

Faculty of Science

DEAN'S REPORT

The Faculty of Science enjoyed considerable success in its research endeavours in a number of areas during 2011.

To meet the continuing rise in cost of internationally competitive research, staff were successful in raising approximately R141 million in research income to cover a range of projects, including salaries for soft-funded staff, postdoctoral fellows and master's and PhD bursaries. This is a particularly noteworthy achievement, given the dwindling NRF resources for the pure sciences. Of this funding, R58 million was received from the NRF and some R78 million from research contracts with industry, government, public entities and statutory bodies, and science councils; with about R28 million being raised from foreign sources. Of importance to the training of postgraduate students in our faculty, staff were able to raise R32 million for bursaries in support of honours, master's and PhD students in the faculty.

The number of PhD and postdoctoral researchers remained high, with 118 postdoctoral fellows spread among the departments, and 350 PhD students registered in the faculty. A measure of the success of our postgraduate training programmes is reflected in the number of master's and doctoral graduates produced in the Science faculty in 2011, with 48 PhDs and 122 master's degrees being awarded, 22 percent of the latter with distinction. Two students who excelled in their postgraduate studies were Fhumulani Nemulodi (Department of Physics), who was awarded the prestigious S2A3 Medal for the best master's dissertation titled *Third Order Relativistic Fluid Dynamics for Heavy-Ion Collisions*, and Dr Jasper Slingsby (Department of Botany), who received the faculty PhD medal for 2011 for his thesis, titled *Ecological Differentiation and the Evolution and Maintenance of Fynbos Diversity*. Research publication output from staff and postgraduate students remained high, with about 900 articles being published in ISI journals during 2011.

As we continue to strive for excellence and international competitiveness in the research arena, the faculty is proud of the latest additions to its current 13 NRF A-rated, 56 B-rated, 45 C-rated, 24 Y-rated, and five P-rated scientists. The latter, in particular, reflects the growing research strength of our younger academic staff. Professor Ed Rybicki of the Department of Molecular and Cell Biology



received an NRF A-rating, while three young researchers, Dr Amanda Weltman (Department of Mathematics and Applied Mathematics), and Dr David Braun and Dr Shadreck Chirikure from the Department of Archaeology, received NRF P-ratings in 2011.

At the university level, three of our more senior scientists, professors George Janelidze (Department of Mathematics and Applied Mathematics), Hans-Peter Kunzi (Department of Mathematics and Applied Mathematics), and Ed Rybicki were honoured by being elected as fellows of the University of Cape Town in

recognition of their international research standing and the impact of their research. Professor Janelidze was recognised for his work in categorical algebra, including abstract Galois theory, with applications in classical algebra, geometry and topology; Professor Kunzi for his work in analytic and categorical topology, focusing on frame theory and asymmetric topology; and Professor Rybicki for his work on the use of plants and cell cultures to make pharmaceutically-important proteins, and in elucidating the virus-host interactions of grass- and cereal-infecting geminiviruses.

At a junior level, the faculty was privileged to have the UCT College of Fellows name two of our younger staff, Dr Rob Ingle (Department of Molecular and Cell Biology) and Dr Deena Pillay (Department of Zoology), as recipients of its 2011 College of Fellows' Young Researcher Awards that recognise outstanding scholarly work by young academics. Dr Ingle's research area lies in the interactions between plants and their environment, particularly in the molecular mechanisms that help them cope with stresses imposed either by other organisms or by chemical/physical factors. Dr Pillay's research interests focus on inter-tidal and estuarine ecology, with a view to understanding the role of biological interactions in structuring marine ecosystems.

An important milestone in the faculty that was reached in 2011 was the 100th anniversary of the Bolus Herbarium (Department of Botany). A series of lectures by world-renowned botanists, two exhibitions, and a commemorative collecting trip were arranged to celebrate the event. Professor Peter Linder (University of Zurich) gave the keynote address. Another development of importance to the faculty was the establishment and URC accreditation of the H-3D Centre for Drug Discovery & Development, with Professor Kelly Chibale, Department of Chemistry, as Director, and the URC accreditation of the Scientific Computing Research Unit, with Professor Kevin Naidoo,



also of the Department of Chemistry, as Director. These add to the 12 previously established URC research units and centres in the Faculty of Science. The faculty was privileged to be awarded another SARCHI Chair, in Extra-galactic Multi-wavelength Astronomy, with Professor Claude Carignan taking up the position to bolster the rapidly expanding Department of Astronomy.

Staff of the faculty continued to garner national and international awards for their research contributions. Professor Jill Farrant of the Department of Molecular and Cell Biology became the third UCT woman scientist to win the L'Oréal-UNESCO Women in Science Award in Life Sciences (region: Africa and Arab States), announced in November 2011. Another notable achievement was that of Dr Amanda Weltman, who received the 2011/12 NSTF – BHP Billiton TW Kambule Award for “an outstanding contribution to science, engineering, technology and innovation (SETI) through research and its outputs” by an emerging researcher. The faculty was privileged to have three other deserving finalists at the award ceremony

DEPARTMENTS

Department of Archaeology

Department of Astronomy

Department of Botany

Department of Chemistry

Department of Computer
Science

Department of Environmental
and Geographical Science

Department of Geological
Sciences

Department of Mathematics
and Applied Mathematics

Department of Molecular and
Cell Biology

Department of Oceanography

Department of Physics

Department of Statistical
Sciences

Department of Zoology

in Professor Kevin Naidoo, Professor Ed Rybicki, and Dr Will Horowitz. Another notable accolade went to Professor Kelly Chibale who received the prestigious Alan Pifer Award from the University of Cape Town for socially responsive research; and Dr Jeff Murugan (Department of Mathematics and Applied Mathematics) and Dr Shadreck Chirikure who were privileged to be elected as founding members of the new South African Young Academy of Science (SAYAS).

The recent announcement and associated excitement that South Africa was awarded the lion's share of the SKA bid not only reflects positively on South African science and technology in general, but also on the major contributions to the bid made by members of the Department of Astronomy. As the project rolls out in the coming years, staff and students of the department, with two SARChI Chairs in radio astronomy, will be actively engaged in contributing to the success of the initiative. This engagement will take place in tandem with getting the precursor international MEERKAT project on line.

