior Captain Scott panel, South Africa Reptile Conservation Assessment (SARCA), the Wildflower Conservation Trust and the South African National Biodiversity Institute (SANBI).

Some of the international service organisations we are accosiated with, are the Australian Antarctic Division, Nederlandse Organisatie voor Wetenschappelijk Onderzoek(NWO)



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The SharkSafe project, developed by **Prof Conrad Matthee** and PhD-student **Sara Andreotti**, consists of rigid upright pipes which resembles kelp when it floats in water. Overlapping rows of pipes are anchored to the seabed and stand upright up to the height of the water during high tide. A magnetic field is created by inserting magnets into the pipes.This forms a "cage" of loose pipes, so fish and other sea animals can easily pass through the cage, while the sharks are kept out. (Netherlands), the National Geographic Society Committee for Research and Exploration (USA), the International Union for the Conservation of Nature, the European Union's Organisation for Economic Cooperation and Development's Amphibian panel, the UK National Environmental Research Council and the Netherlands Institute for Ecological Research.

Awards to staff and students

Noteworthy awards received by our academic staff for 2013 include the Havenga Prize for Life Sciences which was awarded to Prof Dave Richardson. SharkSafe, a project by Prof Conrad Matthee and PhD student Sara Andreotti, was selected as a recognised project for the 2014 Cape Town World Design Capital.

Several of our students performed well at conferences and, in collaboration with their supervisors, received outstanding awards. Mr Andrew David received the Best Student Presentation award at the International Conference of Invertebrate Reproduction and Development; Ms Natasha Mavengere received the Best Young Scientist award at the 12th International Conference on Ecology and Management of Plant Invasions; Ms Tendai Musvuugwa was awarded Best Student Presentation at the Student Conference on Conservation Sciences in Nairobi (Kenya); Mr Chris Broeckhoven received the award for the Best PhD presentation at the European Congress of Herpetology, with Ms Genevieve Diedericks the runner-up at the same conference.

At the 39th annual meeting of the South Africa Association of Botanists the winners were Dr Sjirk Geerts (SAAB Junior Bronze medal), Mr Christopher Johnson (Best Young Scientist) and Dr Marinus de Jager (Best Oral Presentation). Ms Lona Mjindi won the Best Student Poster award at the Aquaculture Association of South Africa's conference.

Staff matters

Promotions from 1 January 2013 included Dr Anton Pauw and Dr Alex Valentine to Associate Professors, and Dr Sophie von der Heyden to Senior Lecturer.

During 2013, Prof Leanne Dreyer and Prof Savel Daniels was promoted to full professor, Dr Allan Ellis and Dr Bruce Anderson to associate professor and Dr Jaco Le Roux to senior lecturer. The promotions are effective from 1 January 2014.

Professor Conrad Matthee received a B-rating and Dr Jaco le Roux a Y-rating from the National Research Foundation. Dr Marnel Mouton was appointed as lecturer in the extended degree programme from I July 2013 to December 2018. Professor Valdon Smith retired at the end of 2013 after 17 years of service (of which six years as chair of the Department of Botany). He will maintain a close relationship with the Department as a research fellow.

Community interaction

A number of lecturers were involved in the Maties Science Winter week under the leadership of Prof Leanne Dreyer. Learners were made aware of the sustainable utilisation of biodiversity for both commercial and cultural benefits. The C•I•B limbovane project continued to be very successful in teaching biodiversity to teachers and high school scholars.



Prof Valdon Smith retired at the end of 2013, after 17 years at Stellenbosch University.

NRF-rated researchers

Leading international researcher Prof Dave Richardson (biological invasions and conservation biogeography) | ProfTerry Robinson (evolutionary genetics and phylogenomics of mammals)

Internationally acclaimed researcher Prof Conrad Matthee (molecular systematics and phylogeography) | ProfValdon Smith (Antarctic and Southern Island biology and ecology)

Established researcher Prof Leanne Dreyer (evolution of the Cape Flora) | Prof Mike Cherry (behaviour ecology) | Prof Savel Daniels (molecular systematics, phylogeography and conservation of invertebrata) | Prof Le Fras Mouton (evolutionary ecology of lizards) | Prof Alexander Valentine (molecular physiology of host-microbe interactions of legumes in phosphorus deficient soils)

NRF Prestigious Awardee Dr C Hui (invasion biology, mathematical ecology)

Promising young researcher Dr Bruce Anderson (plant-animal interaction) | Dr Susana Clusella-Trullas (thermal adaptation of ectotherms and implications for climate change) | Dr Allan Ellis (evolutionary ecology of plants and insects) | Dr Jaco le Roux (evolutionary biology and ecology of plant invaders) | Dr Nokwanda 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)

Staff

Academic

Prof CA Matthee* Dr BC Anderson Prof MI Cherry Dr S Clusella-Trullas Prof SR Daniels Prof LL Dreyer Dr AG Ellis Dr AF Flemming Dr II Le Roux Dr NP Makunga Prof PLN Mouton Dr M Mouton Prof CA Pauw Dr RV Rambau Prof DM Richardson ProfTI Robinson DrTB Robinson Dr CA Simon ProfVR Smith Prof Al Valentine Prof JH van Wyk Dr S von der Heyden ProfTC Wossler

Centre of Excellence for Invasion Biology Prof DM Richardson Dr C Hui

* Executive head ** Director since May 2012

Extraordinary professors

Prof AM Bauer Prof S Barrett Prof SL Chown Prof KJ Gaston Prof MA McGeogh Prof L Mumba Prof K Tolley Prof B van Wilgen

Support staff L Willems***

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

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K Coombe-Davis S Davies M De Morney D du Plessis M Gaertner A Garthwaite K Jumbam S Kritzinger-Klopper E Marais C Momberg E Nortje R Olivier C Scheepers M van der Vyver IRU Wilson

*** Principal secretary

Collaboration and Funding

COLLABORATION South Africa

Agricultural Research Council, Nietvoorbij Agricultural Research Council, Pretoria CapeNature Cape Peninsula University of Technology (CPUT) Council for Scientific and Industrial Research (CSIR), Natural Resources and the Environment unit Department of Agriculture, Forestry and Fisheries Department of Environmental Affairs DST-NRF Centre of Excellence in Tree Health Biotechnology Endangered Wildlife Trust Forestry and Agricultural Biotechnology Institute (FABI) Iziko Museum of Cape Town Medical Research Council (MRC) Nelson Mandela Metropolitan University Northwest University Perishable Products Export Control Board (PPECB) Plant Protection Research Institute Rhodes University Sasol Technology

South African Institute of Aquatic Biodiversity (SAIAB) South African National Biodiversity Institute (SANBI) South African National Parks (SANParks) University of Cape Town University of KwaZulu-Natal University of Pretoria University of Pretoria: Faculty of Veterinary Science University of Pretoria: Faculty of Veterinary Science University of the Free State University of Venda University of the Western Cape Working for Water Programme

International

Argentina

University of Cordoba University of Rio Cuarto

Australia

Australian Antarctic Division Australian National University Commonwealth Scientific and Industrial Research Organisation (CSIRO) Curtin University of Technology Department of Environment and Conservation, Western Australia James Cook University Kings Park and Botanic Garden Macquarie University University of Adelaide: School of Earth and Environmental Sciences; Australian Centre for Evolutionary Biology & Biodiversity (ACEBB) University of Melbourne University of Queensland University of Sydney

Belgium University of Ghent: Flanders Institute for Biotechnology

Brazil Universidade Federal de Santa Catarina Canada

Simon Frazer University University of Toronto

China

Guangdong University of Technology Hefei University of Technology Lanzhou University Kunming Institute of Botany

Czech Republic

Academy of Sciences of the Czech Republic Botanical Institute Charles University Veterinary Research Institute, Brno

Denmark

University of Copenhagen

Finland

University of Jyvyskyla

France

Université Montpellier II: Centre de Biologie pour la Gestion de Populations; Centre d'Ecologie Fonctionnelle et Evolutive; Institut des Sciences de l'Evolution Institut National de l'Environnement Industriel et des Risques (INERIS) Museum national d'Histoire naturelle National Centre for Scientific Research (CNRS) Université de France-Comte Université de Montpellier I Université Paul Sabatier Toulouse III

Germany

Alfred Wegener Institute for Polar and Marine Research University of Braunschweig University of Freiburg University of Hamburg University of Leipzig

University of Würzburg

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Hungarian Academy of Sciences

India India Institute of Science

Iran Tarbiat Modares University

Italy University of Bologna University of Siena

Japan Kyoto University National Institute for Basic Biology

Kenya University of Nairobi

The Netherlands Data-Analyse Ecologie Wageningen University

New Zealand University of Auckland

Norway University of Oslo

Poland Jagelonian University Institute of Botany, Polish Academy of Sciences

DEPARTMENT OF BOTANY AND ZOOLOGY



Collaboration and Funding

Portugal

Instituto Superior de Psicologia Aplicada (IPSA) Technical University of Lisbon University of Evora

Spain

Centre Technológic Forestal de Catalunya Doñana Biological Station National Museum of Natural Sciences Universidad de Girona Universidad de Oviedo Universidad Pablo de Olavido Universidad de València

Sweden

Lund University Stockholm University Swedish University of Agricultural Sciences

Switzerland

University of Zurich University of Lausanne

United Kingdom

British Antarctic Survey British Trust for Ornithology Cambridge University Plymouth Marine Laboratory Queen Mary College, University of London Royal Botanic Gardens Kew University of Sheffield

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Cornell University Field Museum Chicago Florida State University The Samuel Roberts Noble Foundation University of California (Berkeley) University of California (Davis) University of California (Santa Cruz) University of California (Santa Cruz) University of Hawaii University of Hawaii University of South Georgia University of Vermont University of Villanova University of Wisconsin West Virginia University

FUNDING

British Ecological Society Claude Leon Foundation Centre National de la Recherche Scientifique (CNRS) Citrus Research International Council for Scientific and Industrial Research (CSIR) Department of Agriculture, Forestry & Fisheries (DAFF) Department of Science and Technology (DST) Ernst Oppenheimer Fellowship Trust Fund German Academic Exchange Service (DAAD) University of Montpellier, France National Geographic Society of America National Natural Science Foundation of China (NSFC) National Research Foundation (NRF) Oppenheimer Memorial Trust Royal Society, United Kingdom Sasol Technology South African Biosystematics Initiative (SABI) South African National Antarctic Program (SANAP) Stellenbosch University (SU) Table Mountain Fund Thuthuka Water Research Commission (WRC) Working for Water (WfW) Programme



Mathematics, Applied Mathematics, Computer Science

Contact details

Tel 021 808 3282 Fax 021 808 3823 E-mail rewitzky@sun.ac.za Web mathsci@sun.ac.za

Applied Mathematics http://dip.sun.ac.za Computer Science http://cs.sun.ac.za Mathematics http://maths.sun.ac.za

Research interests

Algebra and number theory; analysis, topology and category theory; approximation theory, computational mathematics, numerical analysis and scientific computing; discrete mathematics; financial mathematics; mathematical and computational biology; machine learning and computer vision; IP networks; automata theory and formal languages; program verification; flow modelling in porous media; software engineering.

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, the strengthening of collaborations with internationally recognised researchers at leading research institutions and the industry.

Two new professors in the Department showcased their research at their inaugural lectures. Prof Florian Breuer presented his lecture titled "The Parallel Worlds of Number Theory" on 15 August, and Prof Mapundi Banda presented his lecture titled "Doing the Maths of fluid flow networks" on 10 October.

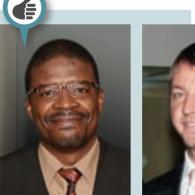
Many of our academic staff made short research visits abroad while four of our active researchers were fortunate to take longer research leave.

After a dedicated three-year term as the convenor of the Engineering Mathematics Module, Prof Sonja Mouton enjoyed a well-deserved six-month research sabbatical. In addition to making progress with two projects, she participated in the Positivity VII Congress in Leiden (Netherlands); and the Banach Algebras and Applications Congress in Gothenburg (Sweden).

Dr Bruce Bartlett spent a productive research sabbatical in the UK, visiting the University of Sheffield and the University of Oxford. The latter visit led to a Research Fellowship in the newly established Quantum Mathematics and Computation research group of the Mathematical Institute at the University of Oxford.

During a full year research sabbatical, Dr Arnold Keet made significant progress on two substantial research problems and also spent time writing up his graduate course notes on algebraic number theory for publication as a graduate textbook.

Mr Jacques Swanepoel took research leave for the year to complete his doctoral research with the aim of submitting his thesis by the end of 2014.



Prof Mapundi Banda and Prof Florian Breuer delivered their inaugural lectures during 2013.

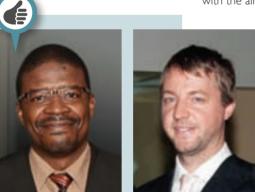
Researchers have also been recognised for their significant contributions to their respective specialist research areas through participation in joint publications. On invitation, Prof Helmut Prodinger has written a special chapter on Analytic Combinatorics for a book edited by the American mathematician Miklos Bona and due to appear in 2014.

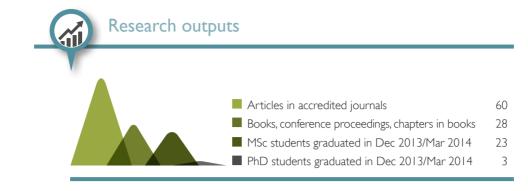
Prof André Weideman completed a major survey paper of nearly 70 pages, titled "The Exponentially Convergent Trapezoidal Rule", with Prof Nick Trefethen (Oxford University) for publication in SIAM Reviews. In this paper the mathematics and history of this phenomenon are reviewed and it is shown that far from being a curiosity, it is linked with computational methods across all scientific computing.

Prof Lynette van Zijl and Prof Jaco Geldenhuys contributed a chapter titled "Symmetric Difference NFAs: State of the Art" in the book Formal Aspects

of Computing edited by S Gruner and B Watson, published by Shaker Verlag in 2013. This chapter provides a complete survey of the field of symmetric difference automata. Special attention is paid to the case of unary automata.

One of Prof Marcel Wild's Mathematica algorithms has inspired an implementation in the programming language C++ by Prof Mohammed Zaki for application to real world problems in frequent set mining (a prominent field of data mining).





Academic affairs

We remain dedicated to promote teaching and learning for all undergraduate students taking modules in mathematical sciences. This includes appropriate support which caters for the range of abilities and interests of students in mathematics, applied mathematics and computer science.

In order to enrich those undergraduate students with a special enthusiasm for Mathematics, Applied Mathematics and Computer Science, we presented an undergraduate seminar series in each discipline. All the Computer Science seminars, organised by Prof Lynette van Zijl, will be opened to all undergraduate students on campus from 2014 onwards.

Enhancement lectures with online courses or resources have been investigated and implemented by several lecturers. This includes the use of MIT Open Courseware system as part of Dr Bruce Bartlett's teaching of the second year Analysis module in the Mathematics Division.

Participation of undergraduate students in national and international contests has been encouraged by Prof Stephan Wagner, Dr Steve Kroon and Dr Willie Brink. The students particularly enjoy the multi- and cross-disciplinary nature of the contests and did extremely well. In the Standard Bank IT Challenge, the Computer Science@Maties top team (Gerard Louw, Robert Ketteringham, Nikita Hiralal and Alex Wright) were placed second in South Africa. This team took the fourth place at the Association for Computing Machinery's (ACM) International Collegiate Programming Context (ICPC) Regionals in Sub-Saharan Africa.

A team of three of our third-year stars (Mark Chimes, Desislava Nikolov and Francois Koch van Niekerk) participated in the International Mathematics Competition (IMC) for university students that took place in Blagoevgrad (Bulgaria) from 6 to 11 August. It was the first time ever that South African universities (there were also two teams from UCT and Wits) participated with a full team in this event. Altogether, 321 students representing 72 universities from all over the world participated in the IMC. All three of our students earned themselves Honorable Mentions, definitely a worthwhile experience for our participants.

A total of 26 students (13 South African students and 13 students from Africa) in the Department were awarded PhD and Masters' degrees. These included three PhDs in Mathematics, four MSc degrees (cum laude) in Applied Mathematics, three MSc degrees (cum laude) in Computer Science, nine MSc degrees (cum laude) in Mathematics, one MSc degree in Applied Mathematics, two MSc degrees in Computer Science and four MSc degrees in Mathematics. Among those graduating with an MSc in Computer Science (cum laude) was Mr Willem Bester.

About 20 Honours students graduate from our Department annually. Most of these students take up employment offers at South African financial institutions, IT companies and research and development institutes such as the Council for Scientific and Industrial Research (CSIR). It remains a challenge for all three divisions to attract more South African students to pursue (either full-time or part-time) masters' and doctoral studies.

Service to the scientific community

The international biennial Conference on Arithmetic Geometry, organised by Prof Florian Breuer and Prof Barry Green, was hosted by the Mathematics Division. Seventeen international visitors from France, Germany, Japan, Madagascar, the Netherlands, Switzerland, UK and the USA attended.

The 37th annual South African Symposium on Numerical Analysis and Applied Mathematics was hosted by the Applied Mathematics Division. Invited speakers included Prof Mark

DEPARTMENT OF MATHEMATICAL SCIENCES

Ablowitz (University of Colorado), Prof Jean-Paul Berrut (University of Fribourg), Prof Susanne Brenner (Louisiana State University), Prof Bengt Fornberg (University of Colorado), Prof Jan Nordström (Linköping University), Prof Jie Shen (Purdue University), Prof Alastair Spence (University of Bath). A special session was devoted to the 60th birthday celebrations of Prof Ben Herbst from the Applied Mathematics Division.

The Southern Africa Mathematical Sciences Association (SAMSA) conference was held in Stellenbosch. It was co-hosted by the University of Cape Town, University of Stellenbosch, University of Western Cape and the Cape Peninsula University of Technology. The theme for the conference was "Capacity building in the Mathematical Sciences: prospects, successes and challenges in the Southern African context".

An annual forum, the International Conference on Logic for Programming, Artificial Intelligence and Reasoning (LPAR), was held in Stellenbosch. Leading researchers from all over the world presented new results and discussed advances in the areas of automated reasoning, computational logic, programming languages and their applications. Prof Bernd Fischer was the general chair together with Prof Geoff Sutcliffe (University of Miami).

The first Workshop on Mathematical Structures was organised by Prof Ingrid Rewitzky and Dr Zurab Janelidze. This was the first of a series of workshops to be organised by the Centre for Mathematical Structures that is being established in the Department of Mathematical Sciences. The aim is to exhibit the role of different types of mathematical structures across various fields in mathematics, computer science, physics, biology and other disciplines. The theme of the first workshop was "Ordered sets in computer science and homological algebra". It was hosted by Stellenbosch University together with the African Institute for Mathematical Sciences (AIMS) and attracted 30 participants. The workshop included invited talks, intensive courses and research activities such as discussions and presentations. For student participants, this served as preparation for further postgraduate study in an area closely related to the theme of the workshop. Researchers participating in the workshop had an opportunity to explore new links between different research areas.

A workshop on graph theory was organised by Prof Stephan Wagner and Prof Peter Dankelmann (University of Johannesburg) at AIMS. Although the focus was on joint work on different research problems, there were also research talks, aimed at postgraduate students.

Dr Sonia Woudberg, treasurer of the Southern African Society of Rheology (SASOR) for the period 2012 to 2014, was the main organiser of the SASOR short course held at the Plastics Federation in Midrand.

Awards to staff and students

At the Rector's Dinner for Top-Performing Students, hosted by the First-year Academy, 30 top-performing first-years of 2012 were honoured. Special recognition was also given to the lecturers who contributed most to their academic success, according to these students. Of the nine lecturers from the Faculty of Science honoured at the evening, four were from the Department of Mathematical Sciences, namely Dr Arnold Muller; Ms Bessie Burger; Prof Florian Breuer and Prof Johan de Villiers.

Prof Florian Breuer received a Faculty of Science research incentive award for his paper "Special subvarieties of Drinfeld modular varieties" appearing in the *Journal Für Die Reine und Angewandte Mathematik*. This journal is ranked as being in the top 10% of Mathematics journals based on article impact score using the Science Citation Index , the latter being the criteria used for the faculty's incentive scheme.

Prof Helmut Prodinger and Prof Stephan Wagner were among the 39 SU staff members who were rewarded for excellent research by the Vice-rector: Research and Innovation. They were among the 11 of these researchers who made the biggest contribution in terms of the publication units of the Department of Higher Education and Training; and who produced the highest number of accredited research publications in collaboration with their national and international research partners and students. The adjudication was based on the accredited publications of 2011.

Mr Jan Buys received the Stellenbosch University's Medal for the Best Masters Student in the Faculty of Science in 2013. His thesis, titled "Chorale Harmonization with Weighted Finite-state Transducers", was completed under the supervision of Prof Brink van der Merwe in the research area of Natural Language Processing. He is pursuing his doctoral research in Machine Learning and Computer Linguistics at the University of Oxford under the supervision of Dr Phil Blunsom.



The Stellenbosch University's Medal for the Best Masters Student in the Faculty of Science in 2013 was awarded to **Mr Jan Buys.**

Every August the Department of Science and Technology (DST) hosts the South African Women in Science Awards (WISA) to recognise and reward the achievements of women scientists and researchers in South Africa. Computer Science masters' student, Ms Heila-Marié van der Merwe, was awarded a Tata scholarship for a Master's degree. Heila obtained her BSc degree (2010) and BScHons degree (2011) in Computer Science (cum laude) from Stellenbosch University. In 2012 she started studying towards a MSc in Computer Science. Her research focuses on deriving a way in which to detect errors and security and energy problems in Android mobile applications. Wanting to continue with a PhD, she also strives to become a successful researcher in her field, not only to further basic academic and applied research, but also to encourage other women to pursue academic excellence.

Mr Dirk Brand, an Honours student in Computer Science, presented his research project prepared under the supervision of Dr Steve Kroon at the South African Postgraduate Student Symposium for the Natural Sciences at the University of Pretoria. He won the second prize in the Physics, Mathematics, Statistics, and Information Technology stream. In his project, Dirk used artificial intelligence techniques to construct a computer player for the board game "Risk".

Staff matters

During the year the ad hominem promotion of several staff members were approved with effect from 1 January 2014. In Mathematics, Prof Stephan Wagner and Dr Zurab Janelidze were promoted to full Professor and Associate Professor. In Computer Science, Prof Lynette van Zijl was promoted to full Professor and Dr Jaco Geldenhuys to Associate Professor.

Prof Bernd Fischer took up the position of Associate Professor in February 2013 in Computer Science. His expertise strengthened the System Software Verification research group. He was promoted to full Professor from 1 January 2014. In Mathematics, Dr Gareth Boxall and Dr Dimbinaina Ralaivaosaona took up lectureships in April 2013 and July 2013, respectively. Dr Boxall's research expertise lies in Model Theory and Logic, and Dr Ralaivaosaona's in Probabilistic Combinatorics.

Prof Francois Smit was appointed for a second two-year term (2014-2015) as the Applied Mathematics Division Head, and Prof Lynette van Zijl was appointed the Computer Science Division Head for a two-year period (2014-2015).

Dr McElory Hoffman resigned in September after 15 years of service to the university to devote his time and energy to a business venture in machine learning.

Dr Bruce Bartlett has been granted unpaid leave to take up a two-year research fellowship at the University of Oxford in the Quantum Mathematics and Computation research group at the Mathematical Institute.