In mid-2011, the first UCT Pro Vice-Chancellor, Professor Mark New, was appointed to head up the African Climate and Development Initiative (ACDI). A significant number of staff from the Faculty of Science are actively involved in this exciting university-wide initiative, with Professor New holding, in addition, an academic position in the Department of Environmental and Geographical Science.

A number of new initiatives were set in place in the faculty during 2011 to further develop our research impact. A new launching grant system was put into place, to allow new (and particularly young) appointments to receive sufficient funding for a three-year period to get their research careers off to a strong and competitive start. To strengthen the competitive equity pool of applicants for future academic positions in the faculty, a number of equity PhD and postdoctoral fellowships have been created and awarded. We look forward to the productive involvement of the recipients with their departments and the faculty.

The Faculty of Science continues to value and place emphasis on high quality, high impact research, and numerous formal research groupings, units and centres, which, together with many individuals, have contributed to our overall research activity that spanned the pure to the applied sciences during 2011. The quality and research performance of the academic staff in the faculty, ably supported by a range of highly skilled and dedicated administrative and technical staff, remains something that the faculty is very proud of, and is well reflected in the wide range of exciting research activities captured in this report.

PROFESSOR ANTON LE ROEX
Dean of the Faculty of Science

DOCTORAL GRADUATIONS

A.W. ANDAYI (CHEMISTRY)

Synthesis, antimalarial evaluation, B-Hematin inhibition, and in-silico and in-vitro ADMET profiling of 4-Aminoquinoline – Hydroxypyridinone Hybrids.

Supervised by Professor K. Chibale and Professor T.J. Egan

M.A. ALTARAWNEH (GEOLOGICAL SCIENCES)

Structural setting of the Jordan Northern Highlands: An integrated study using surface and sub-surface geological data by utilising GIS technology.

Supervised by Professor A. le Roex, Professor Z. Ben-Avraham and Dr G. Viola

C.G.M. ARCHIBALD (BOTANY)

The use of contemporary and historic diatom assemblages in the derivation of reference state communities for rivers in KwaZulu-Natal, South Africa.

Supervised by Professor J. Bolton

Y. BARSHEP (ZOOLOGY)

Migration and moult strategy of the Curlew Sandpiper.

Supervised by Professor L. Underhill, Dr P. Tomkovich and Dr C. Minton

J. BRABY (ZOOLOGY)

The biology and conservation of the Damara Tern in Namibia.

Supervised by Professor L. Underhill, Dr J.P. Roux and Dr R.E. Simmons

K.S. BROWN (ARCHAEOLOGY)

The Sword in the Stone: Lithic raw material exploitation in the Middle Stone Age at Pinnacle Point Site 5–6, Southern Cape, South Africa.

Supervised by Dr D.R. Braun

A. CHASKDA (ZOOLOGY)

Determinants and consequences of territory quality in the Bar-Throated Apalis Apalis Thoracica.

Supervised by Professor P.A.R. Hockey and Dr P. Lloyd

C. COHEN (ZOOLOGY)

The phylogenetics, taxonomy and biogeography of African arid zone terrestrial birds: The bustards (Otididae), sandgrouse (Pteroclididae), coursers (Glareolidae) and stone partridge (Ptilopachus).

Supervised by Professor T. Crowe

B. CROSS (MOLECULAR AND CELL BIOLOGY)

Cloning and molecular characterisation of four alginate lyase genes from vibrio midae SY9, an enteric bacterium of the abalone haliotis midae.

Supervised by Associate Professor V.E. Coyne

D. CRUICKSHANK (CHEMISTRY)

Physicochemical studies of the inclusion of selected agrochemicals in cyclodextrins.

Supervised by Professor M. Caira and Professor S. Bourne

Y. CUI (STATISTICAL SCIENCES)

Contributions to statistical machine learning algorithm.

Supervised by Professor R. Guo

T.S. DLAZA (BOTANY)

Development in culture, ecophysiology and nutritional content of three South African Porphyra (Rhodophyta, Bangiales) species.

Supervised by Professor J. Bolton and Dr R.J. Anderson

I.N. DURBACH (STATISTICAL SCIENCES)

Simplified models for multi-criteria decision analysis under uncertainty.

Supervised by Emeritus Professor T. Stewart

C.S. EALAND (MOLECULAR AND CELL BIOLOGY)

*Identification and characterisation of the activated defence response in the commercially important agarophyte, *Gracilaria gracilis*, following exposure to disease elicitors.*

Supervised by Associate Professor V.E. Coyne

Z.G. GINBOT (MOLECULAR AND CELL BIOLOGY)

*Characterisation of two, desiccation linked, Group 1 LEA proteins from the resurrection plant *Xerophyta humilis*.*

Supervised by Professor J. Farrant and Professor N. Illing

E.G. GROSCH (GEOLOGICAL SCIENCES)

Determining the physicochemical conditions on the early Earth: Barberton scientific drilling project, South Africa.

Supervised by Associate Professor S.H. Richardson, Dr A. Fagereng, Professor H. Furnes and Professor B. Robins

E.M. GUANTAI (CHEMISTRY)

Curcumin-related hybrid compounds as potential anti-malarial agents: Design, synthesis, mechanistic investigations, biological evaluation and pharmacokinetic studies.

Supervised by Professor K. Chibale

M.B. GUSH (BOTANY)

Water-use, growth and water-use efficiency of indigenous tree species in a range of forest and woodland systems in South Africa.

Supervised by Dr E. February and Dr P. Dye

S.P. HACHIGONTA (ENVIRONMENTAL AND GEOGRAPHICAL SCIENCE)

Assessing maize water requirements in the context of climate change uncertainties over southern Africa.

Supervised by Professor B. Hewitson and Dr M. Tadross

E.B. HAGER (CHEMISTRY)

The design and synthesis of new transition metal co-ordination complexes as potential antimalarial agents.