Three vacancies in the Department were filled with appointments of upcoming young academics. In Computer Science, Mr Willem Bester was appointed Junior Lecturer in January 2014 and will strengthen the System Software Verification research group. In Mathematics, Dr James Gray was appointed as Lecturer in February 2014. He will be part of the research focus on Foundations of Mathematics, in particular, categorical algebra.

Community service

The first Computer Science@Maties Career Day was hosted on 22 August on campus. Companies regularly contact the Computer Science division in connection with job opportunities for Computer Science students who are about to finish their studies. The event had the format of an open day where the various companies set up branded stations with representatives who were ready to talk to the students who attended the event. Nineteen companies took part in the event and the student turnout was excellent. Given the positive feedback from all participants we plan to make this an annual event.

Our department offered training sessions for the Boland teams participating in the Southern African Interprovincial Mathematics Olympiad. Both the junior (Grades 8 and 9) and the senior (Grades 10 to 12) section were won by the Western Province A teams this year. The Boland A teams came 8th out of 28 teams (Juniors) and 10th out of 28 teams (Seniors) respectively.

More than 180 students from 10 different universities participated in the second edition of the South African Tertiary Mathematics Olympiad. Prof Stephan Wagner was part of the organising and problem selection committee. The competition turned into a triumph for UCT, who occupied the first five places. However, Stellenbosch students also did well, with



Ms Heila-Marié van der Merwe was awarded a Tata scholarship for an MSc in Computer Science.



Prof Stephan Wagner with two learners from Limpopo during the South African Maths Foundation's learner development camp, held at Stellenbosch University.

four of them in shared sixth place and four more among the top 20.

More than 70 high school learners from South Africa, Zimbabwe, Nigeria and Tunisia

participated in the South African Maths Foundation's learner development camp. Hosted by the Mathematics Division, the aim of the camp was to prepare some of the brightest young minds in the country for the 55th International Mathematics Olympiad that will take place from 3 to 13 July 2014 in Cape Town.

Biweekly Olympiad training classes were offered as part of the nationwide Siyangoba project. Mr Pieter Maritz was the coordinator and the classes were offered by Ms Melissa Kistner (masters' student in engineering; juniors) and Prof Stephan Wagner (seniors).

Dr Hardus Diedericks and Prof Francois Smit presented a two-day workshop on numerical modelling at the eThekwini Municipality.

Dr Sonia Woudberg was invited as guest speaker at the academic awards evening at Tygerberg High School, from where she matriculated. She was also invited to speak to the new Grade 8 learners during the school's information

evening, and was part of a video of the school's alumni to attract and inspire newcomers to the school.

Prof Florian Breuer's panoramic and surreal photograph of quiver trees and the Milky Way was shortlisted in the open category for the World Photography Awards. With over 122 000 entries from 170 countries, the World Photography Awards is one of the world's leading global photographic awards programmes.

NRF-rated researchers

Leading international researcher Prof Helmut Prodinger (analysis of algorithms, number theory and combinatorics)

Internationally acclaimed researcher Prof Ben Herbst (computer vision and machine learning) | Prof Leon van Wyk (ring theory and matrix algebras) | Prof Willem Visser (software failure, software engineering and software development) | Prof André Weideman (numerical analysis and scientific computation)

Established researcher Prof MK Banda (numerical methods for flow and transport processes) | Prof B Fischer (software engineering) | Dr Jaco Geldenhuys (software engineering, specifically model checking and process algebra) | Dr Sonja Mouton (banach algebras and spectral theory) Dr F 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 assistive technologies)

Promising young researcher Prof Florian Breuer (number theory) | Dr Zurab Janelidze (category theory and universal algebra) | Prof Stephan Wagner (combinatorics and graph theory)

Staff

Academic

Prof IM Rewitzky* Prof MK Banda Dr B Bartlett DR G Boxall Prof F Breuer Dr WH Brink El Burger Dr | Coetzer Dr GH Diedericks Prof B Fischer Prof A Fransman Dr | Geldenhuys I Govender Prof BW Green Dr PIP Grobler Prof J Hargrove HA Haroldt Prof BM Herbst Dr M Hoffman

Dr K-T Howell Dr CP Inggs Dr Z |anelidze Dr AP Keet Dr RS Kroon Dr MF Maritz Prof S Mouton Dr MA Muller Dr NL Muller Dr CG Naude Dr F Nyabadza Dr P Ouwehand Prof H Prodinger Dr N Ralaivaosaona Prof GIF Smit IP Swanepoel Prof AB van der Merwe Dr S van der Walt Prof L van Wyk Prof L van Zijl

Prof W Visser Prof S Wagner Prof JAC Weideman LK Wessels Prof M Wild Dr S Woudberg

* Executive head

Extraordinary

professors Prof IM de Villiers Prof MB Dwver ProfT Krzesinski Prof HF Porst Prof |W Sanders

Extraordinary associate

professors Prof K Scheffler Prof A Welte

Extraordinary senior lecturer Dr R Ghomrasni

Extraordinary lecturer Dr R Ouifki

Support staff

A Adams I Adams W Bester W Isaacs B lacobs OM Marais MM Rhoda AL Roman D Stephanus M van Niekerk

Collaboration and Funding

COLLABORATION South Africa

African Institute for Mathematical Sciences (AIMS) Council for Scientific and Industrial Research (CSIR) Denel Gensec Asset Management iThemba Labs Nelson Mandela Metropolitan University Reutech Radar Systems Rheinmetall Denel Munition (Pty) Ltd SASOL University of Pretoria University of the Witwatersrand

Africa National University of Science and Technology (Zimbabwe) Université d'Antananarivo (Madagascar) University of Botswana (Botswana)

International

Argentina Instituto Technológico de Buenos Aries (ITBA)

Australia University of Melbourne

Austria Alpen Adria Universität Klagenfurt Graz University of Technology Vienna University of Technology

Belgium Université catholique de Louvain

Germany University of Kassel University of Tübingen Technische Universität Berlin

Hungary Hungarian Academy of Sciences University of Miskolc

Ireland

Trinity College Dublin Mexico Universidad Nacional Autónoma de México

Poland

National Institute of Telecommunications University of Warsaw

Portugal Centre for Mathematics University of Coimbra

Romania University of Bucharest

Russia Joint Institute for Nuclear Research (JINR) Moscow State Pedagogical University

Serbia University of Kragujevac University of Novi Sad

Switzerland ETH Zürich

United Kingdom University of Birmingham University of Southampton

United States of America

Georgia Southern University NASA Ames Research Centre Texas A&M International University University of Colorado Boulder University of Nebraska-Lincoln

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AARDWETENSKAPPE • EARTH SCIENCES

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

ALDRIDGE RJ, MURDOCK DJE, GABBOTT SE, THERON JN. A 17-Element condont apparatus from the Soom Shale Lagerstätte (Upper

Ordovovician), South Africa. Palaeontology 2013; **56**(2): 261-276. **CHALAPATHI RAO NV, LEHMANN B, BELOUSOVA E, FREI D, MAINKAR D**. Petrology, Bulk-Rock Geochemistry, Indicator Mineral Composition and Zircon U-Pb Geochronology of the End-Cretaceous Diamondiferous Mainpur Orangeites, Bastar Craton, Central India. *Journal of the Geological Society of India* 2013;

I : 93-121. CLEMENS JD, ELBURG MA. Comment – Origin of enclaves in S-type granites of the Lachlan Fold Belt. *Lithos* 2013: **175-176** : 351-352.

DECOU A, VON EYNATTEN H, DUNKL I, FREI D, WÖRNER G. Late Eocene to Early Miocene Andean uplift inferred from detrital zircon fission track and U-Pb dating of Cenozoic forearc sediments (15-18°S). *Journal of South American Earth Sciences* 2013: **45** : 6-23.

FIETZ S, HUGUET C, RUEDA G, HAMBACH B, ROSELL-MELÉ A.

Hydroxylated isoprenoidal GDGTs in the Nordic Seas. Marine Chemistry 2013; **152**: 1-10. **FIETZ S, PRAHL FG, MORALEDA N, ROSELL-MELÉ A**. Eolian transport of glycerol dialkyl glycerol tetraethers(GDGTs) off northwest Africa. Organic Geochemistry 2013; **64**: 112-118.

HAIDER VL, DUNKL I, VON EYNATTEN H, DING L, FREI D,

ZHANG L. Cretaceous to Cenozoic evolution of the northern Lhasa Terrane and the Early Paleogene development of peneplains at Nam. Co, Tibertan Plateau. *Journal of Asian Earth Sciences* 2013; **70** : 79-98.

HAJNÁ J, ZÁK J, KACHLÍK V, DÖRR W, GERDES A. Neoproterozoic to early Cambrian Franciscan-type mélanges in the Teplá-Barrandian unit, Bohemian Massif: Evidence of modern-style accretionary processes along the Cadomian active margin of Gondwana:. *Precambrian Research* 2013; **224** : 653-670.

HETZEL R, DUNKL I, HAIDER V, STROBL M, VON EYNATTEN H, DING L, FREI D. Peneplain formation in southern Tibet predates the India-Asia collision and plateau uplift. *Geology* 2013; 41 : 297-298.

HUGUET C, FIETZ S, ROSELL-MELÉ A. Global distribution patterns of hydroxyl glycerol dialkyl glycerol tetraethers. Organic Geochemistry 2013; 57 : 107-118. KAUR P, ZEH A, CHAUDHRI N, GERDES A, OKRUSCH M. Nature of magmatism and sedimentation at a Columbia active margin: Insights from combined U-Pb and Lu-Hf isotope data of detrital zircons from NW India. Gondwana Research 2013; 23 : 1040-1052.

KÖKSAL S, TOKSOY-KÖLSA; F, GÖNCÜOGLU MC, MÖLLER A, GERDES A, FREI D. 3.8 Ga zircons sampled by Neogene ignimbrite eruptions in Central Anatolia. *Geology* 2013; **41** : 307.

KÖKSAL S, TOKSÖY-KÖLSA; F, GÖNCÜOGLU MC, MÖLLER A, GERDES A, FREI D. Crustal source of the Late Cretaceous Satansari monzonite stock (central Anatolia – Turkey) and its significance for the Alpine geodynamic evolution. Journal of Geodynamics 2013; 65: 82-93.

LAURIE A, STEVENS G, VAN HUNEN J. The end of continental growth by TTG magmatism. *Terra Nova* 2013; 25: 130-136.

MACEY PH, MILLER JA, ROWE CD, GRANTHAM GH, SIEGFRIED P, ARMSTRONG RA, KEMP J, BACALAU J. Geology of the Monapo Klippe, NE Mozambique and its significance for assembly of central Gondwana. *Precambrian Research* 2013; 233 : 259-281.

MELLETON J, GLOAGUEN E, FREI D, NOVÁK M, BREITER K. How are the emplacement of rare-element pegmatites, regional metamorphism interrelated in the Moldanubian Doman of the Variscan Boehemian Massif, Czech Republic? *Canadian Mineralogist* 2012; **50** : 1751-1773.

MILLER JA, FABER C, ROWE CD, MACEY PH, DU PLESSIS A. Eastward transport of the Monapo Klippe, Mozambique determined from field kinematics and computed tomography and implications for late tectonics in central Gondwana. *Precambrian Research* 2013; **237** : 101-115.

MILLONIG LJ, GERDES A, GROAT LA. The effect of amphibolite facies metamorphism on the U-Th-Pb geochronology of accessory minerals from metacarbonatites and associated meta-alkaline rocks. *Chemical Geology* 2013; **353** : 199-209. MOLONEY CL, FENNESSY ST, GIBBONS MJ, ROYCHOUDHURY AN, SHILLINGTON FA, VON DER HEYDEN BP, WATERMEYER K. Reviewing evidence of marine ecosystem change off South Africa. *African Journal of Marine Science* 2013; **35**(3) : 427-448.

NILSSON MKM, KLAUSEN MB, SÖDERLUND U, ERNST RE. Precise U-Pb ages and geochemistry of Palaeoproterozoic mafic dykes from southern West Greenland: Linking the North Atlantic and the Dharwar cratons. *Lithos* 2013; **174** : 255-270. **PHILANDER C, ROZENDAAL A**. The application of a novel geometallurgical

template model to characterise the Namakwa Sands heavy mineral deposit, West Coast of South Africa. *Minerals Engineering* 2013; **52** : 82-94.

ROMANO R, LANA C, ALKMIM FF, STEVENS G, ARMSTRONG RA. Stabilization of the southern portion of the Sâo Francisco craton, SE Brazil, through a long-lived period of potassic magmatism. *Precambrian Research* 2013; **224** : 143-159. ROYCHOUDHURY AN, COWAN D, PORTER D, VALVERDE

 A. Dissimilatory sulphate reduction in hypersaline coastal pans: an integrated microbiological and geochemical study. *Geobiology* 2013; 11: 224-233.
 ROZENDAAL A, HORN RG. Textural, mineralogical and chemical characteristics of copper reverb furnace smelter slag of the Okiep Copper District, South Africa. *Minerals Engineering* 2013; 52: 184-190. SMITH M, ROYCHOUDHURY AN. Mobilisation of Iron from rocks in a fractured aquifer: Lithological and geochemical controls. Applied Geochemistry 2013; 31 : 171-186. SZILAS K, VAN HINSBERG V, KISTERS AFM, HOFFMANN JE, WINDLEY BF, KOKFELT TF, SCHERSTÉN A, FREI R, ROSING MT, MÜNKER C. Remnants of arc-related Mesoarchaean oceanic crust in the Tartoq Group of SW Greenland. Gondwana Research 2013; 23 : 436-451.

TICHOMIROWA M, WHITEHOUSE MJ, GERDES A, GÖTZE J, SCHULZ B, BELYATSKY BV. Different zircon recrystallization types in carbonatites caused by magma mixing: Evidence from U-Pb dating, trace element and isotope composition (Hf and O) of zircons from two Precambrian carbonatites from Fennoscandia. *Chemical Geology* 2013; **353** : 173-198.

TREASURE AM, MOLONEY C, BESTER MN, MCQUAID CD, FINDLAY KP, BEST PB, COWAN DA, DE BRUYN PJN, DORRINGTON RA, FAGERENG A, FRONEMAN PW, GRANTHAM GH, HUNT BPV, MEIKLEJOHN KI, PAKHOMOV E, ROYCHOUDHURY AN, RYAN PG, SMITH VR, CHOWN SL,

ANSORGE IJ. South African research in the Southern Ocean: New opportunities but serious challenges. South African Journal of Science 2013; 109(3/4) : 1-4. WILLNER AP, BARR SM, GERDES A, MASSONNE HJ, WHITE CE.

Origin and evolution of Avalonia: evidence from U-Pb and Lu-Hf isotopes in zircon from the Mira terrane, Canada, and the Stavelot-Venn Massif, Belguim. *Journal of the Geological Society* 2013; **170** : 769-784.

WOTZLAW J-F, SCHALTEGGER U, FRICK DA, DUNGAN MA, GERDES A, GÜNTHER D. Tracking the evolution of large-volume silicic magma reservoirs from assembly to supereruption. *Geology* 2013; **41**(8) : 867-870. ZLATKIN O, AVIGAD D, GERDES A. Evolution and provenance of Neoproterozoic basement and Lower Paleozoic siliciclastic cover of the Menderes Massif (western Taurides): Coupled U-Pb-Hf zircon isotope geochemistry. *Gondwana Research* 2013; **23** : 682-700.

Tydskrifartikels (ongesubsidieer) | Journal Articles (non-subsidised)

HEINRICHS T, SIEGESMUND S, FREI D, DROBE M, SCHULZ B. Provenance signatures from whole-rock geochemistry and detrital zircon ages of metasediments from The Austroalpine Basement South of the Tauern Window (Eastern Tyrol, Austria). Geo-Alp 2013; **9**: 156-185.

PHILLIPS GN, CLEMENS JD. Strathbogie batholith: field-based subdivision of a large granitic intrusion in central Victoria, Australia. Applied Earth Science (Trans. Inst. Min. Metall. B) 2013; 122: 36-55.

PHILLIPS GN. Witwatersrand gold: discovery matters. Applied Earth Science(Trans. Inst. Min.Metall.B) 2013; 122(2): 122-127.

Verrigtinge internasionaal | Proceedings international

RUDNICK T, ROZENDAAL A. Genesis of the stratiform BH-t Swartberg Cu-Pb-Zn-Ag deposit, Northern Cape, South Africa. 12th Biennial SGA Meeting, UPPSALA UN, UPPSALA, Sweden, s 2013: 671-674.

Doktoraal afgehandel | Doctoral completed

LAURIE A. An experimental investigation of the water fluxed partial melting of eclogite to produce Earth's early felsic continental crust. PhD, 2013. 60 pp. Promotor: Stevens G. **VON DER HEYDEN BP**. Distribution and characterization of marine iron-rich particles. PhD, 2013. 157 pp. Promotor: Roychoudhury AN. Medepromotor: Myneni SCB.

BIOCHEMIE • BIOCHEMISTRY

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

AFRICANDER D, LOUW R, HAPGOOD JP. Investigating the antimineralocorticoid properties of synthetic progestins used in hormone therapy. *Biochemical and Biophysical Research Communications* 2013; **433** : 305-310.

ALBERTS P, KIDD M, STANDER MA, NIEUWOUDT HH, TREDOUX AGJ, DE VILLIERS AJ. Quantitative survey of 3-alkyl-2-methoxypyrazines and first confirmation of 3-ethyl-2-methoxypyrazine in South African Sauvignon blanc wines. South African Journal of Enology and Viticulture 2013; 34(1):54-67.

AUDOUIN M, PREISER R, NIENABER S, DOWNSBOROUGH L, LANZ J, MAVENGAHAMA S. Exploring the implications of critical complexity for the study of social-ecological systems. *Ecology and Society* 2013; 18(3) :Art.#12. BLOEM LM, STORBECK K-H, SCHLOMS L, SWART AC.

IIB-Hydroxyandrostenedione returns to the steroid arena: Biosynthesis, metabolism and function. *Molecules* 2013; **18** : 13228-13244.

BURGER H-M, SHEPHARD GS, LOUW W, RHEEDER JP,

GELDERBLOM WCA. The mycotoxin distribution in maize milling fractions under experimental conditions. International Journal of Food Microbiology 2013; 165 : 57-64. CILLIERS FP, BIGGS HC, BLIGNAUT S, CHOLES AG, HOFMEYR J-HS, JEWITT GPW, ROUX DJ. Complexity, modeling, and natural resource management. Ecology and Society 2013; 18(3) : 1.

DE VILLIERS M, MACUAMULE C, SPRY C, HYUN Y-M, STRAUSS E, SALIBA KJ. Structural modification of pantothenamides counteracts degradation by pantetheinase and improves antiplasmodial activity. ACS Medicinal Chemistry Letters 2013; **4** : 784-789.

DE VILLIERS MJ, PIRIE MD, HUGHES M, MÖLLER M, EDWARDS TJ, BELLSTEDT DU. An approach to identify putative hybrids in the 'coalescent stochasticity zone', as exemplified in the African plant genus *Streptocarpus* (Gesneriaceae). *New Phytologist* 2013; **198** : 284-300.

DU PLESSIS DM, BOTES M, DICKS LMT, CLOETE TE. Immobilization of commercial hydrolytic enzymes on poly (acrylonitrile) nanofibers for anti-biofilm activity. *Journal of Chemical Technology and Biotechnology* 2013; **88**(4) : 585-593.

GEENEN S, DU PREEZ F, SNOEP JL, FOSTER AJ, SARDA S, KENNA JG, WILSON ID, WESTERHOFF HV. Glutathione metabolism modeling: A mechanism for liver drug-robustness and a new biomarker strategy. *Biochimica et Biophysica Acta-General Subjects* 2013; **1830** : 4943-4959.

GOÓSEN P, SWART AC, STORBECK K-H, SWART P.Allosteric interaction between 3B-hydroxysteroid dehydrogenase/ 5-54 isomerase and cytochrome b₁ influences cofactor binding. Faseb Journal 2013; 27 : 322-332. HOFMEYR J-HS, GQWAKA OPC, ROHWER JM.A generic rate equation

for catalysed, template-directed polymerisation. *Febs Letters* 2013; **587** : 2868-2875. HOUGH D, CLOETE SWP, STORBECK K-H, SWART AC, SWART

P. Cortisol production in sheep is influenced by the functional expression of two cytochrome P450 17 - hydroxylase/17,20-lyase (CYP17) isoforms. *Journal of Animal Science* 2013; **91** : 1193-1206.

KALILI KM, VESTNER J, STANDER MA, DE VILLIERS AJ. Toward unraveling grape tannin composition: Application of online hydrophilic interaction chromatography x reversed-phase liquid chromatography-time-of-flight mass spectrometry for grape seed analysis. Analytical Chemistry 2013; 85 : 9107-9115. KOURIL T, ESSER D, KORT J, WESTERHOFF H V, SIEBERS B, SNOEP JL. Intermediate instability at high temperature leads to low pathway

efficiency for an in vitro reconstituted system of gluconeogenesis in Sulfolobus solfataricus. Febs Journal 2013; **280** : 4666-4680.

KRITZINGER EC, STANDER MA, DU TOIT WJ. Assessment of glutathione levels in model solution and grape ferments supplemented with glutathione-enriched inactive dry yeast preparations using a novel UPLC-MS/MS method. Food Additives and Contaminants Part A-Chemistry Analysis Control Exposure & Risk Assessment 2013; **30**(1): 80-92.

LOMBARD MJ, STEYN N, BURGER H-M, CHARLTON K, SENEKAL M.A food photograph series for identifying portion sizes of culturally specific dishes in rural areas with high incidence of oesophageal cancer. *Nutrients* 2013; **5** : 3118-3130. LOUW A, JOUBERT E, VISSER K. Phytoestrogenic potential of *Cyclopia* extracts and polyphenols. *Planta Medica* 2013; **79** : 580-590.

MOLERO C, PETRÉNYI K, GONZÁLEZ A, CARMONA M, GELIS S, ABRIE JA, STRAUSS E, RAMOS J, DOMBRADI V, HIDALGO E, ARIÑO J. The Schizosaccharomyces pombe fusion gene hal3 encodes three distinct activities. Molecular Microbiology 2013; 90(2): 367-382.

MUNYUKI G, JACKSON GE, VENTER GA, KÖVÉR KE, SZILÁGYI L, RAUTENBACH M, SPATHELF B, BHATTACHARYA B, VAN DER SPOEL D. β-Sheet structures and dimer models of the two major tyrocidines, antimicrobial peptides from *Bacillus aneurinolyticus*. *Biochemistry* 2013; **52** : 7798-7806. NAIDOO VB, RAUTENBACH M. Self-assembling organo-peptide bolaphiles

with KLK tripeptide head groups display selective antibacterial activity. *Journal of Peptide Science* 2013; **19**:784-791. **PALM DC, ROHWER JM, HOFMEYR J-HS**. Regulation of glycogen synthase

from mammalian skeletal muscle – a unifying view of allosteric and covalent regulation. Febs Journal 2013; **280** : 2-27.

PILLAY CS, HOFMEYR J-HS, MASHAMAITE LN, ROHWER JM. From top-down to bottom-up: Computational modeling approaches for cellular redoxin networks. Antioxidants & Redox Signaling 2013; 18(16) : 2075-2086. QUINTON-TULLOCH MJ, BRUGGEMAN FJ, SNOEP JL,

WESTERHOFF HV. Trade-off of dynamic fragility but not of robustness in metabolic pathways *in silico. Febs Journal* 2013; **280** : 160-173.

ROBERTSON S, HAPGOOD JP, LOUW A. Glucocorticoid receptor concentration and the ability to dimerize influence nuclear translocation and distribution. *Steroids* 2013; **78** : 182-194.