Supervised by Professor T.J. Egan and Professor J. Moss (deceased)

T. HOFFMAN (ZOOLOGY)

*The spatial ecology of chacma baboons (*Papio ursinus*) in the Cape Peninsula, South Africa: Towards improved management and conservation strategies.*

Supervised by Associate Professor J. O'Riain

M.G.W. JONES (ZOOLOGY)

Individual variation in reproductive success in the wandering albatross.

Supervised by Associate Professor P.G. Ryan

S.W. KIMANI (MOLECULAR AND CELL BIOLOGY)

*Catalysis, substrate binding and specificity in the amidase from *Nesterenkonia* species.*

Supervised by Professor B.T. Sewell

T. LAMONT (OCEANOGRAPHY)

Bio-optical investigation of phytoplankton production in the Southern Benguela ecosystem.

Supervised by Professor C. Reason and Dr R. Barlow

I.T. LITTLE (ZOOLOGY)

Bird reproductive success as a tool for understanding the impacts of land-use management on moist highland grassland biodiversity in South Africa.

Supervised by Professor P.A.R. Hockey

S.K. MAFWILA (ZOOLOGY)

Ecosystem effects of bottom trawling in the Benguela current system: Experimental and retrospective data analyses.

Supervised by Professor J.G. Field, Dr L. Shannon and Associate Professor A. Jarre

A. MAUNDER (COMPUTER SCIENCE)

Designing appropriate interactive systems for the developing world.

Supervised by Associate Professor G. Marsden

G.K. MAZANDU (MOLECULAR AND CELL BIOLOGY)

*Data integration for the analysis of uncharacterised proteins in *Mycobacterium tuberculosis*.*

Supervised by Associate Professor N. Mulder

A. MEAD (ZOOLOGY)

Climate and bioinvasives: Drivers of change on South African rocky shores?

Supervised by Professor C. Griffiths

F.J. MHLANGA (MATHEMATICS AND APPLIED MATHEMATICS)

Computation of Greeks using Malliavin calculus.

Supervised by Professor R.I. Becker and Dr D. Wilcox

M.F. MUNYOLOLO (CHEMISTRY)

New synthetic routes to functionalised 2-C-alkylglucosides, precursors of potential inhibitors of mycothiol biosynthesis in the Mycobacteria.

Supervised by Associate Professor D.W. Gammon

G. OATLEY (ZOOLOGY)

Taxonomy, phylogeny and eco-biogeography of Southern African white-eyes (Zosterops spp.) Aves: Order Passeriformes Family: Zosteropidae.

Supervised by Associate Professor J.H. Hoffmann

A.M.O. RIBEIRO (ZOOLOGY)

Ecological and evolutionary processes in two Southern African endemic birds.

Supervised by Professor P.A.R. Hockey

M. ROUAULT (OCEANOGRAPHY)

Agulhas Current variability determined from space: A multi-sensor approach.

Supervised by Professor F. Shillington

H. SAMSODIEN (CHEMISTRY)

Supramolecular derivatives of selected bioactive compounds: A physicochemical study.

Supervised by Professor M. Caira and Professor S. Bourne

D. SHUULUKA (BOTANY)

Ecophysiological studies of three South African Ulva species from integrated seaweed/abalone aquaculture and natural populations.

Supervised by Professor J. Bolton and Professor R. Anderson

R. SITHALDEEN (ARCHAEOLOGY)

Phylogeny and phylogeography of the Chacma Baboon (Papio ursinus): The role of landscape in shaping contemporary genetic structure in the Southern African baboon.

Supervised by Associate Professor R. Ackermann and Dr J. Bishop

J.A. SLINGSBY (BOTANY)

Ecological differentiation and the evolution and maintenance of Fynbos diversity.

Supervised by Dr T. Verboom and Professor M. Cramer

M. SPARK (ASTRONOMY)

Exploring the application of new telescope technologies in the testing of dwarf novae accretion models.

Supervised by Associate Professor P.A. Woudt

A. TEKOLA (ASTRONOMY)

On evolution of star forming galaxies: the metallicity of dwarfs and the effect of environment on local luminous IR galaxies.

Supervised by Associate Professor P.A. Woudt, Dr P. Vaisanen and Dr A. Kniazev

R.E. THARME (ZOOLOGY)

Ecologically relevant low flows for riverine benthic macroinvertebrates: characterisation and application.

Supervised by Associate Professor J. Day and Professor J.M. King

F. TUMMON (ENVIRONMENTAL AND GEOGRAPHICAL SCIENCE)

Direct and semi-direct aerosol effects on the Southern African regional climate during the austral winter season.

Supervised by Dr M. Tadross, Professor B. Hewitson and Professor F. Solomon

I.W. TUNBRIDGE (COMPUTER SCIENCE)

Graphics Processing Unit Accelerated Coarse-Grained Protein-protein docking.

Supervised by Dr M. Kuttel and Dr J. Gain

R. TUYIRAGIZE (STATISTICAL SCIENCES)

Multi-objective optimisation techniques in electricity generation planning.

Supervised by Emeritus Professor T. Stewart

K.L. VAN NIEKERK (ARCHAEOLOGY)

Marine fish exploitation during the Middle and Later Stone Age of South Africa.

Supervised by Professor J. Sealy

R.J.T. VERWEIJ (BOTANY)

Niche differentiation in savannas: exploring competition-based hypotheses for inter-life form co-existence.

Supervised by Dr E. February and Professor W. Bond

L.J. WALLER (ZOOLOGY)

The African Penguin (Spheniscus demersus): Conservation and management issues.

Supervised by Professor L. Underhill

J.D. WOODWARD (MOLECULAR AND CELL BIOLOGY)

The relationship between structure and specificity in the plant nitrilases.

Supervised by Associate Professor T. Sewell

PATENTS

FILED APPLICATIONS

BRITTON, D.T. AND HÄRTING, M.

Assembling and packaging a discrete electronic component. PCT Patent Application PCT PCT/IB2011/053999.

BRITTON, D.T. AND HÄRTING, M.

Printed temperature sensor. PCT Patent Application PCT PCT/IB2011/054001.

BRITTON, D.T. AND HÄRTING, M.