ROBERTSON S, ROHWER JM, HAPGOOD JP, LOUW A. Impact of glucocorticoid receptor density on ligand-independent dimerization, cooperative ligand-binding and basal priming of transactivation: A cell culture model. *PLoS ONE* 2013; **8**(5) : e64831.

ROGERS KH, LUTON R, BIGGS H, BIGGS R, BLIGNAUT S, CHOLES AG, PALMER CG, TANGWE P. Fostering Complexity Thinking in Action Research for Change in Social–Ecological Systems. Ecology and Society 2013; 18(2) :Art#31. SHEPHARD GS, KIMANYA ME, KPODO KA, GNONLONFIN GJB, GELDERBLOM WCA. The risk management dilemma for fumonisin mycotoxins. Food Control 2013; 34 : 596-600.

SMIT AY, DU TOIT WJ, STANDER MA, DU TOIT M. Evaluating the influence of maceration practices on biogenic amine formation in wine. *LWT-Food Science and Technology* 2013; **53** : 297-307.

SPRY C, MACUAMULE C, LIN Z, VIRGA KG, LEE RE, STRAUSS E, SALIBA KJ. Pantothenamides are potent, on-target inhibitors of Plasmodium falciparum growth when serum pantetheinase is inactivated. PLoS ONE 2013;8(2) : e54974. STANDER MA, KÜHN W, HITEN NF. Survey of South African fruit juices using a fast screening HILIC-MS method. Food Additives and Contaminants Part A-Chemistry Analysis Control Exposure & Risk Assessment 2013; 30(9) : 1473-1484. STORBECK K-H, BLOEM LM, AFRICANDER D, SCHLOMS L, SWART P, SWART AC. I18-Hydroxydihydrotestosterone and 11-ketodihydrotestosterone, novel C19 steroids with androgenic activity: A putative role in castration resistant prostate cancer? Molecular and Celular Endocrinology 2013; 377 : 135-146. STORBECK K-H, SWART AC, GOOSEN P, SWART P. Cytochrome b,: Novel roles in steroidogenesis. *Molecular and Cellular Endocrinology* 2013; **371** : 87-99. SWART AC, BLOEM LM, SCHLOMS L, SWART P, AFRICANDER D, STORBECK K-H. 118-Hydroxyandrostenedione is metabolised to novel

androgenic C19 steroids in the prostate. International Journal of Molecular Medicine 2013; **32**(1):S21.

SWART AC, SCHLOMS L, STORBECK K-H, BLOEM LM, DU TOIT T, QUANSON JL, RAINEY WE, SWART P. 11B-Hydroxyandrostenedione, the product of androstenedione metabolism in the adrenal, is metabolized in LNCaP cells by 5B-reductase yielding 11B-hydroxy-5B-androstanedione. *Journal of Steroid Biochemistry and Molecular Biology* 2013; **138** : 132-142.

SWART P, SWART AC, LOUW A, DE BOSSCHER K, HAEGEMAN G, BUDONOVA I. Anti-inflammatory and anti-cancer activities of compound A:A synthetic compound derived from a natural product. *International Journal of Molecular Medicine* 2013; **32**(1):S21.

VAN DER WESTHUIZEN L, SHEPHARD GS, GELDERBLOM WCA, TORRES O, RILEY RT. Fumonisin biomarkers in maize eaters and implications for human disease. World Mycotoxin Journal 2013; 6(3) : 223-232.

VISSER K, MORTIMER M, LÓUW A. Cyclopia extracts act as ER antagonists and ERß agonists, in vitro and in vivo. PLoS ONE 2013; 8(11) : e79223.

VOSLOO JA, STANDER MA, LEUSSA AN-N, SPATHELF B, RAUTENBACH M. Manipulation of the tyrothricin production profile of *Bacillus aneurinolyticus*. *Microbiology* 2013; **159** : 2200-2211.

WILLEMSE CM, STÄNDER MA, DE VILLIERS AJ. Hydrophilic interaction chromatographic analysis of anthocyanins. *Journal of Chromatography* A 2013; 1319: 127-140.

Tydskrifartikels (ongesubsidieer) | Journal Articles (non-subsidised)

HOUGH D, SWART P, CLOETE SWP. Exploration of the Hypothalamic-Pituitary-Adrenal Axis to Improve Animal Welfare by Means of Genetic Selection: Lessons from the South African Merino. *Animals* 2013; **3** : 442-474.

HOUGH D, SWART P, CLOETE SWP. Exploration of the hypothalamicpituitary-adrenal axis to improve animal welfare by means of genetic selection: Lessons from the South African Merino. *Animals* 2013; **3** : 442-474.

SCHEINPFLUG K, NIKOLENKO H, KOMAROV IV, RAUTENBACH M, DATHE M.What goes around comes around – A comparative study of the influence of chemical modifications on the antimicrobial properties of small cyclic peptides. *Pharmaceuticals* 2013; **6** : 1130-1144.

Verrigtinge internasionaal | Proceedings international

HOUGH D, SWART P, CLOETE JJE, CLOETE SWP. Searching for SNPs that affect sheep robustness: CYP17 SNP affects behavioural responses to psychological stress. Proceeding of the Association for the Advancement of Animal Breeding and Genetics, Massey University, Napier, New Zealand, AAABG Distribution Service 2013: 503-506.

Hoofstukke in boeke | Chapters in books

SNOEP JL. Databases for Kinetic Models. In *Encyclopedia of Systems Biology*, Springer, New York, USA, 2013: 537-544.

Doktoraal afgehandel | Doctoral completed

BURGER H-M. Altered lipid metabolism as a possible mechanism in fumonisin-induced hepatocarcinogenesis in rats and investigations into risk assessment in humans. PhD(Bioch), 2013. 353 pp. Promotor: Gelderblom WCA. Medepromotor: Swart P.

EICHER JJ. Understanding glycolysis in Escherichia coli:A systems approach using nuclear magnetic resonance spectroscopy. PhD(Bioch), 2013. 197 pp. Promotor: Rohwer IM. Medepromotor: Snoep IL.

LOUW R. A study of the molecular mechanism of progestin-induced regulation of IL-12 and IL-10 and implications for HIV pathogenesis. PhD(Bioch), 2013. 215 pp. Promotor: Africander D. Medepromotor: Hapgood JP.

MAGCWEBEBA T. Chemopreventive properties of South African herbal teas, Rooibos (Aspalathus linearis) and Honeybush (Cyclopia spp): Mechanism against skin carcinogenesis. PhD(Bioch), 2013. 269 pp. Promotor: Gelderblom WCA. Medepromotors: Joubert E, Swart P.

PALM DC. The regulatory design of glycogen metabolism in mammalian skeletal muscle. PhD(Bioch), 2013. 285 pp. Promotor: Hofmeyr J-HS. Medepromotor: Rohwer JM. PENKLER G. A kinetic model of glucose catabolism in Plasmodium falciparum. PhD(Bioch), 2013. 196 pp. Promotor: Snoep JL, Westerhoff HV. Medepromotor: Rautenbach M.

CHEMIE & POLIMEERWETENSKAP • CHEMISTRY & POLYMER SCIENCE

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

ALBERTS P, KIDD M, STANDER MA, NIEUWOUDT HH, TREDOUX AGJ, DE VILLIERS AJ. Quantitative survey of 3-alkyl-2-methoxypyrazines and first confirmation of 3-ethyl-2-methoxypyrazine in South African Sauvignon blanc wines. South African Journal of Enology and Viticulture 2013; 34(1) : 54-67. ALIWAINI S, SWARTS AJ, BLANCKENBERG A, MAPOLIE SF, PRINCE S.A novel binuclear palladacycle complex inhibits melanoma growth *in vitro* and *in vivo* through apoptosis and autophagy. Biochemical Pharmacology 2013; 86 : 1650-1663. Publikasielys | Publication list

AMER ISA, VAN REENEN AJ. Hydrogen effects in the polymerization of propylene with C₂ symmetric metallocene catalysts. *E-Polymers* 2013; **13**(1) : 285-292. **BELDJOUDI Y, HAYNES DA, HAYWARD JJ, MANNING WJ, PRATT DR, RAWSON JM**. Preparation and crystal structures of the isomeric

series 4-tolyl-1,2,3,5-dithiadiazolyl, (o-MeC, H_CNSSN), (m-MeC, H_CNSSN), and (p-MeC, H_CNSSN), CrystEngComm 2013; **15** : 1107-1113. **BLACKIE MAL**. Metal containing chloroquinolines: Beyond hit and miss antimalarial

efficacy to solid science. *Mini-Reviews in Medicinal Chemistry* 2013; **13**(4):597-606. **BOTHA L, VAN REENEN AJ**. The effect of in-process ethylene incorporation on the evolution of particle morphology and molecular characteristics of commercial heterophasic ethylene propylene copolymers (HEPCs). *European Polymer Journal* 2013; **49**:2202-2213.

CHERUTHAZHEKATT S, HARDING GW, PASCH H. Comprehensive high temperature two-dimensional liquid chromatography combined with high temperature gradient chromatography-infrared spectroscopy for the analysis of impact polypropylene copolymers. *Journal of Chromatography A* 2013; **1286** : 69-82. **CHERUTHAZHEKATT S, MAYO N, MONRABAL B, PASCH H**. Chemical

composition separation of EP copolymers by CEF and HT-SGIC: Crystallization versus adsorption. *Macromolecular Chemistry and Physics* 2013; 214 : 2165-2171. CHERUTHAZHEKATT S, PASCH H. Improved chemical composition

separation of ethylene–propylene random copolymers by high-temperature solvent gradient interaction chromatography. *Analytical and Bioanalytical Chemistry* 2013; **405**(26):8607-8614.

CHERUTHAZHEKATT S, PIJPERS TFJ, MATHOT VBF, PASCH H. Combination of TREF, high-temperature HPLC, FTIR and HPer DSC for the comprehensive analysis of complex polypropylene copolymers. *Analytical and Bioanalytical Chemistry* 2013; **405** : 8995-9007.

CHERUTHAZHEKATT S, ROBERTSON DD, BRAND M, VAN REENEN AJ, PASCH H. Solution crystallization and dissolution of polyolefins as monitored by a unique analytical tool: Solution crystallization analysis by laser light scattering. Analytical Chemistry 2013; 85:7019-7023.

CLOETE WJ, VERWEY L, KLUMPERMAN B. Permanently antimicrobial waterborne coatings based on the dual role of modified poly(styrene-co-maleic anhydride). *European Polymer Journal* 2013; **49** : 1080-1088.

COLQUHOUN H, KLUMPERMAN B. Self-healing polymers. Polymer Chemistry 2013; 4:4832-4833.

CRONJE L, KLUMPERMAN B. Modified electrospun polymer nanofibers as affinity membranes: The effect of pre-spinning modification versus post-spinning modification. *European Polymer Journal* 2013; **49** : 3814-3824.

CRONJE L, WARREN RM, KLUMPERMAN B. pH-Dependent adhesion of mycobacteria to surface-modified polymer nanofibers. *Journal of Materials Chemistry B* 2013; 1:6608-6618.

DAVIS JC, BUHL M, KOCH KR. Probing isotope shifts in ¹⁰³Rh and ¹⁹⁵Pt NMR spectra with density functional theory. *Journal of Physical Chemistry* A 2013; 117:8054-8064.

DE FREITAS JN, MAUBANE MS, BEPETE G, VAN OTTERLO WAL, COVILLE NJ, NOGUEIRA AF. Synthesis and characterization of single wall carbon nanotube-grafted poly(3-hexylthiophene) and their nanocomposites with gold nanoparticles. Synthetic Metals 2013; 176 : 55-64.

DILLEN J. Conformational analysis of azepane, oxepane, silepane, phosphepane, thiepane and the azepanium cation by high level quantum mechanics. *Structural Chemistry* 2013; **24**:751-762.

DILLEN J. Congested molecules. Where is the steric repulsion? An analysis of the electron density by the method of interacting quantum atoms. *International Journal of Quantum Chemistry* 2013; **113**: 2143-2153.

ESTERHUYSEN C, FRENKING G. Complexation behavior of two-coordinated carbon compounds containing fluorenyl ligands. *Dalton Transactions* 2013; **42** : 13349-13356. ETMIMI HM, MALLON PE, SANDERSON RD. Polymer/graphite

nanocomposites: Effect of reducing the functional groups of graphite oxide on water barrier properties. *European Polymer Journal* 2013; **49** : 3460-3470.

ETMIMI HM, MALLON PE. *In situ* exfoliation of graphite oxide nanosheets in polymer nanocomposites using mimiemulsion polymerization. *Polymer* 2013; **54** : 6078-6088.

FRANCO J, BLACKIE MAL, TOTH D, SMITH PJ, CAPUANO J, FASTNACHT K, BERKES C.A structural comparative approach to identifying novel antimalarial inhibitors. *Computational Biology and Chemistry* 2013; 45 : 42-47. GILDENHUYS J, LE ROEX T, EGAN TJ, DE VILLERS KA. The single crystal x-ray structure of beta-hematin DMSO solvate grown in the presence of chloroquine, a beta-hematin growth-rate inhibitor. *Journal of the American Chemical Society* 2013; 135 : 1037-1047.

GROBLER I, SMITH VJ, BHATT PM, HERBERT SA, BARBOUR LJ. Tunable anisotropic thermal expansion of a porous zinc(II) metal-organic framework. *Journal of the American Chemical Society* 2013; **135** : 6411-6414.

GROENEWALD F, MATEURA M, DILLEN JLM. A computational investigation of the effect of the double bond on the conformations of seven membered rings. *Structural Chemistry* 2013; **24** : 243-250.

GULE NP, DE KWAADSTENIET M, CLOETE TE, KLUMPERMAN B. Furanone-containing poly(vinyl alcohol) nanofibers for cell-adhesion inhibition. *Water Research* 2013; **47**: 1049-1059.

HAMANN AR, DE KOCK C, SMITH PJ, VAN OTTERLO WAL,

BLACKIE MAL. Synthesis of triazole-linked 2-trichloromethylquinazolines and exploration of their efficacy against P. *falciparum*. South African Journal of Chemistry-Suid-Afrikaanse Tydskrif Vir Chemie 2013; **66** : 231-236.

HEHN M, MAIKO KG, PASCH H, HILLER W. Online HPLC-NMR: An efficient method for the analysis of PMMA with respect to tacticity. *Macromolecules* 2013: **46** : 7678-7686.

HERBERT SA, CASTELL DC, CLAYDEN J, ARNOTT GE. Manipulating the diastereoselectivity of ortholithiation in planar chiral ferrocenes. *Organic Letters* 2013; **15**(13): 3334-3337.

HILLER W, VAN ASWEGEN W, HEHN M, PASCH H. Online ThFFF-NMR: A novel tool for molar mass and chemical composition analysis of complex macromolecules. *Macromolecules* 2013; **46** : 2544-2552.

HUSSAIN H, AL-HARRASI A, ABBAS G, REHMAN NU, MABOOD F, AHMED I, SALEEM M, VAN REE T, GREEN IR, ANWAR S, BADSHAH A, SHAH A, ALI I. The genus *Pluchea*: Phytochemistry, traditional

uses and biological activities. *Chemistry & Biodiversity* 2013; **10** : 1944-1971. **HUSSAIN H, GREEN IR, AHMED I**. Journey describing applications of oxone in synthetic chemistry. *Chemical Reviews* 2013; **113** : 3329-3371.

HUSSAIN H, GREEN IR, KROHN K, AHMED I. Advances in the total synthesis of biologically important callipeltosides: a review. *Natural Product Reports* 2013; **30** : 640-693.

HUSSAIN H, NYONGHA AT, DONGO E, BADSHAH A, GREEN IR, ZHANG W. Melicimides A and B:Two new ceramides form stem bark of *Melicia* excelsa. Records of Natural Products 2013;7(2):141-146.

JACOBS T, BARBOUR LJ. Single-crystal to single-crystal transformations in discrete solvated metallocycles: the role of the metal ion. *New Journal of Chemistry* 2013; **37** : 71-74.

JACOBS T, BARBOUR LJ. Solvent diffusion and binding in a 'nonporous' molecular crystal. *CrystEngComm* 2013; 15 : 1512-1514.

KALILI KM, DE VILLIERS AJ. Systematic optimisation and evaluation of online, off-line and stop-flow comprehensive hydrophilic interaction chromatography x reversed phase liquid chromatographic analysis of procyanidins. Part I: Theoretical considerations. Journal of Chromatography A 2013; **1289**: 58-68.

KALILI KM, DE VILLIERS AJ. Systematic optimisation and evaluation of online, off-line and stop-flow comprehensive hydrophilic interaction chromatography x reversed phase liquid chromatographic analysis of procyanidins. Part II:Application to cocoa procyanidins. Journal of Chromatography A 2013; **1289** : 69-79.

KALILI KM, VESTNER J, STANDER MA, DE VILLIERS AJ. Toward unraveling grape tannin composition: Application of online hydrophilic interaction chromatography x reversed-phase liquid chromatography-time-of-flight mass spectrometry for grape seed analysis. *Analytical Chemistry* 2013; **85** : 9107-9115.

KLEPAC D, Š□ETAR M, KUREK M, MALLON PE, LUYT AS, GALIĆ K, VALIĆ S. Oxygen permeability, electron spin resonance, differential scanning calorimetry and positron annihilation lifetime spectroscopy studies of uniaxially deformed linear low-density polyethylene film. *Polymer International* 2013; **62** : 474-481. **KOTZE IA, GERBER WJ, WU Y, KOCH KR**. Cation-pi induced aggregation of water-soluble [Pt^{II}(diimine)(Lⁿ-S,O)]⁺ complexes studied by ¹H DOSY NMR and TEM: from 'dimer aggregates' in acetonitrile to nano-aggregates ('metallogels') in

1EM: from 'dimer aggregates' in acetonitrile to nano-aggregates ('metallogels') in water. Dalton Transactions 2013; **42** : 3791-3801. **KRIEL H, SANDERSON RD, SMIT AE**. Single polymer composite yarns and

films prepared from heat bondable poly(lactic acid) core-shell fibres with submicron fibre diameters. Fibres & Textiles in Eastern Europe 2013; 21 (4 (100) : 44-47. KUMARI H, ERRA L, WEBB AC, BHATT PM, BARNES CL, DEAKYNE

CA, ADAMS JE, BARBOUR LJ, ATWOOD JL. Pyrogallol[4]arenes as frustrated organic solids. Journal of the American Chemical Society 2013; 135: 16963-16967. KUMARI H, GOOD AJ, SMITH VJ, BARBOUR LJ, DEAKYNE CA, ATWOOD JL. 18-Crown-6 templates offset-linked pyrogallol[4]arene dimers. Supramolecular Chemistry 2013; 25(9-11): 591-595.

KUMARI H, ZHANG J, ERRA L, BARBOUR LJ, DEAKYNE CA, ATWOOD JL. Cocrystals of gabapentin with C-alkylresorcin[4]arenes. CrystEngComm 2013; 15 :4045-4048.

LEMMERER A, ADSMOND DA, ESTERHUYSEN C, BERNSTEIN J. Polymorphic co-crystals from polymorphic co-crystal formers: Competition between carboxylic acid•••pyridine and phenol•••pyridine hydrogen bond. *Crystal Growth & Design* 2013; **13** : 3935-3952.

LOOTS L-A, BARBOUR LJ. An infinite catenane self-assembled by pi•••pi interactions. *Chemical Communications* 2013; 49:671-673.

LUSI M, BARBOUR LJ. Solid-vapour reactions as a post-synthetic modification tool for molecular crystals: the enclathration of benzene and toluene by Werner complexes. *Chemical Communications* 2013; **49** : 2634-2636.

MAIKO KG, HEHN M, HILLER W, PASCH H. Comprehensive twodimensional liquid chromatography of stereoregular poly(methyl methacrylates) for tacticity and molar mass analysis. *Analytical Chemistry* 2013; **85** : 9793-9798.

MAKAN AC, SINHA PP, NGAZA N, VAN ASWEGEN W, PASCH H. Asymmetrical flow field-flow fractionation as a novel technique for the analysis of PSb-PI copolymers. Analytical and Bioanalytical Chemistry 2013; **405** : 9041-9047.

MALINGA SP, AROTIBA OA, KRAUSE RWM, MAPOLIE SF, DIALLO MS, MAMBA BB. Cyclodextrin-dendrimer functionalized polysulfone membrane for the removal of humic acid in water. *Journal of Applied Polymer Science* 2013; 130 : 4428-4439.

MAMO MA, FREITAS FS, FORBES RP, BLACK RS, NOGUEIRA AF, VAN OTTERLO WAL, COVILLE NJ. Synthesis of C_{60} -containing polymers by ring-opening metathesis co-polymerization of a C_{60} -cyclopentadiene cycloadduct and N-(cycloheptyl)-endo-norbornene-5,6-dicarboximide and their application in a photovoltaic device. *Fullerenes Nanotubes and Carbon Nanostructures* 2013; **21**: 198-212. MAPOLIE SF, VAN WYK JL. Synthesis and characterization of dendritic salicylaldimine complexes of copper and cobalt and their use as catalyst precursors in the aerobic hydroxylation of phenol. *Inorganica Chimica Acta* 2013; **394** : 649-655.

MATSINHA LC, MALATJI P, HUTTON AT, VENTER GA, MAPOLIE SF, SMITH GS. Water-soluble half-sandwich Ru^{il}-arene complexes: Synthesis,

structure, electrochemistry, DFT studies, and aqueous phase hydroformylation of I-octene. European Journal of Inorganic Chemistry 2013; **2013**(24) : 4318-4328. **MATSINHA LC, MAPOLIE SF, SMITH GS**. Synthesis and characterization

of mono- and binuclear iminopyridyl and salicylaldimine Ru(II)-arene complexes. Polyhedron 2013; **53** : 56-61.

MITRA S, BURGER BV, PODDAR-SARKAR M. Headspace volatile oxylipins of Eastern Himalayan moss Cyathophorella adiantum extracted by sample enrichment probe. *Lipids* 2013; **48**(10) : 997-1004.

NAVARRETE P, PIZZI A, PASCH H, RODE K, DELMOTTE L. Characterization of two maritime pine tannins as wood adhesives. *Journal of Adhesion Science and Technology* 2013; **27**(22) : 2462-2479.

NAVARRETE P, PIZZI A, RODE K, VIGNALI M, PASCH H. MALDI-TOF study of oligomers distribution in spray-dried glyoxalated lignin for wood adhesives. Journal of Adhesion Science and Technology 2013; 27(5-6) : 586-597.

NDLOVU SS, VAN REENEN AJ, LUYT AS. LDPE-wood composites utilizing degraded LDPE as compatibilizer. Composites Part A-Applied Science and Manufacturing 2013; 51: 80-88.

NEPPALLI R, CAUSIN V, MARIGO A, MEINCKEN M, HARTMANN PC, VAN REENEN AJ. Effect of electrospun ethylene vinyl alcohol copolymer (EVOH) fibres on the structure, morphology, and properties of poly(lactic acid) (PLA). *Polymer* 2013: 54(21): 5909-5919.

NGODWANA L, KLEINHANS DJ, SMUTS A, VAN OTTERLO WAL, ARNOTT GE. Selective derivatisation of resorcinarene ethers via an ortholithiation approach. RSC Advances 2013; 3 : 3873-3876.

PASCH H, MALIK MI, MACKO T. Recent advances in high-temperature fractionation of polyolefins. *Advances in Polymer Science* 2013; **251** : 77-140. **PASCH H**. Hyphenated separation techniques for complex polymers. *Polymer Chemistry* 2013; **4** : 2628-2650.