Producing stable oxygen terminated semi conducting nanoparticles. National Phase Patent Application Russia 2011 137 638.

BRITTON, D.T., HÄRTING, M. AND ODO, A.E.

Inkjet printing of nanoparticulate functional inks. National Phase Patent Application Russia RUxIB2009/052317.

BRITTON, D.T. AND SCRIBA, M.R.

Method of producing nanoparticles. Provisional Patent Application South Africa 2011/05035.

CAIRA, M.R., DE VILLIERS, M.M., LIEBENBERG, W. AND STIENGER, N.

An injectable formulation. PCT Patent Application PCT PCT/IB2011/052386.

CHIRIRIWA, H., HENDRICKS, D.T. AND MOSS, J.R.

Organometallic compounds. PCT Patent Application PCT PCT/IB2011/001441.

DE WIT, M.J. AND GILDER, S.A.

The genesis of a diamond. National Phase Patent Application South Africa 2011/09252.

EGAN, T.J., HUNTER, R. AND ZISHIRI, V.K.

Quinoline antimalarial containing a chloroquine resistance reversing dibemethin group. National Phase Patent Application South Africa ZAxPCTIB09/053578.

EGAN, T.J., HUNTER, R. AND ZISHIRI, V.K.

Quinoline compounds containing a dibemethin group. National Phase Patent Application ARIPO AP/P/2011/005602.

HITZEROTH, I.I., MACLEAN, J.M., RYBICKI, E.P. AND WILLIAMSON, A-L.

Expression of proteins in plants. Divisional Patent Application Europe 11162685.9.

HITZEROTH, I.I. AND RYBICKI, E.P.

HPV chimaeric particle. Provisional Patent Application South Africa 2011/08841.

HUNTER, R., KASCHULA, C.H. AND PARKER, M.I.

Compounds useful for the inhibition of the growth of tumour cells. National Phase Patent Application South Africa 2011/01690.

HUNTER, R., KASCHULA, C.H. AND PARKER, M.I.

Organosulfur compounds, a method of making organosulfur compounds and their use for inhibiting the growth of tumour cells. National Phase Patent Application China 200980139471.8.

HUNTER, R., KASCHULA, C.H. AND PARKER, M.I.

Organosulfur compounds, a method of making organosulfur compounds and their use for inhibiting the growth of tumour cells. National Phase Patent Application India 739/DELNP/2011.

HUNTER, R., KASCHULA, C.H. AND PARKER, M.I.

Organosulfur compounds, a method of making organosulfur compounds and their use for inhibiting the growth of tumour cells. National Phase Patent Application United States 13/057,960.

ILLING, N., STEIN, D.J. AND VAN HEERDEN, J.H.

A method of diagnosing a mental state. National Phase Patent Application South Africa ZAxPCT/IB10/050768.

ILLING, N., STEIN, D.J. AND VAN HEERDEN, J.H.

A method of diagnosing a mental state. National Phase Patent Application United States USxPCT/IB10/050768.

JAYAKODY, R.S. AND NAIDOO, K.J.

Inhibitors of type II ribosome inactivating proteins. Provisional Patent Application South Africa 2011/06840.

LE, H.

Medium access control in wireless sensor networks. PCT Patent Application PCT PCT/IB2011/000208.

REID, S.J.

Ostrich feed supplement. National Phase Patent Application Australia 2011218616.

REID, S.J.

Ostrich feed supplement. National Phase Patent Application Brazil BRxZA2010/6209.

REID, S.J.

Ostrich feed supplement. National Phase Patent Application South Africa 2011/06400.

GRANTED

ANDERSON, K. AND HUNTER, R.

Potent chimaeric NRTI-NNRTI bifunctional inhibitors of HIV-1 reverse transcriptase. National Phase Patent South Africa 2010/7066.

BRITTON, D.T. AND HÄRTING, M.

A thin film semi conductor device and method of manufacturing a thin film semi conductor device. National Phase Patent United States 8, 026, 565.

BRITTON, D.T. AND HÄRTING, M.

Doping of particulate semi conductor materials. National Phase Patent Europe EP 1 926 843.

CHIBALE, K., NCHINDA, A.T. AND STURROCK, E.D.

Angiotensin I-converting enzyme (ACE) inhibitors. National Phase Patent Australia 2006250905.

CHIBALE, K., NCHINDA, A.T. AND STURROCK, E.D.

Angiotensin I-converting enzyme (ACE) inhibitors. National Phase Patent Australia 2006250906.

CHIBALE, K., NCHINDA, A.T. AND STURROCK, E.D.

Angiotensin I-converting enzyme (ACE) inhibitors. National Phase Patent United States 7,981,922.

RESEARCH CONTRACTS

260

VALUE OF RESEARCH CONTRACTS

R78 million

NRF-RATED RESEARCHERS

143

SARCHI RESEARCH CHAIRS

7

ACCREDITED RESEARCH GROUPINGS

14

DOCTORAL GRADUATIONS

48

ERP PARTICIPANTS

77

DHET-ACCREDITED JOURNALS

301.34 units

PEER-REVIEWED PUBLICATIONS

889

FILED PATENTS

23

GRANTED PATENTS

6

POSTGRADUATE STUDENTS

959

POSTGRADUATE FUNDING

R43,18 million

POSTDOCTORAL RESEARCH FELLOWS

118

POSTDOCTORAL RESEARCH FUNDING

R 19,33 million

HEAD OF DEPARTMENT: PROFESSOR JUDITH SEALY

DEPARTMENTAL PROFILE

The Department of Archaeology is characterised by a diversity of well-established research interests. The Western Cape has a rich archaeological heritage which includes evidence of hunter-gatherer settlement, pastoralist communities and colonial settlers - all the subject of ongoing research. Further afield, the Department also has a research focus on the archaeology of early Tswana and Sotho-speaking agropastoralists, particularly in North West and the Free State. In addition, the Department is home to archaeometric and materials research, focussing on palaeoanthropology, past environments, early human diets and materials analysis. The Department of Archaeology has developed an expertise in Cultural Resource Management, working with both government and private sectors to mitigate the effects of development and widen public awareness of the importance of the past.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professor	1
Associate Professor	1
Senior Lecturers	3
Lecturers	2
Research Staff	5
Technical Support Staff	2
Administrative and Clerical Staff	1
Departmental Assistant	1
Lab Assistant	1
Total	17