PEPELS M, FILOT I, KLUMPERMAN B, GOOSSENS H. Self-healing systems based on disulfide-thiol exchange reactions. *Polymer Chemistry* 2013; **4** : 4955-4965. PFUKWA R, KOUWER PHJ, ROWAN AE, KLUMPERMAN B.

Templated hierarchical self-assembly of poly(p-aryltriazole) foldamers. Angewandte Chemie-International Edition 2013; **52** : 11040-11044.

PIZZI A, PASCH H, CELZARD A, SZCZUREK A. Oligomers distribution at the gel point of tannin-formaldehyde thermosetting adhesives for wood panels. *Journal of Adhesion Science and Technology* 2013; **27**(18-19) : 2094-2102.

RADEBE NM, RODE K, PIZZI A, GIOVANDO S, PASCH H. MALDI-TOF-CID for the microstructure elucidation of polymeric hydrolyasable tannins. *Journal of Applied Polymer Science* 2013; **128** : 97-107.

RADEBE NM, RODE K, PIZZI A, PASCH H. Microstructure elucidation of polyflavonoid tannins by MALDI-TOF-CID. Journal of Applied Polymer Science 2013; 127(3): 1937-1950.

RETIEF L, LUTZ M, POTGIETER M. The development and refinement of a questionnaire on the investigation of students' experience of first-year chemistry practicals. *South African Journal of Chemistry / Suid-Afrikaanse Tydskrif Vir Chemie* 2013; **66** : 282-284.

RETIEF L, POTGIETER M, LUTZ M. The usefulness of the Rasch Model for the refinement of Likert Scale questionnaires. *African Journal of Research in Mathematics, Science and Technology Education (AJRMSTE) or African Journal of Research in MST Education* 2013; **17**(1-2) : 126-139.

ROBINSON S, HAYNES DA, RAWSON JM. Co-crystal formation with 1,2,3,5-dithiadiazolyl radicals. *CrystEngComm* 2013; **15** : 10205-10211.

SADHUKHAN N, SARKAR M, GHATAK T, RAHAMAN SMW, BARBOUR LJ, BERA JK. Reactions of acids with naphthyridine-functionalized ferrocenes: Protonation and metal extrusion. *Inorganic Chemistry* 2013; 52 : 1432-1442. SCHNEIDER R, GOHLA A, SIMARD JR, YADAV DB, FANG Z, VAN

OTTERLO WAL, RAUH D. Overcoming compound fluorescence in the FLiK screening assay with red-shifted fluorophores. *Journal of the American Chemical Society* 2013; **135** : 8400-8408.

SEWBALAS A, ISLAM RUI, VAN OTTERLO WAL, DE KONING CB, SINGH M, ARBUTHNOT P, ARIATTI M. Enhancement of transfection activity in HEK293 cells by lipoplexes containing cholesterol nitrogen-pivoted azacrown ethers. *Medicinal Chemistry Research* 2013; 22 : 2561-2569. SHI Y, VAN DEN DUNGEN ETA, KLUMPERMAN B, VAN

NOSTRUM CF, HENNINK WE. Reversible addition-fragmentation chain transfer synthesis of a micelle-forming, structure reversible thermosensitive diblock copolymer based on N-(2-hydroxy propyl) methacrylamide backbone. ACS Macro Letters 2013; **2**:403-408.

SHUGMAN E, ALDRICH C, SANDERSON RD, MCLACHLAN DS. Infrasonic backpulsed membrane cleaning of micro- and ultrafiltration membranes

fouled with alumina and yeast. Water SA 2013; **39**(1) : 9-16. SPINA S, ZHOU X, SEGOVIA C, PIZZI A, ROMAGNOLI M,

GIOVANDO S, PASCH H, RODE K, DELMOTTE L. Phenolic resin

adhesives based on chestnut (*Castanea sativa*) hydrolysable tannins. *Journal of Adhesion* Science and Technology 2013; **27**(18-19) : 2103-2111.

STANIMIROVA^{II}, KAZURA M, DE BEER D, JOUBERT E, SCHULZE AE, BEELDERS T, DE VILLIERS AJ, WALCZAK B. High-dimensional

nested analysis of variance to assess the effect of production season, quality grade and steam pasteurization on the phenolic composition of fermented rooibos herbal tea.

Talanta 2013; 115 : 590-599.

TAHER A, ADERIBIGBE BA, MORGANS GL, MADELEY LG, KHANYE SD, VAN DER WESTHUIZEN L, FERNANDES MA, SMITH VJ, MICHAEL JP, GREEN IR, VAN OTTERLO WAL.A ring-closing metathesis approach to eight-membered benzannelated scaffolds and subsequent internal alkene isomerizations. *Tetrahedron* 2013; 69: 2038-2047.

TIANI GM, AHMED I, KROHN K, GREEN IR, NKENGFACK AE. Kenganthranol F, a new anthranol from *Psorsspermum aurantiacum*. Natural Product Communications 2013; 8(1): 103-104.

VAN ASWEGEN W, HILLER W, HEHN M, PASCH H. Comprehensive triblock copolymer analysis by coupled thermal field-flow fractionation-NMR. *Macromolecular Rapid Communications* 2013; **34** : 1098-1103.

VAN DER MEULEN NP, VAN DER WALT TN, STEYN NP, RAUBENHEIMER HG. The production of ⁸²Sr using larger format RbCl targets. Applied Radiation and Isotopes 2013; **72**: 96-99.

VAN WIJK J, SALARI JWO, ZAQUEN N, MEULDIJK J,

KLUMPERMAN B. Poly(methyl methacrylate)-silica microcapsules by templating Pickering emulsion droplets. *Journal of Materials Chemistry B* 2013; **1**:2394-2406. **WAHL H, HAYNES DA, LE ROEX T**. Hydrate formation in pyridinium pamoate salts. *CrystEngComm* 2013; **15**:2450-2455.

WEBER WG, CHIROWODZA H, PASCH H. 2,2,4,4-Tetrathio substituted I,3-dithietanes. Tetrahedron 2013; 69 : 2017-2021.

WILLEMSE CM, STANDER MA, DE VILLIERS AJ. Hydrophilic interaction chromatographic analysis of anthocyanins. *Journal of Chromatography* A 2013; 1319: 127-140.

ZENGENI E, HARTMANN PC, PASCH H. Crumpled highly filled poly(styrene-co-butyl acrylate)/clay hybrid latexes. *Composites Science and Technology* 2013; **84** : 31-38.

ZENGENI E, HARTMANN PC, PASCH H. Highly filled polystyrene/laponite hybrid nanoparticles prepared using the ad-miniemulsion polymerisation technique. *Macromolecular Chemistry and Physics* 2013; 214 : 62-75.

ZERZUCHA P, KAZURA M, DE BEER D, JOUBERT E, SCHULZE AE, BEELDERS T, DE VILLIERS AJ, WALCZAK B.A new concept for variance analysis of hyphenated chromatographic data avoiding signal warping. *Journal of Chromatography A* 2013; **1291**: 64-72.

ZHENG F, HUTTON AT, VAN SITTERT CGCE, MOSS JR, MAPOLIE SF. Synthesis, structural characterization and *cis-trans* isomerization of novel (salicylaldiminato)platinum(II) complexes. *Dalton Transactions* 2013; 42 : 11163-11179.

ZHOU X, PIZZI A, SAUGET A, NICOLLIN A, LI X, CELZARD A, RODE K, PASCH H. Lightweight tannin foam/composites sandwich panels and the coldset tannin adhesive to assemble them. *Industrial Crops and Products* 2013; **43** : 255-260.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

CHERUTHAZHEKATT S, PIJPERS TFJ, MATHOT VBF, PASCH H.

Preparative TREF – HT–HPLC – HPer DSC: Linking molecular characteristics and thermal properties of an impact poly(propylene) copolymer. *Macromolecular Symposia* 2013; **330** : 22-29.

GIOVANDO S, PIZZI A, PASCH H, PRETORIUS NO. Structure and oligomers distribution of commercial tara (*Caesalpina spinosa*) hydrolysable tannin. *Pro Ligno* 2013; **9**(1):22-31.

HASSAM M, SMITH VJ. 1-tert-Butyl 2-ethyl 5-bromo-3-(thiophen-2-ylcarbonyl)-1H-indole-1,2-dicarboxylate. *Acta Crystallographica* – Section E Structure Reports 2013; **69**: 237.

OBERHOLSTER PJ, BOTHA A-M, CHAMIER J, DE KLERK AR.

Longitudinal trends in water chemistry and phytoplankton assemblage downstream of the Riverview WWTP in the Upper Olifants River. *Ecohydrology & Hydrobiology* 2013; 13:41-51.

SPINA S, ZHOU X, SEGOVIA C, PIZZI A, ROMAGNOLI M,

GIOVANDO S, PASCH H, RODE K, DELMOTTE L. Phenolic resin wood panel adhesives based on chestnut (*Castanea sativa*) hydrolysable tannins. *International Wood Products Journal* 2013; **4** : 95-100.

Verrigtinge internasionaal | Proceedings international

BURGER BV, VIVIERS MZ, LE ROUX NJ, MORRIS J, BEKKER J, LE ROUX M. Neonatal recognition in sheep. Chemical Signals in Vertebrates 12, New York, USA, Springer-Verlag 2013:61-76.

Boeke | Books

PASCH H, TRATHNIGG B. Multidimensional HPLC of polymers. Springer-Verlag, Berlin-Heidelberg-New York, Germany 2013:280 pp.

Doktoraal afgehandel / Doctoral completed

AL.AEEB AZ. Nanocolorants for hot-melt inks. PhD, 2013. 141 pp. Promotor:

Klumperman B. BARBOUR LJ. Mass transfer phenomena in the crystalline solid state. DSc, 2013. 218 pp. Promotor: Esterhuysen C.

BASSON NC. The effect of molecular composition on the properties of polyolefin-wood composites. PhD, 2013. 137 pp. Promotor: van Reenen AJ.

BATISALE. Synthesis and sorption studies of porous metal-organic hosts. PhD, 2013. 135 pp. Promotor: Barbour LJ.

Publikasielys I Publication

list

CHERUTHAZHEKATT S. Novel multidimensional fractionation techniques for the compositional analysis of impact polypropylene copolymers. PhD, 2013. 105 pp. Promotor: Pasch H.

DAVIS JC. Understanding the origin of ^{35/37}Cl and ^{16/18}O isotope effects on ¹⁹⁵Pt and ¹⁰³Rh NMR nuclear shielding in selected Pt(VI) and Rh(III) complexes. A DFT study. PhD, 2013. 228 pp. Promotor: Koch KR, Buhl M.

GESWINDT TE. Chemical speciation of Rh^{III} complexes in acidic, halide-rich media by means of ¹⁰³Rh NMR spectroscopy:The importance of speciation in the selective separation and recovery of rhodium. PhD, 2013. 200 pp. Promotor: Koch KR.

GILDENHUYS J. Interactions of quinoline antimalarial drugs with ferrihaem: Structural and kinetic insights into the inhibition of malaria pigment formation. PhD, 2013. 260 pp. Promotor: de Villiers-Chen KA. Medepromotor: Le Roex T.

GROBLER I. Solid-state dynamics of porous materials. PhD, 2013. 215 pp. Promotor: Barbour LJ. Medepromotor: Esterhuysen C.

HADASHA WAS. Alternating hetero-arm copolymer molecular brushes as scaffolds for inorganic nano-wires. PhD, 2013. 120 pp. Promotor: Klumperman B.

KALILI KM. Comprehensive 2-dimensional liquid chromatographic analysis of phenolics. PhD, 2013. 171 pp. Promotor: De Villiers AJ.

KEULDER L. The preparation of polyolefin nanofibres by solution electrospinning. PhD, 2013. 167 pp. Promotor:Van Reenen AJ.

KOTZE IA. Cation-pi induced association and nano-structured aggregate formation of water-soluble [Pt^{II}(diimine)(Lⁿ-S,O)]⁺ complexes examined with high-resolution ¹H and DOSY NMR. PhD, 2013. 244 pp. Promotor: Koch KR.

LAKAY E. Novel ion-exchange materials derived from poly(styrene-co-maleic anhydride) and a study of the extraction and recovery of gold(III) chloride from aqueous acidic solutions. PhD, 2013. 172 pp. Promotor: Koch KR. Medepromotor: Klumperman B.

PRETORIUS NO. Multidimensional analytical techniques for the characterization of aliphatic polyesters. PhD, 2013. 129 pp. Promotor: Pasch H.

SWART M. The effect of controlled degradation with an organic peroxide on the molecular characteristics and properties of heterophasic propylene-ethylene copolymers (HECO). PhD, 2013. 178 pp. Promotor:Van Reenen AJ.

VAN WYK H. Novel methods of chemical speciation of Pt(IV/II) complexes in acid halide-rich solutions by ion-pair RP-HPLC coupled to ICP-OES/MS in conjunction with ¹⁹⁵Pt NMR. PhD, 2013. 110 pp. Promotor: Koch KR.

FISIKA • PHYSICS

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

AYANGEAKAA AD, GARG U, ANTHONY MD, FRAUENDORF S, ZHANG SQ, ZHAO P-W, QI B, MENG J, JANSSENS RVF, CARPENTER MP, ET AL. Evidence for Multiple Chiral Doublet Bands in ¹³³Ce.

Physical Review Letters 2013; 110 : 172504-1-5. CHEN QB, ZHANG SQ, ZHAO P-W, JOLOS RV, MENG J. Collective Hamiltonian for chiral modes. *Physical Review C* 2013; 87 : 024314-1-7.

EICHBERGER M, ERASMUS N, HAUPT K, KASSIER GH, VON FLOTOW AB, DEMSAR J, SCHWOERER HPH. Femtosecond streaking of electron diffraction patterns to study structural dynamics in crystalline matter. Applied Physics Letters 2013; 102(12): 121106-1-4.

FÚ Y, MEI H, XIANG J, LI ZP, YAO JM, MENG J. Beyond relativistic meanfield studies of low-lying states in neutron-deficient krypton isotopes. *Physical Review C* 2013; 87:054305-1-9.

GU H-Q, LIANG HZ, LONG WH, VAN GIAI N, MENG J. Slater approximation for Coulomb exchange effects in nuclear covariant density functional theory. *Physical Review C* 2013; **87**:041301-1-5.

HANSEN NH, WUNDERLICH C, TOPCZAK AK, ROHWER EJ, SCHWOERER HPH, PFLAUM J. Exciton interaction with a spatially defined charge accumulation layer in the organic semiconductor diindenoperylene. *Physical Review B* 2013; 87 : 241202-1-5.

IBRAHIM AH, ROUX FS, MCLAREN MG, KONRAD T, FORBES A. Orbital-angular-momentum entanglement in turbulence. *Physical Review A* 2013; **88**:012312-1-8.

KOKALOVA TZ, FREER M, BUTHELEZI EZ, CARTER J, FEARICK RW, FÖRTSCH SV, FUJITA H, NEVELING R, PAPKA P, SMIT FD, SWARTZ JA, USMAN I. Precision measurement of the 9.641 MeV, 3^o state in ¹²C. *Physical Review C* 2013; **87**:057307-1-3.

LI J, WEI J, HU JN, RING P, MENG J. Relativistic description of magnetic moments in nuclei with doubly closed shells plus or minus one nucleon. *Physical Review C* 2013; **88** :064307-1-10.

LI ZP, SONG BY, YAO JM, VRETENAR D, MENG J. Simultaneous quadrupole and octupole shape phase transitions in Thorium. *Physics Letters B* 2013; 726 : 866-869.

LIANG HZ, NAKATSUKASA T, NIU Z, MENG J. Feasibility of the finiteamplitude method in covariant density functional theory. *Physical Review C* 2013; 87 : 054310-1-10.

LIANG HZ, SHEN S, ZHAO P-W, MENG J. Pseudospin symmetry in supersymmetric quantum mechanics: Schrodinger equations. *Physical Review C* 2013; 87 : 014334-1-13.

LITVIN IA, BURGER L, FORBES A. Angular self-reconstruction of petal-like beams. Optics Letters 2013; 38(17): 3363-3365.

MAFUSIRE C, FORBES A. Spinning pipe gas lens aberrations along the axis and in the boundary layer. South African Journal of Science 2013; 109(11&12) :Art:#2013-0083. MCLAREN MG, ROMERO J, PADGETT MJ, ROUX FS, FORBES A.

Two-photon optics of Bessel-Gaussian modes. *Physical Review A* 2013; **88**:033818-1-8. **MENG J, CHEN YY, LIANG HZ, NIU YF, NIU ZM, SONG BY, ZHAO P-W, LI Z, SUN B, XU XD, LI ZP, YAO JM, LONG WH, NIKSIC T, VRETENAR D**. Mass and lifetime of unstable nuclei in covariant density functional

theory. Physica Scripta 2013; 2013(T154) : 014010-1-5. MENG J, PENG J, ZHANG SQ, ZHAO P-W. Progress on tilted axis cranking

covariant density functional theory for nuclear magnetic and antimagnetic rotation. Frontiers of Physics 2013; 8:55-79.

NEETHLING PH, ROHWER EG, STAFAST H. Femtosecond laser diagnostics of the built-in electric field across the p⁺-Si/SiO₂ interface and its ultrafast shielding. *Journal of Applied Physics* 2013; **113**(22) : 223704-1-7.

NIU YF, NIU ZM, PAAR N, VRETENAR D, WANG G, BAI JS, MENG J. Pairing transitions in finite-temperature relativistic Hartree-Bogoliubov theory. *Physical Review C* 2013; **88** : 034308-1-8.

NIU ZM, NIU YF, LIANG HZ, LONG WH, NIKSIC T, VRETENAR D, MENG J. B-decay half-lives of neutron-rich nuclei and matter flow in the *r*-process. *Physics Letters B* 2013; **723** : 172-176.

PIETERSE CL. Comments on: "Electrohydrodynamic drop-on-demand patterning in pulsed cone-jet mode at various frequencies" by Joonghyuk Kim, Hyuncheol Oh and Sang Soo Kim. *Journal of Aerosol Science* 2013; **57** : 199-202.

QU XY, CHEN YY, ZHANG SQ, ZHAO P-W, SHIN IJ, LIM Y, KIM Y, MENG J. Extending the nuclear chart by continuum: From oxygen to titanium. Science China-Physics Mechanics & Astronomy 2013; 56(11) : 2031-2036.

REN X-L, GENG LS, CAMALICH JM, MENG J, TOKI H. Quark mass dependence of the ground-state octet baryons in next-to-next-to-next-to-leading order covariant baryon chiral perturbation theory. *Few-Body Systems* 2013; **54** : 1491-1494. **REN X-L, GENG LS, MENG J, TOKI H**. Virtual decuplet effects on octet

baryon masses in covariant baryon chiral perturbation theory. *Physical Review D* 2013; **87**:074001-1-11.

ROHWER EJ, RICHTER C, HEMING N, STRAUCH K, LITWINSKI C, NYOKONG T, SCHLETTWEIN D, SCHWOERER HPH. Ultrafast Photodynamics of the Indoline Dye D149 Adsorbed to Porous ZnO in Dye-Sensitized Solar Cells. *Chemphyschem* 2013; 14(1): 132-139.

SHEN S, LIANG HZ, ZHAO P-W, ZHANG SQ, MENG J. Pseudospin symmetry in supersymmetric quantum mechanics. II. Spin-orbit effects. *Physical Review* C 2013; 88 : 024311-1-5.

SONG BY, LI ZP, YAO JM, MENG J. Energy density functional description of low-lying states in neutron-deficient Sn isotopes. *Physica Scripta* 2013; **2013**(T154) : 014012-1-4.

XIANG J, LI ZP, YAO JM, LONG WH, RING P, MENG J. Effect of pairing correlations on nuclear low-energy structure: BCS and general Bogoliubov transformation. *Physical Review C* 2013; **88**:057301-1-5.

XU C, HUA H, ZHANG SQ, LI XQ, MENG J, LI ZH, LI ZH, CHEN YY, HE C, SUN JJ, SHI Y, LIU HL, ZHU LH, ZHOU S-G, WANG SY, ET AL. Spectroscopy of ¹⁵⁷Yb and structure evolutions in odd-AYb isotopes. *Physical Review C* 2013; **87**:034325-1-11.

XU XD, SUN B, NIU ZM, LI Z, QIAN YZ, MENG J. Reexamining the temperature and neutron density conditions for *r*-process nucleosynthesis with augmented nuclear mass models. *Physical Review C* 2013; **87** :015805-1-10. ZHANG Z-H, MENG J, ZHAO EG, ZHOU S-G. Rotational properties of the superheavy nucleus ²⁵⁶Rf and its neighbouring even-even nuclei in a particle-number-conserving cranked shell model. *Physical Review C* 2013; **87** :054308-1-6. ZHANG Z-H, ZHAO P-W, MENG J, ZENG J-Y, ZHAO EG, ZHOU S-G. Nuclear superfluidity for antimagnetic rotation in ¹⁰⁵Cd and ¹⁰⁶Cd. *Physical Review C* 2013; **87** :054314-1-5.

Verrigtinge internasionaal | Proceedings international

CHEN YY, LI ZP, LIANG HZ, RING P, VAN GIAI N, YAO JM, ZHANG SQ, ZHANG Y, ZHAO P-W, ZHOU S-G, MENG J. Covariant density functional theory for exotic nuclei near the neutron drip-line. Journal of Physics: Conference Series - International Summer School for Advanced Studies 'Dynamics of open nuclear systems' (PREDEAL12), Trei Brazi, Bioterra University, Predeal, Romania, IOP Science 2013:012005-1-10.

COWLEY AA. Alpha-cluster structure in the ground state of ⁴⁰Ca displayed in a (p,pa) knockout reaction. Journal of Physics: Conference Series - 10th International Conference on Clustering Aspects of Nuclear STructure and Dynamics (CLUSTER'12), Debrecen, Hungary, IOP Publishing 2013: 012011-1-3. **KAMANIN DV, PYATKOV YV, ALEXANDROV AA, ALEKSANDROV**

KAMANIN DV, PYATKOV YV, ALEXANDROV AA, ALEKSANDROV VS, JACOBS NM, KAZARINOV N.YU, SHVETSOV VN, KUZNETSOVA EA, RYABOV YV. Proposal on the electrostatic guide based

experimental channel at the IBR-2 reactor. 20th International Seminar on Interaction of Neutrons with Nuclei, Alushta, Alushta, Ukraine, Joint Institute for Nuclear Research 2013: 111-116.

LI J, MENG J, RING P, ZHAO EG, ZHOU SG. Microscopic and self-consistent description for neutron halo in deformed nuclei.AIP Conf. Proc.: XXXV BRAZILIAN WORKSHOP ON NUCLEAR PHYSICS, Sao Paulo, Brazil, 2013: 190-196.

LI J, WEI J, HU JN, MENG J. Magnetic moments for nucleus with double-closed core ± one nucleon.AIP Conf. Proc.: 8TH CHINA-JAPAN JOINT NUCLEAR PHYSICS SYMPOSIUM: (CJJNPS2012), Beijing, China, 2013: 140-147.

MENG J, CHEN YY, NIU Z, SUN B, ZHAO P-W. Impact on the r-process from the nuclear mass and lifetime in covariant density functional theory. Journal of Physics: Conference Series – International Symposium on Exotic Nuclear Structure from

Publikasielys | Publication

list

Nucleons (ENSFN 2012), University of Tokyo, , China, IOP Science 2013: 12016. **NEETHLING PH, ROHWER EG, STAFAST H**. Non-quadratic intensity dependence of the second harmonic signal from the p+-Si/SiO₂ interface due to ultrafast photoinduced charge carrier screening. 2013 Conference on Lasers and Electro-Optics Europe

Induced charge carrier screening, 2013 Conference on Lasers and Electro-Optics Europe and International Quantum Electronics Conference (CLEO®/Europe-IQEC), International Congress Centre, Munich, Germany, Messe Munchen International 2013: 118.
PAPKA P, KHALEEL EMA, VYMERS P, DINOKO TS, RICHTER WA,

SHARPEY-SCHAFER JF, JONES P, LAWRIE EA, LAWRIE JJ, MAJOLA SNT, SHIRINDA O, WIEDEKING M, STANKIEWICZ MA, BROWN

BA. High Resolution (3 He, n) Two Proton Stripping Reaction to 0⁺ States Populated in 2B Decay. 51st International Winter Meeting on Nuclear Physics(PoS), Bornio, Italy, Proceedings of Science 2013: 1-6.

PIETERSE CL. Electrohydrodynamic Atomization Limitations at Atmospheric Conditions Due to Corona Discharge. EuroCon 2013, University of Zagreb, Zagreb, Croatia (local name: Hrvatska), IEEE Xplore 2013: 1897-1903.

SPANGENBERG D, DUDLEY A, NEETHLING PH, FORBES A,

ROHWER EG. The effect of spatial light modulator (SLM) dependent dispersion on spatial beam shaping. Laser Beam Shaping XIV, Proceedings of SPIE Vol.8843, San Diego, Convention Center, San Diego, California, USA, Proceedings of SPIE 2013:Art. CID #884308 8.

VAN ZYL JJ, COWLEY AA, NEVELING R, BUTHELEZI EZ, FÖRTSCH SV, MIRA J, SMIT FD, STEYN GF, SWARTZ JA, USMAN I. Angular

Distributions of the Analyzing Power in the Excitation of Low Lying States of ⁵⁶Co. Proceedings of the 13th International Conference on Nuclear Reaction Mechanisms (CERN-Proceedings 2012),Villa Monastero,Varenna, Italy, CERN-Proceedings 2013: 181-185.

Verrigtinge nasionaal | Proceedings national

VAWDA Z, PITCHER R, GROENEWALD WA, DU PLESSIS AM.A

comparison of the radiatin dose for paediatric CT head scans from two multiple-detector-CT (MDCT) scanners at Tygerberg Hospital (TBH).Abstract 176.57th Annual Academic Day, Faculty of Medicine and Health Sciences, Tygerberg, South Africa, 2013: 188.

Doktoraal afgehandel | Doctoral completed

ERASMUS N. Ultrafast Structural Dynamics in 4Hb-TaSe2 observed by Femtosecond Electron Diffraction. PhD, 2013. 90 pp. Promotor: Schwoerer HPH. Medepromotor: Rohwer EG.

HAUPT K. Phase Transitions in Transition Metal Dichalcogenides studied by Femtosecond Electron Diffraction. PhD, 2013. 70 pp. Promotor: Schwoerer HPH. Medepromotor: Rohwer EG.

MIRA J. The role played by quasi-elastic and inelastic break-up of the 12C and 160 projectiles in the production of Intermediate Mass Fragments at 14-35 MeV/u. PhD, 2013. 177 pp. Promotor: Papka P. Medepromotor: Förtsch SV.

FISIOLOGIESE WETENSKAPPE • PHYSIOLOGICAL SCIENCE

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

CAPRANICA L, PIACENTINI MF, HALSON S, MYBURGH KH, OGASAWARA E, MILLARD-STAFFORD M. The Gender Gap in Sport Performance: Equity Influences Equality. International Journal of Sports Physiology and Performance 2013: 8 : 99-103.

FLEPISI TB, LOCHNER A, HUISAMEN B. The consequences of long-term glycogen synthase kinase-3 inhibition on normal and insulin resistant rat hearts. *Cardiovascular Drugs and Therapy* 2013; **27** : 381-392.

GOETSCH KP, MYBURGH KH, NIESLER CU. In Vitro myoblast motility models: investigating migration dynamics for the study of skeletal muscle repair. *Journal* of Muscle Research and Cell Motility 2013; **34**: 333-347.

HEUNIS TDJ, SMITH C, DICKS LMT. Evaluation of a nisin-eluting nanofiber scaffold to treat Staphylococcus aureus-induced skin infections in mice. *Antimicrobial Agents and Chemotherapy* 2013; **57**(8) : 3928-3935.

LOOS B, ENGELBRECHT A-M, LOCKSHIN RA, KLIONSKY DJ, ZAKERI Z. The variability of autophagy and cell death susceptibility. Unanswered questions. *Autophagy* 2013; 9(9) : 1-16.

MACALUSO F, BROOKS N, NIESLER CU, MYBURGH KH. Satellite cell pool expansion is affected by skeletal muscle characteristics. *Muscle & Nerve* 2013; 48 : 109-116.

REYSKENS KMSE, ESSOP MF. The Maladaptive Effects of HIV Protease Inhibitors (Lopinavir/Ritonavir) on the Rat Heart. *International Journal of Cardiology* 2013; **168**(3): 3047-3049.

REYSKENS KMSE, FISHER T-L, SCHISLER JC, O'CONNOR WG, ROGERS AB, WILLIS MS, PLANESSE C, BOYER F, RONDEAU P, BOURDON E, ESSOP MF. Cardio-Metabolic Effects of HIV Protease Inhibitors (Lopinavir/Ritonavir). PLoS ONE 2013; 8(9) :e73347.

SISHI BJN, LOOS B, VAN ROOYEN J, ENGELBRECHT A-M. Autophagy upregulation promotes survival and attenuates doxorubicin-induced cardiotoxicity. Biochemical Pharmacology 2013; 85 : 124-134.

SISHI BJN, LOOS B, VAN ROOYEN J, ENGELBRECHT A-M.

Doxorubicin induces protein ubiquitination and inhibits proteasome activity during cardiotoxicity. *Toxicology* 2013; **309** : 23-29.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

BRAND A, SMITH C, DICKS LMT. The effects of continuous in vivo administration of nisin on Staphylococcus aureus infection and immune response in mice. Probiotics and Antimicrobial Proteins. *Probiotics and Antimicrobial Proteins* 2013; 5 : 279-286.

BRAND AM, SMITH C, DICKS LMT. The Effects of Continuous In Vivo Administration of Nisin on *Staphylococcus aureus* Infection and Immune Response in Mice. *Probiotics and Antimicrobial Proteins* 2013; **5** : 279-286.

DURCAN P , AL-SHANTI N, STEWART CE. Identification and characterization of novel Kirrel isoform during myogenesis. *Physiological Reports* 2013; I:I-13.

SNYMAN C, GOETSCH KP, MYBURGH KH. Simple silicone chamber system for in vitro three-dimensonal skeletal muscle tissue formation. *Frontiers in Physiology* 2013; **4**:1-6.

Doktoraal afgehandel | Doctoral completed

IMBRIOLO J. The hexosamine biosynthetic pathway induces gene promoter activity of the cardiac-enriched isoform of acetyl-CoA carboxylase. PhD(Fisiol), 2013. 135 pp. Promotor: Essop MF.

LEISCHING G. The manipulation of the autophagic pathway sensitises cervical cancer cells to cisplatin treatment. PhD(Fisiol), 2013. 229 pp. Promotor: Engelbrecht A-M. MAPANGA RF. Novel agents to blunt hyperglycemia-induced cardiac dysfunction with ischemia and reperfusion. PhD(Fisiol), 2013. 336 pp. Promotor: Essop MF. REYSKENS KMSE. The Maladaptive Effects of HIV Protease Inhibitors on the Rat

Heart. PhD(Fisiol), 2013. 300 pp. Promotor: Essop MF. VAN DE VYVER M. The contribution of inflammatory mediators to delayed secondary muscle damage. PhD(Fisiol), 2013. 228 pp. Promotor: Myburgh KH.

INSTITUUT VIR TEORETIESE FISIKA • INSTITUTE OF THEORETICAL PHYSICS

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

ANGELETTI F, BERTIN E, ABRY P. Statistics of sums of correlated variables described by a matrix product ansatz. EPL 2013; 104(5) : 50009-1-6.

BACHELARD R, KASTNER M. Universal threshold for the dynamical behavior of lattice systems with long-range interactions. *Physical Review Letters* 2013; **110**(17): 170603-1-5.

BRINK J, ZIMMERMAN A, HINDERER T. Avenues for analytic exploration in axisymmetric spacetimes: Foundations and the triad formalism. *Physical Review D* 2013; **88** : 044039-1-40.

CHAKRABORTY B, SCHOLTZ FG. Spectral triplets, statistical mechanics and emergent geometry in non-commutative quantum mechanics. *Journal of Physics A* – *Mathematical and Theoretical* 2013; **46**(8): 085204-1-16.

CHEN Y, BAULE A, TOUCHETTE H, JUST W. Weak-noise limit of a piecewise-smooth stochastic differential equation. *Physical Review E* 2013; 88:052103-1-15. CHETRITE R, TOUCHETTE H. Nonequilibrium Microcanonical and Canonical Ensembles and Their Equivalence. *Physical Review Letters* 2013; 111:120601-1-5. DIENER JPW, SCHOLTZ FG. Saturated symmetric nuclear matter in strong magnetic fields. *Physical Review C* 2013; 87:065805-1-10.

EGGERS HC, BUSCHBECK B. Internal cumulants for femtoscopy with fixed charged multiplicity. Advances in High Energy Physics 2013; 2013 : Art. ID 230515. EISERT J, VAN DEN WORM M, MANMANA SR, KASTNER M. Breakdown of Quasilocality in Long-Range Quantum Lattice Models. Physical Review Letters 2013; 111 : 160401-1-5.

FANTONI R. Hellmann and Feynman theorem versus diffusion Monte Carlo experiment. Solid State Communications 2013; **159** : 106-109.

GRADENIGO G, SARRACINO A, PUGLISI A, TOUCHETTE H. Fluctuation relations without uniform large deviations. *Journal of Physics A – Mathematical and Theoretical* 2013: **46**(33): 335002-1-12.

GRAHAM N, QUANDT M, WEIGEL H.Attractive electromagnetic Casimir stress on a spherical dielectric shell. *Physics Letters B* 2013; **726** : 846-849. HEISS WD, CARTARIUS H, WUNNER G, MAIN J. Spectral singularities in PT-symmetric Bose-Einstein condensates. *Journal of Physics A – Mathematical and*

Theoretical 2013; **46**(27) : 275307-1-16. **MEHTA D, STARIOLO DA, KASTNER M**. Energy landscape of the finite-size

spherical three-spin glass model. *Physical Review E* 2013; **87** : 052143-1-9. **NERATTINI R, KASTNER M, MEHTA D, CASETTI L**. Exploring the energy landscape of XY models. *Physical Review E* 2013; **87** : 032140-1-12. **QUANDT M, GRAHAM N, WEIGEL H**. Quantum stabilization of a closed Nielsen-Olesen string. *Physical Review D* 2013; **87** : 085013-1-16.

VAN DEN WORM M, SAWYER BC, BOLLINGER JJ, KASTNER M. Relaxation timescales and decay of correlations in a long-range interacting quantum simulator. New Journal of Physics 2013; 15(8):083007-1-19.

MIKROBIOLOGIE • MICROBIOLOGY

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

ACUNA LG, CARDENAS JP, COVARRUBIAS PC, HARISTOY JJ, FLORES R, NUNEZ H, RIADI G, SHMARYAHU A, VALDES J, DOPSON M, RAWLINGS DE, BANFIELD JF, HOLMES DS, QUATRINI RA. Architecture and Gene Repertoire of the Flexible Genome of the Extreme Acidophile Acidithiobacillus caldus. PLoS ONE 2013; 8(11) : e78237.

Externe Actophile Actinitionacting Calcus, FLOS ONE 2013; 6(11): 676257.
CHEN XZ, ZHOU L, TIAN KM, KUMAR A, SINGH S, PRIOR BA,
WANG Z-X. Metabolic engineering of Escherichia coli:A sustainable industrial platform for bio-based chemical production. *Biotechnology Advances* 2013; 31: 1200-1223.
DE KWAADSTENIET M, DOBROWSKY P, VAN DEVENTER A,
KHAN W, CLOETE TE. Domestic Rainwater Harvesting: Microbial and Chemical Water Quality and Point-of-Use Treatment Systems. *Water Air and Soil Pollution* 2013; 224: Art. 1629.

DEN HAAN R, KROUKAMP H, MERT M, BLOOM M, GÖRGENS JF, VAN ZYL WH. Engineering Saccharomyces cerevisiae for next generation ethanol production. Journal of Chemical Technology and Biotechnology 2013; 88 : 983-991. DEN HAAN R, KROUKAMP H, VAN ZYL JHDV, VAN ZYL WH. Cellobiohydrolase secretion by yeast: current state and prospects for improvement.

Process Biochemistry 2013; **48**: 1-12. **DEN HAAN R, VAN ZYL JM, HARMS TM, VAN ZYL WH**. Modelling the minimum enzymatic requirements for optimal cellulose conversion. *Environmental*

Research Letters 2013; 8 :Art. 025013. DICKS LMT, PETROV K. Fusobacterium necrophorum, and not Dichelobacter nodosus, is highly associated with equine hoof thrush. Veterinary Microbiology 2013; 161 : 350-352. DU PLESSIS DM, BOTES M, DICKS LMT, CLOETE TE. Immobilization of commercial hydrolytic enzymes on poly(acrylonitrile) nanofibers for anti-biofilm activity. Journal of Chemical Technology and Biotechnology 2013; 88(4) : 585-593.

ENDO A, IRISAWA T, ENDO Y, SALMINEN S, OHKUMA M, DICKS LMT. Lactobacillus faccis sp. nov., isolated from animal facces. International Journal of Systematic and Evolutionary Microbiology 2013; 63 : 4502-4507.

FAVARO L, BASAGLIA M, TRENTO A, VAN RENSBURG E, GARCIA-APARICIO M, VAN ZYL WH, CASELLA S. Exploring grape marc as trove for new thermotolerant and inhibitor-tolerant Saccharomyces cerevisiae strains for secondgeneration bioethanol production. Biotechnology for Biofuels 2013; 6 :Art. 168.

FAVARO L, BASAGLIA M, VAN ZYL WH, CASELLA S. Using an efficient fermenting yeast enhances ethanol production from unfiltered wheat bran hydrolysates. *Applied Energy* 2013; **102** : 170-178.

FERREIRA T, VAN REENEN C, ENDO A, SPRÖER C, MALAN AP, DICKS LMT. Description of Xenorhabdus khoisanae sp. nov., the symbiont of the entomopathogenic nematode Steinernema khoisanae. International Journal of Systematic and Evolutionary Microbiology 2013; 63: 3220-3224.

FERREIRA T, VAN REENEN C, PAGÈS S, TAILLIEZ P, MALAN AP, DICKS LTM. Photorhabdus luminescens subsp. noenieputensis subsp. nov., a symbiotic bacterium associated with a novel Heterorhabditis species related to Heterorhabditis indica. International Journal of Systematic and Evolutionary Microbiology 2013; 63 : 1853-1858.

GULE NP, DE KWAADSTENIET M, CLOETE TE, KLUMPERMAN B. Furanone-containing poly(vinyl alcohol) nanofibers for cell-adhesion inhibition. *Water Research* 2013; **47** : 1049-1059.

HEUNIS TDJ, SMITH C, DICKS LMT. Evaluation of a nisin-eluting nanofiber scaffold to treat Staphylococcus aureus-induced skin infections in mice. *Antimicrobial Agents and Chemotherapy* 2013; **57**(8) : 3928-3935.

JACHLEWSKI S, BOTES M, CLOETE TE. The effect of ultrasound at 256 KHz on *Microcystis aeruginosa*, with and without gas vacuoles. *Water* SA 2013; **39**(1): 171-174. JACKSON VA, PAULSE AN, ODENDAAL JP, KHAN W. Identification of Point Sources of Metal Pollution in the Berg River, Western Cape, South Africa. *Water* Air and Soil Pollution 2013; **224**: Art. 1477.

JOOSTE T, GARCIA-APARICIO M, BRIENZO M, VAN ZYL WH, GÖRGENS JF. Enzymatic Hydrolysis of Spent Coffee Ground. Applied Biochemistry and Biotechnology 2013; 169(8) : 2248-2262.

KROUKAMP H, DEN HAAN R, VAN WYK N, VAN ZYL WH. Overexpression of native *PSE1* and *SOD1* in Saccharomyces cerevisiae improved heterologous cellulase production. *Applied Energy* 2013; **102** : 150-156.

MAKHLOUFI, KM, CARRÉ-MLOUKA A, PEDUZZI J, LOMBARD C, VAN REENEN C, DICKS LMT, REBUFFAT S. Characterization of Leucocin B-KM432Bz from Leuconostoc pseudomesenteroides Isolated from Boza, and Comparison of its Efficiency to Pediocin PA-1. *PLoS ONE* 2013; **8**(8) : e70484.

MARX IJ, VAN WYK N, SMIT S, JACOBSON D, VILJOEN-BLOOM M, VOLSCHENK H. Comparative secretome analysis of *Trichoderma asperrellum* S4F8 and *Trichoderma reesei* Rut C30 during solid-state fermentation on sugarcane bagasse. *Biotechnology for Biofuels* 2013; **6** :Art 172.

NGUEMA-ONA EE, MOORE JP, FAGERSTROM A, FANGEL JU, WILLATS WGT, HUGO A, VIVIER MA. Overexpression of the grapevine PGIPI in tobacco results in compositional changes in the leaf arabinoxyloglucan network in the absence of fungal infection. *BMC Plant Biology* 2013; **13** : 46.

PETROV K, DICKS LMT. Footrot in clawed and hoofed animals: Symptoms, causes and treatments. Biotechnology & Biotechnological Equipment 2013; 27 : 3470-3477.

VAN WYK N, TROLLIP K, STEENKAMP ET, WINGFIELD BD,

VOLSCHENK H. Identification of the gene for â-fructofuranosidase from *Ceratocystis moniliformis* CMW 10134 and characterization of the enzyme expressed in *Saccharomyces cerevisiae. BMC Biotechnology* 2013; **13** :Art. 100.

VAN ZYL WH. Special issue from the 20th International Symposium on Alcohol Fuels (ISAF 2013): alcohol fuels enabling sustainable future development. *Biotechnology* for Biofuels 2013; **6** :Art 176.

VIKTOR M, ROSE SH, VAN ZYL WH, VILJOEN-BLOOM M. Raw starch conversion by Saccharomyces cerevisiae expressing Aspergillus tubingensis amylases. Biotechnology for Biofuels 2013; 6 : Art. 167.

VISAGIE CM, HOUBRAKEN J, RODRIQUES C, SILVA PEREIRA C, DIJKSTERHUIS J, SEIFERT KA, JACOBS K, SAMSON RA. Five new Penicillium species in section *Sclerotiora*: a tribute to the Dutch Royal family. *Persoonia* 2013; **31** : 42-62.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

BRAND AM, SMITH C, DICKS LMT. The Effects of Continuous In Vivo Administration of Nisin on Staphylococcus aureus Infection and Immune Response in Mice. Probiotics and Antimicrobial Proteins 2013; 5 : 279-286. FAVARO L, GÖRGENS JF, JOOSTE T, BASAGLIA M, ROSE SH,

SAAYMAN M, CASELLA S, VAN ZYL WH. Designing industrial yeasts for the consolidated bioprocessing of starchy biomass to ethanol. *Bioengineered* 2013; **4**(2) : 1-6.

Hoofstukke in boeke | Chapters in books

VAN ZYL WH, DEN HAAN R, LA GRANGE DC. Developing Cellulolytic Organisms for Consolidated Bioprocessing of Lignocellulosics. In *Biofuel Technologies: Recent Developments*, Springer Verlag, Berlin Heidelberg, Germany, 2013: 189-220.

PLANT- EN DIERKUNDE • BOTANY AND ZOOLOGY

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

ALEXANDER ME, DICK JT, O'CONNOR NE. Trait-mediated indirect interactions in a marine intertidal system as quantified by functional responses. *Oikos* 2013; 122 : 1521–1531.

ALEXANDER ME, DICK JTA, O'CONNOR NE. Born to kill: Predatory functional responses of the littoral amphipod *Echinogammarus marinus* leach throughout its life history. *Journal of Experimental Marine Biology and Ecology* 2013; **439** : 92–99. AUGUSTYN WJ, ANDERSON BC, STILLER M, ELLIS AG. Specialised

host-use and phenophase tracking in restio leafhoppers (Cicadellidae: Cephalelini) in the Cape Floristic Region. *Journal of Insect Conservation* 2013; **17** : 1267–1274. **BARLOW A, BAKER K, HENDRY CR, PEPPIN L, PHELPS T, TOLLEY**

KA, WÜSTER CE, WÜSTER W. Phylogeography of the widespread African puff adder (*Bitis arietans*) reveals multiple Pleistocene refugia in southern Africa. *Molecular Ecology* 2013; **22** : 1134–1157.

BARNAUD A, KALWIJ JM, BERTHOULY-SALAZAR C, MCGEOCH MA, JANSEN VAN VUUREN B. Are road verges corridors for weed invasion? Insights from the fine-scale spatial genetic structure of *Raphanus raphanistrum*. Weed Research 2013; **53** : 362–369.

BARNAUD A, KALWIJ JM, MCGEOCH MA, JANSEN VAN VUUREN B. Patterns of weed invasion: evidence from the spatial genetic structure of *Raphanus raphanistrum*. *Biological Invasions* 2013; **15** : 2455-2465.

BATES MF, TOLLEY KA, EDWARDS S, DAVIDS Z, DA SILVA JM, BRANCH WR. A molecular phylogeny of the African plated lizards, genus gerrhosaurus wiegmann, 1828 (squamata: *Gerrhosauridae*), with the description of two new genera. *Zootaxa* 2013; **3750**(5): 465-493.

BERTHOULY-SALAZAR C, HUI C, BLACKBURN TM, GABORIAUD C, VAN RENSBURG BJ, JANSEN VAN VUUREN B, LE ROUX JJ. Longdistance dispersal maximizes evolutionary potential during rapid geographic range expansion. *Molecular Ecology* 2013; 22 : 5793–5804.

BLIGNAUT M, ELLIS AG, LE ROUX JJ. Towards a Transferable and Cost-Effective Plant AFLP Protocol. *PLoS ONE* 2013; 8 : e61704.

BONATO M, EVANS MR, HASSELQUIST D, SHERLEY RB, CLOETE SWP, CHERRY MI. Ostrich chick humoral immune responses and growth rate is predicted by parental immune responses and paternal colouration. *Behavioral Ecology* and Sociobiology 2013; 67(2): 1891-1901.

BRANCH GM, BUSTAMANTE RH, ROBINSON TB. Impacts of a 'black tide' harmful algal bloom on rocky-shore intertidal communities on the West Coast of South Africa. *Harmful Algae* 2013; **24** : 54–64.

BROECKHOVEN C, MOUTON PLN. Influence of diet on prehension mode in cordylid lizards: a morphological and kinematic analysis. *Journal of Zoology* 2013; 291 : 286–295.

CAMPANA MG, ROBINSON TJ, CAMPOS PF, TUROSS N. Independent confirmation of a diagnostic sheep/goat peptide sequence through DNA analysis and further exploration of its taxonomic utility within the Bovidae. *Journal of Archaeological Science* 2013; **40** : 1421-1424.