Honorary staff

Honorary Research Associates	6
Total	6

Students

Postdoctoral	0
Doctoral	10
Master's	13
Honours	4
Undergraduates	618
Total	667

DEPARTMENT OF ARCHAEOLOGY RESEARCH FIELDS AND STAFF

Permanent staff

PROFESSOR JUDITH SEALY

Head of Department. Archaeometry, stable isotopes, precolonial southern Africa

ASSOCIATE PROFESSOR REBECCA ROGERS ACKERMANN

Hominid evolution, variation, morphometrics, visualization and modelling, quantitative methods

DR DAVID BRAUN

Senior lecturer, Early Stone Age in eastern and southern Africa, stone artefact technology

DR SHADRECK CHIRIKURE

Senior lecturer, Archaeometallurgy, Iron Age, heritage studies

DR SIMON HALL

Senior lecturer, hunter-gatherers and farmers, Stone/Iron Age interaction, landscape sharing

MS RIASHNA SITHALDEEN

Lecturer, Primate biogeography using genetic techniques, academic development in the geosciences

DR DEANO STYNDER

Lecturer, Africa fauna, faunal analysis, ecomorphology, palaeoenvironments

Contract research staff

MR DAVID HALKETT

Contract archaeology, historical archaeology, prehistory of the southwestern Cape

MR TIM HART

Contract archaeology, historical archaeology, prehistory of the southwestern Cape

MR JAYSON ORTON

Contract archaeology, historical archaeology, prehistory of the southwestern Cape

DR LITA WEBLEY

Contract archaeology, historical archaeology, prehistory of the southwestern Cape

MS LIESBET SCHIETECATTE

Contract archaeology, historical archaeology, prehistory of the southwestern Cape

Emeritus Professors

PROFESSOR NIKOLAAS J. VAN DER MERWE

Isotopes; palaeodiets, palaeoenvironments, archaeometallurgy

PROFESSOR JOHN PARKINGTON

Hunter-gatherers, palaeoenvironmental reconstruction and human ecology, prehistoric art, coastal archaeology

Emeritus Associate Professor

ASSOCIATE PROFESSOR A. SMITH

Prehistoric pastoralism, origins of food production, ethnohistory

Honorary Research Associates

DR G. AVERY

Archaeozoology

DR PER DITLEF FREDRIKSEN

Ceramics, ethnoarchaeology, archaeology of farming communities

MR P. JOLLY

Contact period Rock art, history of San-Nguni/Sotho interaction

PROFESSOR T. MAGGS

Iron Age archaeology in southern Africa

DR W. NDORO

Heritage Studies

PROFESSOR S. PFEIFFER

Biological anthropology

Distinguished visitors

PROFESSOR JACK FISHER

Montana State University – faunal remains in archaeology

DR ALEX MACKAY

Australian National University – Pleistocene lithic technology

PROFESSOR SUSAN PFEIFFER

University of Toronto – biological anthropology

PROFESSOR SILVIA TOMÁŠKOVÁ

University of North Carolina – rock art, archaeological theory

PROFESSOR PIERRE-JEAN TEXIER

CNRS-Valbonne France – prehistory

PROFESSOR MARGOT WINER

Historical archaeology, landscape archaeology

CONTACT DETAILS

Postal address: Department of Archaeology, University of Cape Town, Private Bag X3, Rondebosch, 7701

Telephone: +27 21 650 2353

Fax: +27 21 650 2352

E-mail: lynn.cable@uct.ac.za

Web: <http://www.uct.ac.za/depts/age/>

RESEARCH OUTPUT

Authored books

Chirikure, S., Delius, P., Esterhuysen, A., Hay, M., Manyanga, M., Mulaudzi, M., Schoeman, A. and Smith, J. 2011. *Mapungubwe a Living Legacy*. Johannesburg: Mapungubwe Institute for Strategic Reflection (MISTRA). 30pp. ISBN 978-0-9869999-0-1.

Chapters in books

Sealy, J.C. and Galimberti, M. 2011. Shellfishing and the interpretation of shellfish sizes in the Middle and Later Stone Ages of South Africa. In N.F. Bicho, J.A. Haws and L.G. Davis (eds), *Trekking the Shore*, pp. 405-419. New York: Springer. ISBN 978-1-4419-8218-6.

Stewart, B., Parkington, J.E. and Fisher, J. 2011. The tortoise and the ostrich egg: projecting the home base hypothesis into the 21st century. In J. Sept and D. Pilbeam (eds), *Casting the Net Wide: Papers in Honour of Glynn Isaac and His Approach to Human Origins Research*, pp. 255-278. Oxford: Oxbow Books. ISBN 978-1-84217-454-8.

Articles in Peer-reviewed Journals

Avery, G. and Klein, R. 2011. Review of fossil phocid and otariid seals from the southern and western coasts of South Africa. *Transactions of the Royal Society of South Africa*, 66(1): 14-24.

Avery, M. and Avery, G. 2011. Micromammals in the Northern Cape Province of South Africa, past and present. *African Natural History*, 7: 9-39.

Chemere, Y.S. and Negash, A. 2011. An Ethnoarchaeology of lithic site-formation patterns amongst the Hadiya of Ethiopia: Some initial Results. *Nyame Akuma*, 74: 36-41.

Codron, J., Codron, D.C., Lee-Thorp, J., Sponheimer, M., Kirkman, K., Duffy, K. and Sealy, J.C. 2011. Landscape-scale feeding patterns of African elephant inferred from carbon isotope analysis of feces. *Oecologia*, 165: 89-99.

Copeland, S.R., Sponheimer, M., de Ruiter, D., Lee-Thorp, J.A., Codron, D.C., Le Roux, P., Grimes, V. and Richards, M.P. 2011. Strontium Isotope evidence for landscape use by early hominins. *Nature*, 474: 76-78.