CANGI NMM, HORAK IG, APANASKEVICH DA, MATTHEE S, DAS NEVES LCBG, ESTRADA-PEÑA A, MATTHEE CA. The Influence of Interspecific Competition and Host Preference on the Phylogeography of Two African Ixodid Tick Species. *PLoS ONE* 2013; **8** :e76930.

CAPLAT P, CHEPTOU P-O, DIEZ J, GUISAN A, LARSON BMH, MACDOUGALL AS, PELTZER DA, RICHARDSON DM, SHEA K, VAN KLEUNEN M, ZHANG R, BUCKLEY YM. Movement, impacts and management of plant distributions in response to climate change: insights from invasions. *Oikos* 2013; **122**: 1265-1274.

CERNOHORSKA H, KUBICKOVA S, KOPECNA O, KULEMZINA AI, PERELMAN PL, ELDER FFB, ROBINSON TJ, GRAPHODATSKY AS, RUBES J. Molecular cytogenetic insights to the phylogenetic affinities of the giraffe (Giraffa camelopardalis) and pronghorn (Antilocapra americana). Chromosome Research 2013; 21 : 447–460.

COETZEE BWT, LE ROUX PC, CHOWN SL. Scale effects on the body size

frequency distributions of African birds: patterns and potential mechanisms. *Global Ecology and Biogeography* 2013; **22** : 380–390.

CONRADIE B, TREURNICHT M, ESLER KJ, GAERTNER M.

Conservation begins after breakfast: The relative importance of opportunity cost and identity in shaping private landholder participation in conservation. *Biological Conservation* 2013; **158**: 334-341.

CONRADIE W, BRANCH WR, TOLLEY KA. Fifty Shades of Grey: giving colour to the poorly known Angolan Ashy reed frog (Hyperoliidae: Hyperolius cinereus), with the description of a new species. *Zootaxa* 2013; **3635** : 201–223.

DA SILVA JM, TOLLEY KA. Ecomorphological variation and sexual dimorphism in a recent radiation of dwarf chameleons (*Bradypodion*). *Biological Journal of the Linnean Society* 2013; **109** : 113-130.

DANIELS CW, MABUSELA WT, MARNEWICK JL, VALENTINE AJ. Photosynthetic adaptation of two semi-arid species of *Gethyllis* (Kukumakranka) to drought-and-shade stress. *South African Journal of Botany* 2013; **88**: 36–41.

DANIELS SR, MCDONALD DE, PICKER MD. Evolutionary insight into the Peripatopsis balfouri sensu lato species complex (Onychophora: Peripatopsidae) reveals novel lineages and zoogeographic patterning. Zoologica Scripta 2013; 42 : 656–674. DAVIES SJ, CLUSELLA-TRULLAS S, HUI C, MCGEOCH MA. Farm

dams facilitate amphibian invasion: Extra-limital range expansion of the painted reed frog in South Africa. Austral Ecology 2013; **38**:851–863.

DE JAGER ML, ELLIS AG. The influence of pollinator phylogeography and mate preference of floral divergence in a sexually deceptive daisy. *Evolution* 2013; **67** : 1706–1714.

DILLEY BJ, DAVIES D, CONNAN M, COOPER J, DE VILLIERS M, SWART L, VANDENABEELE S, ROPERT-COUDERT Y, RYAN PG. Giant petrels as predators of albatross chicks. *Polar Biology* 2013; **36** : 761–766. DREXLER JF, CORMAN VM, MULLER MA, LUKASHEV AN, GMYL A, COUTARD B, ADAMS A, RITZ D, RITZ D, LEIJTEN LM, MATTHEE S, ET AL . Evidence for Novel Hepaciviruses in Rodents. *PloS Pathogens* 2013; **9**(6) : e1003438.

DREYER LL, ROETS F, OBERLANDER KC. Two new Oxalis (Oxalidaceae) species from the Richtersveld National Park, South Africa. *Phytotaxa* 2013; **89**(2):53-63. DU TOIT N, JANSEN VAN VUUREN B, MATTHEE S, MATTHEE CA. Biogeography and host-related factors trump parasite life history: limited congruence among the genetic structures of specific ectoparasitic lice and their rodent hosts. *Molecular Ecology* 2013; **22**: 5185–5204.

DU TOIT N, MATTHEE S, MATTHEE CA. The sympatric occurrence of two genetically divergent lineages of sucking louse, *Polyplax arvicanthis* (phthiraptera: Anoplura), on the four-striped mouse genus, *Rhabdomys* (Rodentia: Muridae). *Parasitology* 2013; **140** : 604-616.

EDWARDS S, BRANCH WR, VANHOOYDONCK B, HERREL A, MEASEY GJ, TOLLEY KA. Taxonomic adjustments in the systematics of the southern African lacertid lizards (Sauria: Lacertidae). Zootaxa 2013; 3669 : 101–114. EDWARDS S, TOLLEY KA, VANHOOYDONCK B, MEASEY GJ, HERREL A. Is dietary niche breadth linked to morphology and performance in Sandveld lizards Nucras (Sauria: Lacertidae)? Biological Journal of the Linnean Society 2013; 110 : 674–688.

ENGELBRECHT HM, VAN NIEKERK A, HEIDEMAN NJL, DANIELS SR.Tracking the impact of Pliocene/ Pleistocene sea level and climatic oscillations on the cladogenesis of the Cape legless skink, *Acontias meleagris* species complex, in South Africa. *Journal of Biogeography* 2013; **40** : 492–506.

FATH BD, SCHARLER UM, BAIRD D. Dependence of network metrics on model aggregation and throughflow calculations: Demonstration using the Sylt–Rømø Bight Ecosystem. *Ecological Modelling* 2013; **252** :214–219.

FAWOLE OA, MAKUNGA NP, OPARA UL. Antibacterial, antioxidant and tyrosinase-inhibition activities of pomegranate fruit peel methanolic extract. BMC *Complementary and Alternative Medicine* 2012; **12** :Art. 200.

GEERTS S, BOTHA PW, VISSER V, RICHARDSON DM, WILSON JRU. Montpellier broom (*Genista monspessulana*) and Spanish broom (*Spartium junceum*) in South Africa: An assessment of invasiveness and options for management. *South African Journal of Botany* 2013; 87 : 134–145.

GEERTS S, MOODLEY D, GAERTNER M, LE ROUX JJ, MCGEOCH MA, MUOFHE C, RICHARDSON DM, WILSON JRU. The absence of fire can cause a lag phase: The invasion dynamics of *Banksia ericifolia* (Proteaceae). *Austral Ecology* 2013; **38**:931-941.

GIBSON MR, PAUW A, RICHARDSON DM. Decreased insect visitation to a native species caused by an invasive tree in the Cape Floristic Region. *Biological Conservation* 2013; **157** : 196–203.

GILIOMEE JH. Entomology in South Africa: Where do we come from, where are we now and where are we going? *South African Journal of Science* 2013; **109**(1/2) : Art. #a004. **GIPPOLITI S, COTTERILL FPD, GROVES CP**. Mammal taxonomy without taxonomists: a reply to Zachos and Lovari. HYSTRIX-Italian Journal of Mammalogy 2013; **24** : 145-147.

HAUKKA AK, DREYER LL, ESLER KJ. Effect of soil type and climatic conditions on the growth and flowering phenology of three Oxalis species in the Western Cape, South Africa. South African Journal of Botany 2013; 88 : 152-163. HERREL A, TOLLEY KA, MEASEY GJ, DA SILVA JM, POTGIETER DF, BOLLER E, BOISTEL R, VANHOOYDONCK B. Slow but tenacious: an analysis of running and gripping performance in chameleons. Journal of Experimental Biology 2013; 216 : 1025-1030.

HILL MP, CHOWN SL, HOFFMANN AA. A predicted niche shift corresponds with increased thermal resistance in an invasive mite, *Halotydeus*

destructor. Global Ecology and Biogeography 2013; 22: 942–951.

HITCHCOCK AN, OLIVER EGH, THOMAS V. Erica verticillata Ericaceae. Flowering Plants of Africa (The Flowering Plants of South Africa) 2013; 63: 104–119. HOFFMANN AA, CHOWN SL, CLUSELLA-TRULLAS S. Upper thermal limits in terrestrial ectotherms: how constrained are they? Functional Ecology 2013; 27: 934–949.

HORAK J, HUI C, ROURA-PASCUAL N, ROMPORTL D. Changing roles of propagule, climate, and land use during extralimital colonization of a rose chafer beetle. *Naturwissenschaften* 2013; **100** : 327–336.

HUI C, RICHARDSON DM, PYŠEK P, LE ROUX JJ, KUCERA T,

JAROŠÍK V. Increasing functional modularity with residence time in the co-distribution of native and introduced vascular plants. *Nature Communications* 2013; **4** : 3454. IMPSON ND, VAN WILGEN BW, WEYL OLF. Coordinated approaches to

rehabilitating a river ecosystem invaded by alien plants and fish. South African Journal of Science 2013; **109**(11/12) :Art.#a0041.

ITHETE NL, STOFFBERG S, CORMAN VM, COTTONTAIL VM, RICHARDS LR, SCHOEMAN MC, DROSTEN C, DREXLER JF, PREISER W. Close relative of Human Middle East respiratory syndrome

Coronavirus in Bat, South Africa. Emerging Infectious Diseases 2013; 19(10): 1697-1699. KARSTEN M, JANSEN VAN VUUREN B, BARNAUD A,

TERBLANCHE JS. Population Genetics of *Ceratitis capitata* in South Africa: Implications for Dispersal and Pest Management. *PLoS ONE* 2013; **8**(1): e54281. **KATZ EM, TOLLEY KA, ALTWEGG R**. Survival and abundance of Cape dwarf chameleons, *Bradypodion pumilum*, inhabiting a transformed, semi-urban wetland. *Herpetological Journal* 2013; **23**: 179–186.

KAYAALP P, SCHWARZ MP, STEVENS MI. Rapid diversification in Australia and two dispersals out of Australia in the globally distributed bee genus, *Hylaeus* (Colletidae: Hylaeinae). *Molecular Phylogenetics and Evolution* 2013; **66** : 668–678.

KNIGHT LI, NG BL, CHENG W, FU B, YANG F, RAMBAU RV. Tracking Chromosome Evolution in Southern African Gerbils Using Flow-Sorted Chromosome Paints. *Cytogenetic and Genome Research* 2013; **139** : 267–275.

KRAAIJ T, COWLING RM, VAN WILGEN BW. Fire regimes in eastern coastal fynbos: Imperatives and thresholds in managing for diversity. *Koedoe* 2013; **55**(1): Art:#1104.

KREJCIKOVA J, SUDOVÁ R, LUCANOVÁ M, TRÁVNÍCEK P, URFUS T, VÍT P, WEISS-SCHNEEWEISS H, KOLANO B, OBERLANDER KC, DREYER LL, SUDA J. High ploidy diversity and distinct patterns of cytotype distribution in a widespread species of *Oxalis* in the Greater Cape Floristic Region. *Annals of Botany* 2013; 111(4): 641–649.

KREJCIKOVA J, SUDOVÁ R, OBERLANDER KC, DREYER LL, SUDA J. Cytogeography of Oxalis pes-caprae in its native range: where are the pentaploids? Biological Invasions 2013; 15(6) : 1189–1194.

KRĚJCIKOVA J, SUDOVÁ R, OBERLANDER KC, DREYER LL, SUDA J. The spatio-ecological segregation of different cytotypes of Oxalis obtusa (Oxalidaceae) in contact zones. South African Journal of Botany 2013; 88: 62–68. KUEFFER C, PYŠEK P, RICHARDSON DM. Integrative invasion science: model systems multi-site studies focused meta-analysis and invasion syndromes. Neu

model systems, multi-site studies, focused meta-analysis and invasion syndromes. New Phytologist 2013; 200 :615-633. KUMSCHICK S, BACHER S, BLACKBURN TM.What determines the

impact of alien birds and mammals in Europe? *Biological Invasions* 2013; **15**:785–797. **KUMSCHICK S, HUFBAUER RA, ALBA C, BLUMENTHAL DM**. Evolution of fast-growing and more resistant phenotypes in introduced common mullein (*Verbascum thapsus*). *Journal of Ecology* 2013; **101**: 378–387. **KUMSCHICK S, RICHARDSON DM**. Species-based risk assessments for

biological invasions: advances and challenges. Diversity and Distributions 2013; 19 : 1095-1105.

LE ROUX JJ, RICHARDSON DM, WILSON JRU, NDLOVU J. Human usage in the native range may determine future genetic structure of an invasion: insights from *Acacia pycnantha*. *BMC Ecology* 2013; **13** :Art. 37.

LE ROUX PC, RAMASWIELA T, KALWIJ JM, SHAW JD, RYAN PG, TREASURE AM, MCCLELLAND GTW, MCGEOCH MA, CHOWN SL. Human activities, propagule pressure and alien plants in the sub-Antarctic: Tests of generalities and evidence in support of management. *Biological Conservation* 2013; 161: 18–27.

LE ROUX PC, SHAW JD, CHOWN SL. Ontogenetic shifts in plant interactions vary with environmental severity and affect population structure. *New Phytologist* 2013; **200** : 241-250.

LÉE JE, LE ROUX PC, MEIKLEJOHN KI, CHOWN SL. Species distribution modelling in low-interaction environments: Insights from a terrestrial Antarctic system. *Austral Ecology* 2013; **38** : 279–288.

LEUNG B, ROURA-PASCUAL N, BACHER S, HEIKKILÄ J, BROTONS L, BURGMAN M, DEHNEN-SCHMUTZ K, ESSL F, HULME PE, RICHARDSON DM, SOL D, VILÀ M.Addressing a critique of the TEASI

framework for invasive species risk assessment. *Ecology Letters* 2013; 16 : 1415–e6. LEVY A, VON DER HEYDEN S, FLOETER SR, BERNARDI G, ALMADA VC. Phylogeny of *Parablennius* Miranda Ribeiro, 1915 reveals a

paraphyletic genus and recent Indo-Pacific diversification from an Atlantic ancestor. Molecular Phylogenetics and Evolution 2013; **67** : 1–8.

LOTZ CN, CADDICK JA, FORNER M, CHERRY MI. Beyond just species: Is Africa the most taxonomically diverse bird continent?. South African Journal of Science 2013; 109 (5/6) :Art.#0002.

LYONS CL, COETZEE M, CHOWN SL. Stable and fluctuating temperature effects on the development rate and survival of two malaria vectors, *Anopheles*

arabiensis and Anopheles funestus. Parasites & Vectors 2013; **6** :Art. 104. **MEASEY GJ, TOLLEY KA**. A molecular phylogeny for sub-Saharan amphisbaenians. African Journal of Herpetology 2013; **62** : 100-108.

MEEK CS, RICHARDSON DM, MUCINA L. Plant communities along the Eerste River, Western Cape, South Africa: Community descriptions and implications for restoration. *Koedoe* 2013; **55** (1): Art.#1099.

MOLES AT, PECO B, WALLIS IR, FOLEY WJ, POORE AGB, SEABLOOM EW, VESK P, BISIGATO AJ, CELLA-PIZARRO L, CLARK CJ, COHEN PS, CORNWELL WK, EDWARDS W, EJRNÆS R, GONZALES-OJEDA T, GRAAE BJ, HAY G, LUMBWE FC,

VELDTMAN R, ET AL. Correlations between physical and chemical defences in plants: tradeoffs, syndromes, or just many different ways to skin a herbivorous cat? New Phytologist 2013; 198 : 252–263.

MONADJEM A, RICHARDS LR, TAYLOR PJ, DENYS C, DOWER A, STOFFBERG S. Diversity of Hipposideridae in the Mount Nimba massif, West Africa, and the taxonomic status of *Hipposideros lamottei*. Acta Chiropterologica 2013; 15(2): 341–352.

MONADJEM A, RICHARDS LR, TAYLOR PJ, STOFFBERG S. High diversity of pipistrelloid bats (Vespertilionidae: *Hypsugo, Neoromicia*, and *Pipistrellus*) in a West African rainforest with the description of a new species. *Zoological Journal of the Linnean Society* 2013; **167** : 191–207.

MOODLEY D, GEERTS S, RICHARDSON DM, WILSON JRU. Different traits determine introduction, naturalization and invasion success in woody plants: Proteaceae as a test case. *PLoS ONE* 2013; 8 : e75078.

MOORE AE, BLENKINSOP T, COTTERILL FPD. Dynamic evolution of the Zambezi-Limpopo watershed, Central Zimbabwe. South African Journal of Geology 2012; **115**:551-560.

MOORE AE, COTTERILL FPD, ECKARDT FD. The evolution and ages of Makgadikgadi palaeo-lakes: Consilient evidence from Kalahari drainage evolution south-central Africa. South African Journal of Geology 2012; 115 : 385-413. MORTIMER PE, LE ROUX MR, PÉREZ-FERNÁNDEZ MA,

BENEDITO VA, KLEINERT A, XU J, VALENTINE AJ. The dual symbiosis between arbuscular mycorrhiza and nitrogen fixing bacteria benefits the growth and nutrition of the woody invasive legume *Acacia cyclops* under nutrient limiting conditions. *Plant and Soil* 2013; **366** : 229–241.

MÜLLEROVÁ J, PERGL J, PYŠEK P. Remote sensing as a tool for monitoring plant invasions: Testing the effects of data resolution and image classification approach on the detection of a model plant species *Heracleum mantegazzianum* (giant hogweed). *International Journal of Applied Earth Observation and Geoinformation* 2013; 25 : 55–65. NDLOVU J, RICHARDSON DM, WILSON JRU, LE ROUX JJ. Coinvasion of South African ecosystems by an Australian legume and its rhizobial

symbionts. Journal of Biogeography 2013, 40 : 1240–1251. NDLOVU J, RICHARDSON DM, WILSON JRU, O'LEARY M, LE ROUX

JJ. Elucidating the native sources of an invasive tree species, *Acacia pycnantha*, reveals unexpected native range diversity and structure. *Annals of Botany* 2013; 111:895–904. **NEL JAJ, LOUTIT RJ, BRABY R, SOMERS MJ**. Resource dispersion,

territory size and group size of black-backed jackals on a desert coast. *Acta Theriologica* 2013; **58** : 189–197. **NOVOA A, GONZALEZ L, MORAVCOVA L, PYŠEK P**. Constraints to

adve plant species establishment in coastal dune communities invaded by *Carpobrotus* edulis: Implications for restoration. *Biological Conservation* 2013; **164** : 1–9. NYAMUKONDIWA C, WELDON CW, CHOWN SL, LE ROUX PC,

TERBLANCHE JS. Thermal biology, population fluctuations and implications of temperature extremes for the management of two globally significant insect pests. *Journal of Insect Physiology* 2013; **59**:1199–1211.

NYANGIWE N, MATTHEE CA, HORAK IG, MATTHEE S. First record of the pantropical blue tick *Rhipicephalus microplus* in Namibia. *Experimental and Applied Acarology* 2013; **61** : 503-507.

OLIVIER D, HEINECKEN L, JACKSON S. Mussel and oyster culture in Saldanha Bay, South Africa: potential for sustainable growth, development and employment creation. *Food Security* 2013; **5** : 251–267.

PATERSON RA, PRITCHARD DW, DICK JT, ALEXANDER ME, HATCHER M, DUNN A. Predator cue studies reveal strong trait-mediated effects in communities despite variation in experimental designs. *Animal Behaviour* 2013; **86** : 1301-1313.

PAUW A. Can pollination niches facilitate plant coexistence? Trends in Ecology & Evolution 2013; **28**(1) : 30-37.

PHIRI EE, DANIELS SR. Hidden in the highlands: the description and phylogenetic position of a novel endemic freshwater crab species (Potamonautidae : *Potamonautes*) from Zimbabwe. *Invertebrate Systematics* 2013; **27** : 530–539.

PYŠEK P, HULME PE, MEYERSON LA, SMITH GF, BOATWRIGHT JS, CROUCH NR, FIGUEIREDO E, FOXCROFT LC, JAROŠÍK V, RICHARDSON DM, SUDA J, WILSON JRU. Hitting the right target: taxonomic challenges for and of plant invasions. *AoB Plants* 2013: **5** : Plt042.

REINECKE AJ, REINECKE SA. Hou metaalbesoedeling 'n bedreiging in vir die voortbestaan van seesterre in Valsbaai, Suid-Afrika? South African Journal for Science and Technology 2013; 32(1): Art.#394.

REJMÁNEK M, RICHARDSON DM. Trees and shrubs as invasive alien species – 2013 update of the global database. *Diversity and Distributions* 2013; **19** : 1093–1094. **RICHARDSON DM, RICCIARDI A.** Misleading criticisms of invasion science: a field guide. *Diversity and Distributions* 2013; **19** : 1461–1467.

ROETS F, OBERLANDER KC, DREYER LL. Two new *Oxalis* species (*Oxalidaceae*) from the Ai-Ais / Richtersveld Transfrontier Park, South Africa. Blumea

2013; **57** : 229–235.

RUHBERG H, DANIELS SR. Morphological assessment supports the recognition of four novel species in the widely distributed velvet worm *Peripatopsis moseleyi sensu lato* (Onychophora : Peripatopsidae). *Invertebrate Systematics* 2013; 27 : 131–145.

RUSCH UD, MIDGLEY JJ, ANDERSON BC. Rodent consumption and caching behaviour selects for specific seed traits. *South African Journal of Botany* 2013; 84:83-87.

RUSH U, MIDGLEY JJ, ANDERSON BC. Competing seed consumers drive the evolution of scatter-hoarding: Why rodents do not put all their seeds in one larder. *African Zoology* 2013; **48** : 152-158.

RUTHERFORD MC, POWRIE LW. Impacts of heavy grazing on plant species richness: A comparison across rangeland biomes of South Africa. *South African Journal* of Botany 2013; **87** : 146–156.

RUWANZA S, GAERTNER M, ESLER KJ, RICHARDSON DM. Both complete clearing and thinning of invasive trees lead to short-term recovery of native riparian vegetation in the Western Cape, South Africa. *Applied Vegetation Science* 2013; **16** : 193-204.

RUWANZA S, GAERTNER M, ESLER KJ, RICHARDSON DM. The effectiveness of active and passive restoration on recovery of indigenous vegetation in riparian zones in the Western Cape, South Africa: A preliminary assessment. *South African Journal of Botany* 2013; **88** : 132-141.

RUWANZA S, GAERTNER M, RICHARDSON DM, ESLER KJ. Soil water repellency in riparian systems invaded by *Eucalyptus camaldulensis*: A restoration perspective from the Western Cape Province, South Africa. *Geoderma* 2013; **200-201**: 9-17.

SCHNEIDER SA, GILIOMEE JH, DOOLEY JW, NORMARK BB. Mutualism between armoured scale insects and ants: new species and observations on a unique trophobiosis (Hemiptera: Diaspididae; Hymenoptera: Formicidae: *Melissotarsus* Emery). Systematic Entomology 2013; **38** : 805-817.

SCHOEMAN MC, COTTERILL FPD, TAYLOR PJ, MONADJEM A. Using potential distributions to explore environmental correlates of bat species richness in southern Africa: Effects of model selection and taxonomy. *Current Zoology* 2013; 59: 279-293.

SCHOOMBIE RE, BOARDMAN L, GROENEWALD B, GLAZIER DS, VAN DAALEN CE, CLUSELLA-TRULLAS S, TERBLANCHE JS. High metabolic and water-loss rates in caterpillar aggregations: evidence against the resourceconservation hypothesis. *Journal of Experimental Biology* 2013; **216** : 4321-4325. SEGALL M, TOLLEY KA, VANHOOYDONCK B, MEASEY GJ,

HERREL A. Impact of temperature on performance in two species of South African dwarf chameleon, Bradypodion pumilum and B. occidentale. Journal of Experimental Biology 2013; 216 : 3828-3836.