- Finnegan, E., Hart, T.J.G. and Halkett, D. 2011. The 'informal' burial ground at Prestwich Street, Cape Town: Cultural and chronological indicators for the historical cape underclass. *South African Archaeological Bulletin*, 66(194): 136-148.
- Gonzalez-Ruibal, A., Chemere, Y.S. and Vila, X. 2011. A social archaeology of colonial war in Ethiopia. *World Archaeology*, 43(1): 40-65.
- Govender, R., Avery, G. and Chinsamy-Turan, A. 2011. Pathologies in the Early Pliocene phocid seals from Langebaanweg, South Africa. *South African Journal of Science*, 107(1/2): 1-6.
- Maggs, T. and Ward, V. 2011. Judith Mkhabela, an inspirational potter from KwaZulu-Natal. *Southern African Humanities*, 23: 151-171.
- Malan, A. and Worden, N.A. 2011. Constructing and contesting histories of slavery at the Cape, South Africa. *Proceedings of the British Academy*, 168: 393-419.
- Matthews, T. and Stynder, D. 2011. An analysis of the *Aethomys* (Murinae) community from Langebaanweg (Early Pliocene, South Africa) using geometric morphometrics. *Palaeogeography Palaeoclimatology Palaeoecology*, 302: 230-242.
- Matthews, T. and Stynder, D. 2011. An analysis of two *Myosorex* species (Soricidae) from the Early Pliocene site of Langebaanweg (West Coast, South Africa) using geometric morphometrics, linear measurements, and non-metric characters. *Geobios*, 44: 87-99.
- Ndiema, E., Dillian, C.D., Braun, D.R., Harris, J. and Kiura, P. 2011. Transport and subsistence patterns at the transition to pastoralism, Koobi Fora, Kenya. *Archaeometry*, 53(6): 1085-1098.
- Orton, J., Klein, R., Mackay, A., Schwartz, S. and Steele, T. 2011. Two Holocene rock shelter deposits from the Knersvlakte, southern Namaqualand, South Africa. *Southern African Humanities*, 23: 109-150.
- Pfeiffer, S. 2011. Pelvic stress injuries in a small-bodied forager. *International Journal of Osteoarchaeology*, 21: 694-703.
- Pikirayi, I. and Chirikure, S. 2011. Debating Great Zimbabwe. *Azania-Archaeological Research in Africa*, 46(2): 221-231.
- Sithaldeen, R., Bishop, J. and Ackermann, R. 2011. The role of landscape in shaping contemporary genetic structure in the chacma baboon (*Papio ursinus*). *American Journal of Physical Anthropology*, 144: 275-275.
- Stynder, D. 2011. Fossil bovid diets indicate a scarcity of grass in the Langebaanweg E Quarry (South Africa) late Miocene/early Pliocene environment. *Paleobiology*, 37(1): 126-139.
- Tseng, Z. and Stynder, D.D. 2011. Mosaic functionality in a transitional ecomorphology: skull biomechanics in stem Hyaeninae compared to modern South African carnivorans. *Biological Journal of the Linnean Society*, 102: 540-559.
- Van Der Merwe, N.J. 2011. Male philopatry and female dispersal amongst two species of early hominins from the Sterkfontein Valley. *South African Journal of Science*, 107(7/8): 1-2.

Peer-reviewed published conference proceedings

Avery, G. 2011. Holocene avian remains, human behaviour and seasonality on the South Africa coast. In H. Jousse and J. Lesur (eds), *Reports in African Archeology: People and Animals in Holocene Africa, 23-28 August 2010, Paris (France)*. Frankfurt: Africa Magna Verlag, Germany. ISBN 978-3-937248-27-1.

Avery, G. 2011. People and animals in Holocene Africa: recent advances in archaeozoology. In H. Jousse and J. Lesur (eds), *Reports in African Archeology: People and Animals in Holocene Africa, 23-28 August 2010, Paris (France)*. Frankfurt: Africa Magna Verlag, Germany. ISBN 978-3-937248-27-1.

DEPARTMENT OF ASTRONOMY

(Including the Astrophysics, Cosmology and Gravitation Centre)

ACTING HEAD OF DEPARTMENT: ASSOCIATE PROFESSOR PATRICK WOUTD

HEAD OF DEPARTMENT: PROFESSOR RENÉE C. KRAAN-KORTEWEG ON SABBATICAL FOR 2011

DEPARTMENTAL PROFILE

The Department of Astronomy has welcomed three new staff members in 2011.

Professor Claude Carignan has joined the Department as the South African SKA-SARChI Chair in Multi-wavelength Astronomy and Professor Rob Fender as part-time visiting SKA Professor. Dr Vanessa McBride has taken up the UCT/SAAO joint Lecturer position previously held by Dr Thebe Medupe. Our postdoctoral cohort has grown from two at the beginning of 2011 to eight at year end.

The Department specialises in the study of the distance scale, large-scale structure and evolution of galaxies in the Universe, next to high-speed photometry and spectroscopy of variable stars.

Particular emphasis is being given on uncovering galaxies obscured by the Milky Way and the mapping of cosmic flow fields such as in the Great Attractor region. With the start of scientific observations with SALT, the Southern African Large Telescope, new research areas have been initiated in galaxy evolution (as a function of environment and redshift), the dark matter content in nearby dwarf and low surface brightness galaxies and the search for intermediate mass black holes.

In the light of the coming of MeerKAT – the large radio telescope that is being built in the Karoo – the department has developed expertise in radio astronomy. In particular, neutral hydrogen studies are used to examine the dynamics – and thereby the dark matter content - of nearby galaxies. Members of the Astronomy department are currently leading four MeerKAT large survey projects of the transient radio sky (ThunderKAT) as well as deep HI (Laduma and Mhongoose) and continuum (Mightee) surveys.

Studies of cataclysmic variable stars (exploding stars such as novae) and pulsating white dwarf stars remain a highly active research area of the department, in which the high speed photometric capabilities of SALT also offer new unique mechanisms to learn more about the physics of these highly interesting objects.

The Department forms part of the Research Centre for Astrophysics, Cosmology and Gravitation at UCT (<http://www.acgc.uct.ac.za>), established in 2009.