SEGURA J, FERRETTI L, RAMOS-ONSINS S, CAPILLA L, FARRÉ M, REIS F, OLIVER-BONET M, FERNANDEZ-BELLON H, GARCÍA F, GARCIA-CALDES M, ROBINSON TJ, RUIZ-HERRERA A. Evolution of recombination in eutherian mammals: insights into mechanisms that affect

recombination rates and crossover interference. Proceedings of the Royal Society B – Biological Sciences 2013; 280 : 20131945.

SHARPE LL, HILL A, CHERRY MI. Individual recognition in a wild cooperative mammal using contact calls. *Animal Behaviour* 2013; **86** : 893-900.

SHUTTLEWORTH C, MOUTON PLN, VAN NIEKERK A. Climate and the evolution of group-living behaviour in the armadillo lizard (*Ouroborus cataphractus*). *African Zoology* 2013; **48** : 367–373.

SPEAR D, FOXCROFT LC, BEZUIDENHOUT H, MCGEOCH MA. Human population density explains alien species richness in protected areas. *Biological Conservation* 2013; **159** : 137–147.

STÂNGBERG F, ELLIS AG, ANDERBERG AA. Evolutionary relationships in Gorteria: A re-evaluation. Taxon 2013; 62 : 537–549.

SUDA J, KREJCIKOVA J, SUDOVÁ R, OBERLANDER KC, DREYER LL. Two new species of *Oxalis* (Oxalidaceae) from the Greater Cape Floristic Region. *Phytotaxa* 2013; **124**(1): 13-24.

TERERAI F, GAERTNER M, JACOBS SM, RICHARDSON DM. Eucalyptus invasions in riparian forests: Effects on native vegetation community diversity, stand structure and composition. Forest Ecology and Management 2013; **297** : 84–93.

TOLLEY KA, TOWNSEND TM, VENCES M. Large-scale phylogeny of chameleons suggests African origins and Eocene diversification. *Proceedings of the Royal Society B – Biological Sciences* 2013; **280** : 20130184.

TREASURE AM, CHOWN SL. Contingent absences account for range limits but not the local abundance structure of an invasive springtail. *Ecography* 2013; **36** : 146–156.

TREASURE AM, MOLONEY C, BESTER MN, MCQUAID CD, FINDLAY KP, BEST PB, COWAN DA, DE BRUYN PJN, DORRINGTON RA, FAGERENG A, FRONEMAN PW, GRANTHAM GH, HUNT BPV, MEIKLEJOHN KI, PAKHOMOV E, ROYCHOUDHURY AN, RYAN PG, SMITH VR, CHOWN SL,

ANSORGE IJ. South African research in the Southern Ocean: New opportunities but serious challenges. South African Journal of Science 2013; **109**(3/4) :Art. #a009. **VAN DEN HEUVEL IM, CHERRY MI, KLUMP GM**. Individual identity, song repertoire and duet function in the Crimson-breasted Shrike (*Laniarius atrococcineus*). *Bioacoustics – The International Journal of Animal Sound and Its Recording* 2013; **22** : 1–15. **VAN HEERDEN J, TAYLOR PJ, VAN HEERDEN CJ.** Genetic differentiation in Horus Chamberlin (Arachnida: Pseudoscorpiones: Olpiidae) as indicated by mitochondrial DNA analysis. *African Zoology* 2013; **48**(2) : 351-358. VAN WILGEN BW, MORAN VC, HOFFMANN JH. Some Perspectives on the Risks and Benefits of Biological Control of Invasive Alien Plants in the Management of Natural Ecosystems. *Environmental Management* 2013; **52**:531-540.

VAN WILGEN BW. Fire management in species-rich Cape fynbos shrublands. Frontiers in Ecology and the Environment 2013; 11(1):e35-e44.

VARDIEN W, RICHARDSON DM, FOXCROFT LC, WILSON JRU, LE ROUX JJ. Management history determines gene flow in a prominent invader. Ecography 2013; 36 : 1032–1041.

VOUA OTOMO P, REINECKE SA, REINECKE AJ. Combined effects of metal contamination and temperature on the potworm *Enchytraeus doerjesi* (Oligochaeta). *Journal of Applied Toxicology* 2013; **33** : 1520–1524.

WELDON CW, DANIELS SR, CLUSELLA-TRULLAS S, CHOWN SL. Metabolic and water loss rates of two cryptic species in the African velvet worm genus Opisthopatus (Onychophora). Journal of Comparative Physiology B-Biochemical Systemic and Environmental Physiology 2013; **183** : 323–332.

WESTER P. Sunbirds hover at flowers of Salvia and Lycium. Ostrich 2013; 84 : 27–32. WILSON JRU, IVEY P, MANYAMA P, NÄNNI I. A new national unit for invasive species detection, assessment and eradication planning. South African Journal of Science 2013; 109(5/6) : Art:#0111.

WOODFORD DJ, HUI C, RICHARDSON DM, WEYL OLF. Propagule pressure drives establishment of introduced freshwater fish: quantitative evidence from an irrigation network. *Ecological Applications* 2013; 23 : 1926–1937.

YUE D, GUO D, HUI C. Scale dependency of biocapacity and the fallacy of unsustainable development. *Journal of Environmental Management* 2013; **126**: 13-19. **ZHANG F, HUI C, PAUW A**. Adaptive divergence in Darwin's race: How coevolution can generate trait diversity in a pollination system. *Evolution* 2013; **67**: 548–560.

ZHAO Z, HUI C, HE DA-HAN, GE F. Effects of position within wheat field and adjacent habitats on the density and diversity of cereal aphids and their natural enemies. *Biocontrol* 2013; **58** : 765-776.

ZHAO Z, HUI C, OUYANG F, LIU J-H, GUAN X-Q, HE D-H, GE F. Effects of inter-annual landscape change on interactions between cereal aphids and their natural enemies. *Basic and Applied Ecology* 2013; **14** : 472–479.

ZHAO Z, SHI P-J, HUI C, OUYANG F, GE F, LI B-L. Solving the pitfalls of pitfall trapping: a two-circle method for density estimation of ground-dwelling arthropods. *Methods in Ecology and Evolution* 2013; **4** : 865–871.

ZONYANE S, VAN VUUREN SF, MAKUNGA NP. Antimicrobial interactions of Khoi-San poly-herbal remedies with emphasis on the combination; *Agathosma crenulata*, *Dodonaea viscosa* and *Eucalyptus globulus*. *Journal of Ethnopharmacology* 2013; **148** : 144–151.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

BARBOUR JH, MCMENAMIN S, DICK JTA, ALEXANDER ME, CAFFREY J. Biosecurity measures to reduce secondary spread of the invasive freshwater Asian clam, *Corbicula fluminea* (Müller, 1774). *Management of Biological Invasions* 2013; 4 : 219–230.

COTTERILL FPD, AUGUSTIN H, MEDICUS R, FOISSNER W. Conservation of Protists: The Krauthügel Pond in Austria. Diversity 2013; **5** : 374-392. FOGELL DJ, TOLLEY KA, MEASEY GJ. Mind the gaps: investigating the cause of the current range disjunction in the Cape Platanna, Xenopus gilli (Anura: Pipidae). PeerJ 2013; **1** : e166-189.

GILDENHUYS E, ELLIS AG, CARROLL SP, LE ROUX JJ. The ecology, biogeography, history and future of two globally important weeds: *Cardiospermum* halicacabum Linn. and C. grandiflorum Sw. . NeoBiota 2013; **19** : 45–65.

JOHNSON T, GILIOMEE JH. Practical problems and their solutions in studying the biology of the mealybug *Paracoccus burnerae* (Brain) (Hemiptera: Pseudococcidae). *African Journal of Biotechnology* 2013; 12 : 3609-3614.

MACNEIL C, DICK JTÄ, ALEXANDER ME, DODD JA, RICCIARDI A. Predators vs. alien: differential biotic resistance to an invasive species by two resident predators. *NeoBiota* 2013; **19** : 1–19.

MCCLELLAND GTW, COOPER J, CHOWN SL. Evidence of breeding by diving petrels and storm petrels at Marion Island after the eradication of feral cats. *Ornithological Observations, BirdLife South Africa* 2013; **4** : 90 - 93.

PLIENINGER T, GAERTNER M, HUI C, HUNTSINGER L. Does land abandonment decrease species richness and abundance of plants and animals in Mediterranean pastures, arable lands and permanent croplands? *Environmental Evidence* 2013: **2**: 1-7.

RICHARDSON DM. Lessons learned: how can we manage the invasion risk from biofuels? *Biofuels* 2013; 4(5) : 455–457.

VON DER HEYDEN S, GILDENHUYS E, BERNARDI G, BOWIE RCK. Fine-scale biogeography: tidal elevation strongly affects population genetic structure and demographic history in intertidal fishes. *Frontiers of Biogeography* 2013; **5**(1) : 29-38.

Verrigtinge internasionaal | Proceedings international

VON DER HEYDEN S. Linking sea level change, habitat availability and population genetics of marine species in southern Africa. Workshop on the Biogeography and Phylogeography of Atlantic Fish, Instituto Superior de Psicologia Aplicada, Lisbon, Portugal, Frontiers in Biogeography 2011: 14.

Hoofstukke in boeke | Chapters in books

BARET S, BAIDER C, KUEFFER C, FOXCROFT LC, LAGABRIELLE E.

Threats to paradise? Plant invasions in protected areas of the western Indian Ocean Islands. In *Plant Invasions in Protected Areas: Patterns, Problems and Challenges*, Springer, Germany, 2013: 423-447.

COLLING J, POLLIER J, MAKUNGA NP, GOOSSENS A. cDNA-AFLP-Based Transcript Profiling for Genome-Wide Expression Analysis of Jasmonate-Treated Plants and Plant Cultures. In Jasmonate Signaling: Methods and Protocols IN Methods in Molecular Biology Volume 1011. Eds. A. Goosens and L. Pauwels, Springer, New York, USA, 2013: 287-303.

FOXCROFT LC, PYŠEK P, RICHARDSON DM, PERGL J, HULME PE. The bottom line: Impact of alien plant invasions in protected areas. In *Plant Invasions in Protected Areas: Patterns, Problems and Challenges, Springer, Berlin, Germany, 2013: 19-42.* FOXCROFT LC, RICHARDSON DM, PYŠEK P, GENOVESI P. Invasive alien plants in protected areas: Threats, opportunities, and the way forward. In *Plant Invasions in Protected Areas: Patterns, Problems and Challenges, Springer, Berlin, Germany,* 2013: 621-639.

FOXCROFT LC, RICHARDSON DM, PYŠEK P, GENOVESI P. Plant invasions in protected areas: Outlining the issues and creating the links. In *Plant Invasions in Protected Areas: Patterns, Problems and Challenges*, Springer, Berlin, Germany, 2013: 3-18.

FOXCROFT LC, WITT A, LOTTER WD. Icons in Peril: Invasive alien plants in African protested areas. In *Plant Invasions in Protected Areas: Patterns, Problems and Challenges*, Springer, Germany, 2013: 117-143.

HUIC, FOXCROFT LC, RICHARDSON DM, MACFADYEN S.A crossscale approach for abundance estimation of invasive alien plants in a large protected area. In Plant Invasions in Protected Areas: Patterns, Problems and Challenges, Springer, Berlin, Germany, 2013: 73-88.

LOVERIDGE AJ, NEL JAJ. Canis mesomelas Black-backed Jackal (Silver-backed Jackal). In Mammals of Africa Volume V Carnivores, Pangolins, Equids and Rhinoceroses Ed. Jonathan Kingdon and Michael Hoffmann, Bloomsbury, London, United Kingdom, 2013: 39-44.

MASCARO J, HARRIS JA, LACH L, THOMPSON A, PERRING MP, RICHARDSON DM, ELLIS EC. Origins of the Novel Ecosystems Concept. In Novel Ecosystems: Intervening in the New Ecological World Order, First Edition. Eds. Richard J. Hobbs, Eric S. Higgs and Carol M. Hall, Wiley-Blackwell, Chichester, United Kingdom, 2013: 45-57.

NEL JAJ, MAAS B. Otocyon megalotis Bat-eared Fox. In Mammals of Africa Volume V Carnivores, Pangolins, Equids and Rhinoceroses Ed. Jonathan Kingdon and Michael Hoffmann, Bloomsbury, London, United Kingdom, 2013: 78-81.

NEL JAJ, SOMERS MJ. GENUS Aonyx Cawless Otters. In Mammals of Africa Volume V Carnivores, Pangolins, Equids and Rhinoceroses Ed. Jonathan Kingdon and Michael Hoffmann, Bloomsbury, London, United Kingdom, 2013: 103.

NEL JAJ, STUART C, STUART T. Vulpes chama Cap Fox (Silver Fox). In Mammals of Africa Volume V Carnivores, Pangolins, Equids and Rhinoceroses Ed. Jonathan Kingdon and Michael Hoffmann, Bloomsbury, London, United Kingdom, 2013: 62-65. NEL JAJ. Desmodillus auricularis Cape Short-Tailed Gerbil (Namaqua Gerbil). In

Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 266-268.

NEL JAJ. Thallomys nigricauda Black-tailed Acacia Rat (Black-Tailed Thallomys). In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 559-560.

NEL JAJ. Thallomys paedulcus Sundevall's Acacia Rat (Acacia Thallomys). In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 559-560.

NEL JAJ. Zeltomys hildegardeae Hildegarde's Broad-Headed Mouse (Hildegarde's Zeltomys). In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 568-569.

NEL JAJ. Zeltomys woosnami Woosnam's Broad-Headed Mouse (Woosnam's Zeltomys). In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 569-571.

NEL JAJ. GENUS Desmodillus Cape Short-tailed Gerbil. In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 266.

NEL JAJ. GENUS Otocyon Bat-eared Fox. In Mammals of Africa Volume V Carnivores, Pangolins, Equids and Rhinoceroses Ed. Jonathan Kingdon and Michael Hoffmann, Bloomsbury, London, United Kingdom, 2013: 77.

NEL JAJ. GENUS Thamnomys Thicket Rats. In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 562-563.

NEL JAJ. GENUS Zeltomys Broad-Headed Mice. In Mammals of Africa Volume III Rodents, Hares and Rabbits Ed. David Happold, Bloomsbury, London, United Kingdom, 2013: 567-568.

OLIVER EGH, CLABEN-BOCKHOFF R. Bruniaceae. In Plants of the Greater Cape Floristic Regions 1: The Core Cape Flora Chapter 29, Strelitzia. South African National Biodiversity Institute. Pretoria. South Africa. 2012: 442-448.

OLIVER EGH. Erica. In DA Snijman, Plants of the Greater Cape Floristic Region 2: the Extra Cape flora, Strelitzia. South African National Biodiversity Institute, Pretoria, South Africa, 2013: 371.

OLIVER EGH. Erica. In J Manning & P Goldblatt, Plants of the Greater Cape Floristic Region 1:The Core Cape Flora, Strelitzia. South African National Biodiversity Institute, Pretoria, South Africa, 2012: 482-551.

PAUW A. Pollination by oil-collecting bees (Rediviva: Melittidae). In *The Cape* Orchids: A Regional monograph of the Orchids of the Cape Floristic Region. Volume I. Eds. William R. Liltved & Steven D. Johnson, Sandstone Editions, Cape Town, South Africa, 2012: 91-99. **POOL-STANVLIET R, GILIOMEE JH**. A Sustainable Development Model for the Wine Lands of the Western Cape: A case study of the Cape Winelands Biosphere Reserve. In *AfriMAB Biosphere Reserves in sub-Saharan Africa: Showcasing sustainable development*, Department of Environmental Affairs & UNESCO, Pretoria, South Africa, 2013: 45-72.

REJMÁNEK M, RICHARDSON DM. Plant Invasions and Invasibility of Plant Communities. In *Vegetation Ecology, 2nd Edition. Eds. van der Maarel, E. & Franklin, J*, John Wiley & Sons, Ltd, Oxford, United Kingdom, 2013: 387-424.

RICHARDSON DM, GAERTNER M. Plant Invasions as Builders and Shapers of Novel Ecosystems. In Novel Ecosystems: Intervening in the New Ecological World Order, First Edition. Eds. Richard J. Hobbs, Eric S. Higgs and Carol M. Hall, Wiley-Blackwell, Chichester; United Kingdom, 2013: 102-114.

RICHARDSON DM, PYŠEK P. Plant Invasions. In Encyclopedia of Biodiversity, 2nd Edition, Volume 6. Ed. SA Levin, Academic Press, Waltham, USA, 2013: 90-102.

ROETS F, DREYER LL, WINGFIELD MJ, CROUS PW. The taxonomy and ecology of *Protea*-associated Ophiostomatoid fungi – a review of current knowledge. In *CBS Biodiversity Series 12. The Ophiostomatoid Fungi: Expanding Frontiers*, CBS-KNAW Fungal Biodiversity Centre, Utrecht, Netherlands, 2013: 177-187.

SOMERS MJ, NEL JAJ. Aonyx capensis African Clawless Otter. In Mammals of Africa Volume V Carnivores, Pangolins, Equids and Rhinoceroses Ed. Jonathan Kingdon and Michael Hoffmann, Bloomsbury, London, United Kingdom, 2013: 104-108.

STOHLGREN TJ, PYŠEK P, KARTESZ J, NISHINO M, PAUCHARD A, WINTER M, PINO J, RICHARDSON DM, WILSON JRU, MURRAY BR, PHILLIPS ML, CELESTI-GRAPOW L, GRAHAM J. Globalization Effects on Common Plant Species. In *Encyclopedia of Biodiversity, second edition, Volume 3. Ed. Simon A. Levin, Academic Press Elsevier, New York, USA, 2013: 700-706.*

 VALENTINE AJ, MORTIMER PE, KLEINERT A, KANG Y, BENEDITO
 VA. Carbon Metabolism and Costs of Arbuscular Mycorrhizal Associations to Host Roots. In Symbiotic Endophytes. Vol 37. Ed. Ricardo Aroca, Springer-Verlag Berlin Heidelberg, Berlin, Germany, 2013: 233-252.

VALENTINE AJ, RUZVIDZO O, KLEINERT A, KANG Y, BENEDITO VA. Infrared Gas Analysis Technique for the Study of the Regulation of Photosynthetic Responses. In Methods in Molecular Biology 1016: Cyclic Nuceotide Signaling in Plants, Methods and Protocols. Ed. Chris Gehring, Humana Press Springer Science & Business Media, New York, USA, 2013: 261-273.

Doktoraal afgehandel | Doctoral completed

COETZEE BWT. Species assembly patterns and protected area effectiveness in times of change: a focus on African avifauna. PhD, 2013. 200 pp. Promotor: Chown SL. **DE JAGER ML**. Phylogeographic and behavioural variation in a pollinator as a driver of floral divergence in the beetle daisy, Gorteria diffusa (Asteraceae). PhD, 2013. 200 pp. Promotor: Ellis AG.

DU TOIT N. *Phylogeographic structures of* Rhabdomys pumilio *and its associated ectoparasites*. PhD, 2013. 142 pp. Promotor: Matthee CA. Medepromotor: Jansen van Vuuren B, Matthee S.

EDWARDS S. Patterns and processes of adaptation in Lacertid Lizards to environments in Southern Africa. PhD, 2013. 131 pp. Promotor: Tolley KA. Medepromotor: Mouton PLN. JANION C. Springtail diversity in the Cape Floristic Region. PhD, 2013. 321 pp. Promotor: Chown SL. Medepromotor: Bengtsson J, Deharveng L.

LYONS CL. Physiological ecology and the future distributions of two malaria vectors – Anopheles arabiensis and Anopheles funestus. PhD, 2013. 212 pp. Promotor: Chown SL. Medepromotor: Coetzee M, Terblanche JS.

MCCLELLAND GTW. Ecology of the Black-faced Sheathbill on Marion Island. PhD, 2013. 307 pp. Promotor: Chown SL. Medepromotor: Altwegg R.

MOTHAPO NP. Effects of biotic resistance and resource availability on the invasion success of the Argentine ant, Linepithema humile (Mayr), in the Cape Floristic Region, South Africa. PhD, 2013. 142 pp. Promotor:Wossler TC.

MUSARURWA HT. Effects of over-expressing AgGPPS2 gene in Salvia stenophylla (Burch. ex Benth) on terpenoid biosynthesis. PhD, 2013. 196 pp. Promotor: Makunga NP. MUTEVERIT. The effect of Pleistocene climatic changes on the evolutionary history of Southern African intertidal gastropods. PhD, 2013. 151 pp. Promotor: Matthee CA. Medepromotor:Von der Heyden S.

NDLOVU J. The invasion ecology of Acacia pygnantha: A genetic approach. PhD, 2013. 148 pp. Promotor: Richardson DM. Medepromotor: Wilson JRU.

REKENAARWETENSKAP • COMPUTER SCIENCE

Tydskrifartikels (gesubsidieer) | |ournal articles (subsidised)

BADKOBEH G, FICI G, KROON RS, LIPT'AK Z. Binary jumbled string matching for highly run-length compressible texts. *Information Processing Letters* 2013; **113**(17): 604-608.

PASAREANU CS, VISSER W, BUSHNELL D, GELDENHUYS J, MEHLITZ P, RUNGTA N. Symbolic PathFinder: integrating symbolic execution with model checking for Java bytecode analysis. *Automated Software Engineering* 2013; 20(3): 391-425.

Verrigtinge nasionaal | Proceedings national

BERGLUND M, BJORKLUND J, DREWES F, VAN DER MERWE AB, WATSON B. *Cuts in regular expressions*. Developments in Language Theory, the 17th International Conference, 2013, Université Paris-Est, Marne-Ia-Vallée, France, Springer 2013: 70-81 BUYS J, VAN DER MERWE AB. A tree transducer model for grammatical error correction. Seventeenth Conference on Computational Natural Language Learning (CoNLL-2013), National Palace of Culture, Plaza Bulgaria, Sofia, Bulgaria, Association for Computational Linguistics (ACL) 2013: 43-51.

FILIERI A, PASAREANU CS, VISSER W. Reliability analysis in symbolic pathfinder. Proceedings of the 35th International Conference on Software Engineering(ICSE 2013), Hyatt Regency, San Francisco, California, USA, IEEE Press 2013; 622-631.

FISCHER B, INVERSO O, PARLATO G. CSeq:A concurrency pre-processor for sequential C verification tools. 28th IEEE/ ACM International Conference, Automated Software Engineering (ASE), Crowne Plaza Cabana in Palo Alto, Silicon Valley, California, USA, 2013: 710-713.

FISCHER B, INVERSO O, PARLATO G. CSeq:A sequentialization tool for C (Competition Contribution). 19th International Conference in Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2013), Rome, Italy, Rome, Italy, Springer 2013: 616-618.

GELDENHUYS J, AGUIRRE N, FRIAS MF, VISSER W. Bounded lazy initialization. NASA Formal Methods Symposium, Moffett Field, CA, USA, California, USA, Springer 2013: 229-243.

GOEBEL J, KRZESINSKI AES. A model of self deployment to maximise area coverage in sensor networks. Proceedings Australasian Telecommunication Networks and Applications Conference ATNAC 2013, Melbourne Convention and Exhibition Centre, Christchurch, New Zealand, ATNAC 2013:7-12.

HISLOP GW, ARDIS M, BUDGEN D, SEBERN MJ, OFFUT J, VISSER W. Revision of the SE 2004 curriculum model. SIGCSE '13 Proceeding of the 44th ACM technical symposium on Computer science education, Sheraton Denver Downtown, Denver, Colorado, USA, ACM SIGCSE 2013: 383-384.