The Department is an active participant of the National Astrophysics and Space Science Programme – hosted at UCT – which offers Honours and Master's degrees. It has strong links with the South African Astronomical Observatory (SAAO) and the South African SKA project through joint staffing positions and postgraduate student supervision. The Department also enjoys active research collaborations with other groups abroad.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professors	3.5
Associate Professor	1
Senior Scholar/Emeritus Professor	1
Senior Lecturer	1
Lecturer	1.5
Visiting SKA Professor	0.1
Administrative Staff	3
Total	11.1

Honorary & Emeritus Staff

Honorary Professor	1
Research Associate	1
Total	2

Affiliated Researchers

Honorary Professor	1
Honorary Academic	1
Total	2

Postdoctoral Fellows	8
Total	8

Students

Doctoral	12
Master's (Research)	3
Master's (NASSP Dissertation)	14
Master's (NASSP Coursework)	19
Honours (NASSP)	19
Undergraduate	179
Total	246

RESEARCH FIELDS AND STAFF

Permanent Staff

PROFESSOR RENÉE C. KRAAN-KORTEWEG (HEAD OF DEPARTMENT), CO-DIRECTOR ACGC

Large-scale structures and streaming motions in the nearby Universe, Zone of Avoidance, systematic HI-surveys; Tully-Fisher relation; clusters of galaxies.

PROFESSOR ERWIN DE BLOK (DST/NRF SARCHI CHAIR)

Dark matter in disk galaxies, low surface brightness galaxies. HI surveys, the interstellar medium in nearby galaxies, evolution of dark galaxies.

PROFESSOR CLAUDE CARIGNAN (SKA SARCHI CHAIR)

Galaxy dynamics and dark matter; astronomical instrumentation and techniques.

PROFESSOR PATRICIA WHITELOCK (JOINT SAAO/UCT POSITION)

Galactic structure, stellar evolution, Local Group galaxies, long period variable and symbiotic stars.

EMERITUS DISTINGUISHED PROFESSOR BRIAN WARNER (SENIOR SCHOLAR)

Cataclysmic variable stars; white dwarf stars; history of astronomy.

ASSOCIATE PROFESSOR PATRICK A. WOUTD (ACTING HEAD OF DEPARTMENT FOR 2011)

Cataclysmic variable stars, ultra-compact binaries, high time domain astrophysics.

DR KURT VAN DER HEYDEN (SENIOR LECTURER)

Supernovae and Supernova remnants, systematic HI surveys, clusters of galaxies, X-ray spectroscopy.

DR SARAH BLYTH (LECTURER)

Large-scale structure, galaxy evolution and galaxy clusters.

DR VANESSA MCBRIDE (LECTURER, JOINT SAAO/UCT POSITION)

X-ray binaries, Magellanic Clouds.

PROFESSOR ROB FENDER (VISITING SKA PROFESSOR)

X-ray binaries, neutron stars, black holes, accretion disks, radio transient surveys.

Honorary Staff in the Department

HONORARY PROFESSOR MICHAEL W. FEAST

Honorary Research Associate. Stellar evolution; Galactic structure; long period variable stars; distance scales.

DR IAN STEWART

Honorary Research Associate. Signal direction in Poisson noise; algorithms for calibration and analysis of radio interferometer data; sympatric speciation.

HONORARY STAFF ASSOCIATED WITH THE DEPARTMENT

HONORARY PROFESSOR PHIL A. CHARLES (SAAO)

Cataclysmic variables; X-ray binaries, neutron stars, black holes, accretion disks.

PROFESSOR PETER DUNSBY

Honorary Academic, Director NASSP, Co-director ACGC. Theoretical cosmology and gravity.

Postdoctoral Fellows

DR GARRY ANGUS

Cosmological simulations with modified Newtonian Dynamics.

DR RICHARD ARMSTRONG

Radio transients, radio interferometric techniques.

DR KELLEY HESS

Neutral hydrogen in nearby galaxies, galaxy groups and clusters.

DR DANIELLE LUCERO

Cold gas and star formation in early-type galaxies.

DR NATASHA MADDOX

Quasars and multi-wavelength observations of galaxies.

DR DAVID PUGLIELLI

Galaxy dynamics.

DR VALERIO RIBEIRO

Cataclysmic variables, novae; radio transients.

DR MATTHEW SCHURCH

Cataclysmic variables and X-ray binaries.

CONTACT DETAILS

Postal Address: Department of Astronomy, University of Cape Town, Private Bag X3, Rondebosch, 7701

Telephone: +27 (21) 650 5830

Fax: 27 (21) 650 4547

E-mail: admin@ast.uct.ac.za

Webpage: <http://www.ast.uct.ac.za>

RESEARCH OUTPUT

Articles in Peer-reviewed Journals

Angus, G. and Diaferio, A. 2011. The abundance of galaxy clusters in modified Newtonian dynamics: cosmological simulations with massive neutrinos. *Monthly Notices of the Royal Astronomical Society*, 417: 941-949.

Angus, G., Diaferio, A. and Kroupa, P. 2011. Using dwarf satellite proper motions to determine their origin. *Monthly Notices of the Royal Astronomical Society*, 416: 1401-1409.

Bagetakos, I., Brinks, E., Walter, F., De Blok, W.J.G., Usero, A., Leroy, A., Richards, J. and Kennicutt, R.C. 2011. The fine-scale structure of the neutral interstellar medium in Nearby Galaxies. *Astronomical Journal*, 141(23): 1-35

Benedict, G.F., McArthur, B.E., Feast, M.W., Barnes, T.G., Harrison, T.E., Bean, J.L., Menzies, J.W., Chaboyer, B., Fossati, L., Nesvacil, N., Smith, H.A., Kolenberg, K., Laney, C.D., Kochukhov, O., Nelan, E.P., Shulyak, D.V., Taylor, D. and Freedman, W.L. 2011. Distance scale zero points from galactic RR Lyrae star parallaxes. *Astronomical Journal*, 142:187. 21pp.