MORSE J, CORDEIRO L, NICOLE D, FISCHER B. Handling unbounded loops with ESBMC 1.20 (competition contribution). 19th International Conference in Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2013), Rome, Italy, Springer 2013:619-622.

RAMALHO M, FREITAS M, SOUSA F, MARQUES H, CORDEIRO L, FISCHER B. SMT-based bounded model checking of C++ programs. 20th Annual IEEE International Conference and Workshops on the Engineering of Computer Based Systems (ECBS), SkySong Convergence, Pheonix, Arizona, USA, Conference Publishing Services 2013: 147-267.

VAN DER MERWE AB, FARAG M, GELDENHUYS J. Counting minimal symmetric difference NFAs. 7th International Conference, Language and Automata Theory and Applications. School of Informatics of Complutense University, Madrid, Spain, Springer 2013: 419-430.

VAN TONDER R, VISSER W. Firegaze: Processing and visualizing firewall logs in the cloud. SATNAC 2013, Spier Wine Estate, Stellenbosch, South Africa, SATNAC 2013: 167-172.

Verrigtinge nasionaal | Proceedings national

KRZESINSKI AES. Flow allocation in wireless networks with selfish nodes. The Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2013, Spier Wine Estate, Stellenbosch, Cape Town, South Africa, SATNAC 2013: 285-290.

Hoofstukke in boeke | Chapters in books

VAN DER MERWE AB. Minimal weighted automata over the galois field with two elements. In *Formal Aspects of Computing*, Shaker Verlag, Aachen, Germany, 2013: 59-75. VAN ZIJL L, GELDENHUYS J. Symmetric difference NFAs: the state of the art. In *Formal Aspects of Computing*, Shaker Verlag, Aachen, Germany, 2013: 77-92.

SUID-AFRIKAANSE SENTRUM VIR EPIDEMIOLOGIESE MODELLERING EN ANALISE / SOUTH AFRICAN CENTRE FOR EPIDEMIOLOGICAL MODELLING & ANALYSIS (SACEMA)

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

BEAUCLAIR R, DELVA W. Is Younger Really Safer? A Qualitative Study of Perceived Risks and Benefits of Age-Disparate Relationships among Women in Cape Town, South Africa. *PLoS ONE* 2013; **8**(11): e81748.

BEAUCLAIR R, MENG F, DEPREZ N, TEMMERMAN M, WELTE A, HENS N, DELVA W. Evaluating audio computer assisted self-interviews in urban South African communities: evidence for good suitability and reduced social desirability bias of a cross-sectional survey on sexual behaviour. *BMC Medical Research Methodology* 2013; **13**(11) : 1-7.

BELLAN SE, FIORELLA KJ, MELESSE DY, GETZ WM, WILLIAMS BG, DUSHOFF J. Extra-couple HIV transmission in sub-Saharan Africa: a Mathematical modelling study of survey data. *Lancet* 2013; **381** : 1561-1569. CLAASSENS M, VAN SCHALKWYK C, DEN HAAN L, FLOYD S, DUNBAR R, VAN HELDEN PD, GODFREY-FAUSSETT P, AYLES H, BORGDORFF MW, ENARSON DA, BEYERS N. High prevalence of tuberculosis and insufficient case detection in two communities in the Western Cape, South Africa. *PLoS ONE* 2013; **8**(4) : e58689.

CLAASSENS MM, VAN SCHALKWYK C, DU TOIT E, ROEST E, LOMBARD CJ, ENARSON DA, BEYERS N, BORGDORFF M. Tuberculosis in Healthcare Workers and Infections Control Measures at Primary Healthcare Facilities in South Africa. PLoS ONE 2013; 8(10) : 1-8. DELVA W, FLEMING Y, CHINGANDU L. When to start ART in Africa –

primarily guided by RCT's or patient autonomy? *Journal of the International Aids Society* 2013; **16** : 18756.

DELVA W, MENG F, BEAUCLAIR R, DEPREZ N, TEMMERMAN M, WELTE A, HENS N. Coital frequency and condom use in monogamous and concurrent sexual relationships in Cape Town, South Africa. *Journal of the International*

Concurrent sexual relationships in Cape Iown, South Africa. *Journal of the International* Aids Society 2013; 16 : 18034. GRANICH R, WILLIAMS B.G, MONTANER JSG. Fifteen million people on

antiretroviral treatment by 2015: treatment as prevention. *Current Opinion in HIV and* AIDS 2013; 8 : 41-49.

HBID ML, SÁNCHEZ E, OUIFKI R. Hopf bifurcation via the Poincaré procedure in delay-differential equations with two delays. *Revista Matematica Complutense* 2013; **26**(1): 193-213.

KATO M, GRANICH R, BUI DD, TRAN HV, NADOL P, JACKA D, SABIN K, SUTHAR A, MESQUITA F, LO YR, WILLIAMS B.G. The Potential Impact of Expanding Antiretroviral Therapy and Combination Prevention in Vietnam: Towards Elimination of HIV Transmission. JAIDS-Journal of Acquired Immune Deficiency Syndromes 2013: 63(5) : E142-E149.

KAZEEM OO, OUIFKI R, NIZAR M. Optimal control strategies and costeffectiveness analysis of a malaria model. *Biosystems* 2013; 111 : 83-101.

KEEBLER DS, WALWYN D, WELTE A. Biology as Population Dynamics: Heuristics for Transmission Risk. *American Journal of Reproductive Immunology* 2013; **69**(Suppl 1): 88-94.

LIMA VD, GRANICH R, PHILLIPS P, WILLIAMS B.G, MONTANER JSG. Potential Impact of the US President's Emergency Plan for AIDS Relief on the Tuberculosis/HIV Coepidemic in Selected Sub-Saharan African Countries. *Journal of Infectious Diseases* 2013; **208** : 2075-2084.

NOSYK B, AUDOIN B, BEYRER C , CAHN P, GRANICH R, HAVLIR D, KATABIRA E, LANGE J, LIMA VD, PATTERSON T, STRATHDEE SA, WILLIAMS B.G, MONTANER J. Examining the evidence on the causal

effect of HAART on transmission of HIV using the Bradford Hill Criteria. *Aids* 2013; **27**(7): 1159-1165.

OBAID HA, OUIFKI R, PATIDAR KC. An unconditionally stable nonstandard finite difference method applied to a mathematical model of HIV infection.

International Journal of Applied Mathematics and Computer Science 2013; 23(2): 357-372. VALE GA, CHAMISA A, MANGWIRO C, TORR SJ. A Neglected Aspect of the Epidemiology of Sleeping Sickness: The Propensity of the Tsetse Fly Vector to Enter Houses. PloS Neglected Tropical Diseases 2013; 7(2): e2086.

VALE GA, HARGROVE JW, CHAMISA A, HALL DR, MANGWIRO C, TORR SJ. Factors Affecting the Propensity of Tsetse Flies to Enter Houses and Attack Humans Inside: Increased Risk of Sleeping Sickness in Warmer Climates. *PloS Neglected Tropical Diseases* 2013; **7**(4): e2193.

VAN SCHALKWYK C, MNDZEBELE S, HLOPHE T, CALLEJA JMG, KORENROMP EL, STONEBURNER R, PERVILHAC C. Outcomes and Impact of HIV Prevention, ART and TB Programs in Swaziland – Early Evidence from Public Health Triangulation. *PLoS ONE* 2013; 8(7) : e69437.

WLODZIMIROW KA, ESLAMI S, ABU-HANNA A, NIEUWOUDT M, CHAMULEAU RAFM.A systematic review on prognostic indicators of acute on chronic liver failure and their predictive value for mortality. *Liver International* 2013; 33(1):40-52.

SENTRALE ANALITIESE FASILITEIT • CENTRAL ANALYTICAL FACILITY

Tydskrifartikels (gesubsidieerd) | Journal articles (subsidised)

AMPOFO-YEBOAH A, HITEN NF, AFRIYIE-GYAWU E,

LAMBRECHTS H, BRINK D. Analysis of oleanolic acid and ursolic acid, potential antifertility agent in Moringa (Moringa oleifera) seed. *Journal of Agricultural Science and Technology* 2013; **3**(12): 989-999.

CALEB OJ, OPARA LU, MAHAJAN PV, MANLEY M, MOKWENA L, TREDOUX AGJ. Effect of modified atmosphere packaging and storage temperature on volatile composition and postharvest life of minimally-processed pomegranate arils (cvs. 'Acco' and 'Herskawitz'). *Postharvest Biology and Technology* 2013; **79** : 54-61.

DU PLESSIS A, MEINCKEN M, SEIFERT T. Quantitative Determination of Density and Mass of Polymeric Materials Using Microfocus Computed Tomography. *Journal of Nondestructive Evaluation* 2013; **32**(4) :413-417.

DU PLESSIS A, STEYN J, ROBERTS DE, BOTHA LR, BERGER LR.A proof of concept demonstration of the automated laser removal of rock from a fossil using 3D X-ray tomography data. *Journal of Archaeological Science* 2013; 40 : 4607-4611. LORENZ H, GEE DG, KORAGO E, KOVALEVA G, MCCLELLAND

WC, GILOTTI JA, FREI D. Detrital zircon geochronology of Palaeozoic Novaya Zemlya – a key to understanding the basement of the Barents Shelf. *Terra Nova* 2013; 25(6):496-503.

MEINCKEN M, DU PLESSIS A.Visualising and quantifying thermal degradation of wood by computed tomography. *European Journal of Wood and Wood Products* 2013; **71**: 387-389.

MILLER JA, FABER C, ROWE CD, MACEY PH, DU PLESSIS A. Eastward transport of the Monapo Klippe, Mozambique determined from field kinematics and computed tomography and implications for late tectonics in central Gondwana. *Precambrian Research* 2013; **237** : 101-115.

SAO EMANI C, WILLIAMS M, WIID IJF, HITEN NF, VILJOEN A,

PIETERSEN RD, VAN HELDEN PD, BAKER B. Ergothioneine is a secreted antioxidant in Mycobacterium smegmatis. *Antimicrobial Agents and Chemotherapy* 2013; **57**(7): 3202-3207.

VAN HEERDEN J, TAYLOR PJ, VAN HEERDEN CJ. Genetic differentiation in Horus Chamberlin (Arachnida: Pseudoscorpiones: Olpiidae) as indicated by mitochondrial DNA analysis. *African Zoology* 2013; **48**(2) : 351-358.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

MORTON AC, HOUNSLOW MW, FREI D. Heavy-mineral, mineral-chemical and zircon-age constraints on the provenance of Triassic sandstones from the Devon coast, southern Britain. *Geologos* 2013; **19**(1-2):67-85.

SENTRUM VIR MENSLIKE PRESTASIEWETENSKAPPE • CENTRE FOR HUMAN PERFORMANCE SCIENCE

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

MEIRHAEGHE MWJ, VIVIERS PL, KIRBY J-AH, VILJOEN JT. Osteoid osteoma of the fibula in a female rugby player. *South African Journal of Sport Medicine* 2013: **25**(4):114-115.

PATERSON G, VAN DER KAMP J, BRESSAN ES, SAVELSBERGH G. The effects of perception-action coupling on perceptual decision-making in a selfpaced far aiming task. *International Journal of Sport Psychology* 2013; **44** : 179-196.

TOEGEPASTE WISKUNDE • APPLIED MATHEMATICS

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

BANDA MK, HERTY M. Numerical discretization of stabilization problems with boundary controls for systems of hyperbolic conservation laws. *Mathematical Control and Related Fields* 2013; **3**(2):121-142.

DREIJER F, HERBST BM, DU PREEZ JA. Left ventricular segmentation from MRI datasets with edge modelling conditional random fields. *BMC Medical Imaging* 2013; **13**(24) : 1-23.

GROBLER PJP, ROUX A. Coalescence and criticality of graphs. *Discrete Mathematics* 2013; 313 : 1087-1097.

WILMS JM, SMIT GJF, DIEDERICKS GPJ.An analytical model to describe the motion of a low concentration of spherical particles within a Newtonian fluid. *Chemical Engineering Science* 2013; **102** : 76-86.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

SWANEPOEL JP, COETZER J.A robust dissimilarity representation for writerindependent signature modelling. *IET Biometrics* 2013; 2(4) : 159-168.

Verrigtinge internasionaal | Proceedings international

AHRENS C, NEALY J, PÉREZ F, VAN DER WALT S. Sparse reproducing kernels for modeling fiber crossings in diffusion weighted imaging. 2013 IEEE 10th International Symposium on Biomedical Imaging: From Nano to Macro, San Francisco, California, USA, IEEE 2013: 688-691.

DE KOCK ER, SMIT GJF, KNOETZE JH, ROUSSEAU CW. Implementation of an Internal Ballistics Model in OpenFOAM. 49th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Jose, California, USA, American Institute of Aeronautics and Astronautics, Inc. 2013: 3546-3558.

FIDDER H, BOTES A, WOUDBERG S, MCGRATH PJ. Characterization of microstructure and fatigue life of CP titanium grade 2 specimens subject to various bending processes. I th International Conference on Surface Effects and Contact Mechanics: Computational Methods and Experiments, Siena, Italy, WIT Press 2013: 25-33.

JOUBERT D, BRINK WH, HERBST BM. Pose uncertainty in occupancy grids through Monte Carlo integration. 16th International Conference on Advanced Robotics 2013, School of Engineering, University of Uruguay, Montevideo, Uruguay, ICAR 2013: 6. MARITZ MF, SMIT GJF, TERBLANCHE CJ. Reconstructing fragment positions and velocities in warhead arena tests using flash X-ray radiography and witness plates. 27th International Symposium on Ballistics. Freiburg, Germany, 2013: 954-964.

RETIEF FJG, KNOETZE JH, SMIT GJF, ROUSSEAU CW, STEENKAMP A. A comparison between the OpenFOAM® Toolbox and custom-built numerical solvers for composite solid propellant combustion modeling. 49th AIAA/ASME/ SAE/ASEE Joint Propulsion Conference, San Jose, California, USA, American Institute

of Aeronautics and Astronautics 2013: 546-557. **RETIEF FJG, KNOETZE JH, SMIT GJF, ROUSSEAU CW**. Modeling the effect of condensed-phase contributions in ammonium perchlorate based composite solid propellants. 49th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, San Jose, California, USA, American Institute of Aeronautics and Astronautics 2013: 2159-2169. **ROUSSEAU CW, STEYN SF, SULLWALD W, DE KOCK ER, SMIT GJF, KNOETZE JH**. Rapid solid rocket motor design. 49th AIAA/ASME/SAE/ ASEE Joint Propulsion Conference, San Jose, California, USA, American Institute of

Aeronautics and Astronautics, Inc. 2013: 2179-2189. **SULLWALD W, SMIT GJF, STEENKAMP A, ROUSSEAU CW**. Solid rocket motor grain burn back analysis using level set methods and Monte-Carlo volume integration. 49th AIAA/ASME/SAE/ASEE Joint Propulsion Conference. San Jose, California, USA, American Institute of Aeronautics and Astronautics, Inc. 2013: 5201-5209. **WOUDBERG S**. Investigation of the effect of compression on a soft fibrous porous medium. 7th International Conference on Computational and Experimental Methods in Multiphase and Complex Flow, La Coruña, Spain, WIT Press 2013: 351-361.

Doktoraal afgehandel | Doctoral completed

CLOETE M. Modelling of non-Newtonian fluid flow through and over porous media with the inclusion of boundary effects. PhD, 2013. 433 pp. Promotor: Smit GJF. **DREIJER J**. Cardiac MRI segmentation with conditional random fields. PhD, 2013. 23 pp. Promotor: Herbst BM. Medepromotor: Du Preez JA.

WISKUNDIGE WETENSKAPPE • MATHEMATICAL SCIENCES

Tydskrifartikels (gesubsidieer) | Journal articles (subsidised)

ANDRIANTIANA EOD, WAGNER S, WANG H. Greedy trees, subtrees and antichains. *Electronic Journal of Combinatorics* 2013; 20(3) : 28.

ANDRIANTIANA EOD, WAGNER S. Spectral moments of trees with given degree sequence. *Linear Algebra and Its Applications* 2013; **439** : 3980-4002. ANDRIANTIANA EOD. Energy, Hosoya index and Merrifield-Simmons index of

Threes with prescribed degree sequence. *Discrete Applied Mathematics* 2013; **161** :724-741. **ANH PN, VAN WYK L.** Isomorphisms between strongly triangular matrix rings. *Linear Algebra and Its Applications* 2013; **438** :4374-4381.

BLECHER A, KNOPFMACHER A, LUCA F, WAGNER S. On sums of distinct odd squares arising from a class of totally symmetric plane partitions. Bulletin Mathematique de la Societe des Sciences Mathematiques de Roumanie 2013; **56**(104) : 163-171. **BREUER F.** Newton Identities for Weierstrass Products. American Mathematical Monthly 2012; **119**(9) : 796-799.

CRISTEA LL, PRODINGER H. The visibility parameter for words and permutations. Central European Journal of Mathematics 2013; 11: 283-295. DASCALESCU S, PREDUT S, VAN WYK L. Jordan isomorphisms of generalized structural matrix rings. Linear & Multilinear Algebra 2013; 61(3): 369-376. ELSHOLTZ C, HEUBERGER C, PRODINGER H. The number of Huffman codes, compact trees, and sums of unit fractions. IEEE Transactions on Information Theory 2013; 59(2): 1065-1075.

FUCHS M, PRODINGER H. Words with a generalized restricted growth property. Indagationes Mathematicae – New Series 2013; 24 : 1024-1033. GREEN BW. Bounds on the Number of Automorphisms of Curves over Algebraically Closed Fields. Israel Journal of Mathematics 2013; 194 : 69-76.

HOWELL K-T, MAXSON CJ. Mutations of Commutative Monoids with Maximal Endomorphism Semirings. *Quaestiones Mathematicae* 2013; **36** : 477-485. KILIC E, PRODINGER H. Some Double binomial sums related to Fibonacci, Pell and generalized order-\$k\$ Fibonacci numbers. *Rocky Mountain Journal of Mathematics* 2013: **43** : 975-987.

LEHNER F, WAGNER S. Free Lamplighter Groups and a Question of Atiyah. American Journal of Mathematics 2013; 135 : 835-849.

LI Y, VAN WYK L, WEI F. Jordan Derivations and Antiderivations of Generalized Matrix Algebras. *Operators and Matrices* 2013; 7(2) : 399-415. MICHAEL FI.A Note on the Five Lemma. *Applied Categorical Structures* 2013; 21 : 441-448.

MOUTON S, MUZUNDU K. Commutatively Ordered Banach Algebras. Quaestiones Mathematicae 2013; 36 : 559-587.

MUNIYANDI RC, ZIN AM, SANDERS JW. Converting differential-equation models of biological systems to membrane computing. *Biosystems* 2013; 114:219-226.

NJAGARAH HJB, NYABADZA F. Modeling the impact of rehabilitation, amelioration and relapse on the prevalence of drug epidemics. *Journal of Biological Systems* 2013; 21(1):23.

NJAGARAH HJB, NYABADZA F. Modelling the role of drug barons on the prevalence of drug epidemics. *Mathematical Biosciences and Engineering* 2013; 10(3): 843-860.

NYABADZA F, NJAGARAH HJB, SMITH RJ. Modelling the Dynamics of Crystal Meth ('Tik') Abuse in the Presence of Drug-Supply Chains in South Africa. Bulletin of Mathematical Biology 2013; 75 : 24-48.

NYABADZA F, WINKLER DMA. A simulation age-specific tuberculosis model for the Cape Town metropole. *South African Journal of Science* 2013; **109**(9/10) : 7. OUWEHAND P. Absolute retracts and essential extensions in congruence

modular varieties. Algebra Universalis 2013; **69** : 201-211. **PRODINGER H**. An identity conjectured by Lacasse via the tree function. Electronic Journal of Combinatorics 2013; **20**(3) : 7.

WAGNER S, WANG H, ZHANG X. Distance-based graph invariants of trees and the Harary index. *Filomot* 2013; 27(1):41-50.

WAGNER S. Asymptotic Enumeration of Extensional Acyclic Digraphs. *Algorithmica* 2013; **66** : 829-847.

WAGNER S. The number of fixed points of Wilf's partition involution. *Electronic Journal of Combinatorics* 2013; **20**(4) : 13.

WILD MMW, JANSON S, WAGNER S, LAURIE DP. Coupon collecting and transversals of hypergraphs. *Discrete Mathematics and Theoretical Computer Science* 2013; **15**(2) : 259-270.

WILD MMW. Computing the Output Distribution and Selection Probabilities of a Stack Filter from the DNF of Its Positive Boolean Function. *Journal of Mathematical Imaging and Vision* 2013; **46** : 66-73.

Tydskrifartikels (ongesubsidieer) | Journal articles (non-subsidised)

EBENEZER B, HARRIS E, NYABADZA F. Forecasting Buruli ulcer Disease in Ashanti Region of Ghana Using Box-Jenkins Approach. American Journal of Mathematics and Statistics 2013; 3(3): 166-177.

KILIC E, PRODINGER H. Variants of the Filbert Matrix. *Fibonacci Quarterly* 2013; **51**: 153-162.

LOUCHARD G, PRODINGER H. The Largest Missing Value in a Composition of an Integer and some Allouche-Shallit-Type Identities. *Journal of Integer Sequences* 2013; **16**: 13.2.2.

OLIVER K, PRODINGER H. Continued fractions related to Goellnitz' little partition theorem. *Afrika Matematica* 2013; **24** : 665-670. **PRODINGER H**. The m-version of binary search trees: an average-case analysis.

ISRN Journal of Combinatorics 2013; 2013 : 1-8.

Boeke | Books

NYABADZA F, KGOSIMORE M, LUNGU EM. A Treatise of Biological Models. Nova Science Publishers, Inc, New York, USA 2013:238 pp.

Hoofstukke in boeke | Chapters in books

KALULA AS, NYABADZA F, HOVE-MUSEKWA SD. Modelling

Methamphetamine Abuse: Application of a Simple Model with Self Initiation, Behaviour Change and Rehabilitation. In *A Treatise of Biological Models*, Nova Science Publishers, Inc. New York, USA, 2013: 127-144.

MUKWEMBI S, RODRIGUES BG, NYABADZA F. Graph Theoretic Applications to Disease Models. In *A Treatise of Biological Models*, Nova Science Publishers, Inc. New York, USA, 2013: 97-125.

SSEBULIBA J, NYABADZA F, OUIFKI R. Modelling HIV-TB Co-Infection dynamics in the Presence of Immunosenescence and Treatment. In A Treatise of Biological Models, Nova Science Publishers, Inc. New York, USA, 2013: 55-74.

Doktoraal afgehandel | Doctoral completed

ANDRIANTIANA EOD. Energy and related graph invariants. PhD, 2013. 172 pp. Promotor: Wagner S.

KANJUNGURI D. Modelling the control of tsetse and African trypanosomiasis through application of insecticides on cattle in Southeastern Uganda. PhD, 2013. 127 pp. Promotor: Hargrove I.

KARUMBIDZA AC. An analogue of the André-Oort conjecture for products of Drinfeld modular surfaces. PhD, 2013. 81 pp. Promotor: Breuer F.

RAZAFINDRAKOTO AD. Neighbourhood Operators on Categories. PhD, 2013. 87 pp. Promotor: Holgate DB.

SSEBULIBA D. Mathematical Modelling of the Effectiveness of Two Training Interventions on Infectious Diseases in Uganda. PhD, 2013. 209 pp. Promotor: Ouifki R.