Bigiel, F., Leroy, A.K., Walter, F., Brinks, E., De Blok, W.J.G., Kramer, C., Rix, H.-W., Schrubba, A., Schuster, K., Usero, A. and Wiesemeyer, H.W. 2011. A constant molecular gas depletion time in nearby disk galaxies. *Astrophysical Journal Letters*, 730:L13. 6pp.

Chemin, L., De Blok, W.J.G. and Mamon, G. 2011. Improved modeling of the mass distribution of Disk Galaxies by the Einasto Halo Model. *Astronomical Journal*, 142:109. 15pp.

Comeron, S., Knapen, J.H., Sheth, K., Regan, M.W., Hinz, J.L., de Paz, A.G., Menendez-Delmestre, K., Munoz-Mateos, J.-C., Seibert, M., Kim, T., Athanassoula, E., Bosma, A., Buta, R.J., Elmegreen, B.G., Ho, L.C., Holwerda, B., Laurikainen, E., Salo, H. and Schinnerer, E. 2011. The thick disk in the galaxy NGC 4244 from S4G imaging. *Astrophysical Journal*, 729:18. 12pp.

Comeron, S., Elmegreen, B.G., Knapen, J.H., Salo, H., Laurikainen, E., Laine, J., Athanassoula, E., Bosma, A., Sheth, K., Regan, M.W., Hinz, J.L., de Paz, A.G., Menendez-Delmestre, K., Mizusawa, T., Munoz-Mateos, J.-C., Seibert, M., Kim, T., Elmegreen, D.M., Gadotti, D.A., Ho, L.C., Holwerda, B., Lappalainen, J., Schinnerer, E. and Skibba, R. 2011. Thick disks of edge-on galaxies seen through the Spitzer survey of stellar structure in galaxies (S4G): Lair of Missing Baryons? *Astrophysical Journal*, 741:28. 21pp.

Copperwheat, C.M., Marsh, T.R., Dhillon, V.S., Littlefair, S.P., Woudt, P.A., Warner, B., Patterson, J., Steeghs, D., Kemp, J., Armstrong, E. and Rea, R. 2011. The photometric period in ES Ceti. *Monthly Notices of the Royal Astronomical Society*, 413: 3068-3074.

Elson, E., De Blok, W.J.G. and Kraan-Korteweg, R.C. 2011. A search for non-circular flows in the extended HI disc of NGC 2915. *Monthly Notices of the Royal Astronomical Society*, 411: 200-211.

Elson, E., De Blok, W.J.G. and Kraan-Korteweg, R.C. 2011. Three-dimensional modelling of the HI kinematics of NGC 2915. *Monthly Notices of the Royal Astronomical Society*, 415: 323-332.

Font, J., Beckman, J.E., Rosado, M., Epinat, B., Fathi, K., Hernandez, O., Carignan, C., Gutierrez, L., Relano, M., Blasco-Herrera, J. and Fuentes-Carrera, I. 2011. Detection of infalling hydrogen in transfer between the interacting galaxies NGC 5426 and NGC 5427. *Astrophysical Journal Letters*, 740:L1. 5pp.

Gentile, G., Famaey, B. and De Blok, W.J.G. 2011. THINGS about MOND. *Astronomy & Astrophysics*, 527: A76. 11pp.

Holwerda, B., Pirzkal, N., Bouchard, A., De Blok, W.J.G., Blyth, S., Van Der Heyden, K. and Elson, E. 2011. Quantified HI morphology - I. Multi-wavelength analysis of the THINGS galaxies. *Monthly Notices of the Royal Astronomical Society*, 416: 2401-2414.

Holwerda, B., Pirzkal, N., De Blok, W.J.G., Bouchard, A., Blyth, S.L., Van Der Heyden, K. and Elson, E. 2011. Quantified HI morphology - II. Lopsidedness and interaction in WHISP column density maps. *Monthly Notices of the Royal Astronomical Society*, 416: 2415-2425.

Holwerda, B., Pirzkal, N., Cox, T.J., De Blok, W.J.G., Weniger, J., Bouchard, A., Blyth, S.L. and Van Der Heyden, K. 2011. Quantified HI Morphology - III. Merger visibility times from HI in galaxy simulations. *Monthly Notices of the Royal Astronomical Society*, 416: 2426-2436.

Holwerda, B., Pirzkal, N., De Blok, W.J.G., Bouchard, A., Blyth, S.L. and Van Der Heyden, K. 2011. Quantified HI morphology - IV. The merger fraction and rate in WHISP. *Monthly Notices of the Royal Astronomical Society*, 416: 2437-2446.

Holwerda, B., Pirzkal, N., De Blok, W.J.G. and van Driel, W. 2011. Quantified HI morphology - V. HI discs in the Virgo cluster. *Monthly Notices of the Royal Astronomical Society*, 416: 2447-2454.

Jurua, E., Charles, P., Still, M. and Meintjes, P.J. 2011. The optical and X-ray light curves of Hercules X-1. *Monthly*

- Notices of the Royal Astronomical Society, 418: 437-443.
- Maccarone, T.J. and Warner, B. 2011. Strong [OIII] and [NII] emission lines in globular clusters from photoionized R Corona borealis star winds. *Monthly Notices of the Royal Astronomical Society*, 410: L32-L36.
- Matsunaga, N., Feast, M.W. and Soszynski, I. 2011. Period-luminosity relations of type II Cepheids in the Magellanic Clouds. *Monthly Notices of the Royal Astronomical Society*, 413: 223-234.
- Matsunaga, N., Kawadu, T., Nishiyama, S., Nagayama, T., Kobayashi, N., Tamura, M., Bono, G., Feast, M.W. and Nagata, T. 2011. Three classical Cepheid variable stars in the nuclear bulge of the Milky Way. *Nature*, 477: 188-190.
- Menzies, J.W., Feast, M.W., Whitelock, P. and Matsunaga, N. 2011. Asymptotic giant branch stars in the Sculptor dwarf spheroidal galaxy. *Monthly Notices of the Royal Astronomical Society*, 414: 3492-3500.
- Mereghetti, S., La Palombara, N., Tiengo, A., Pizzolato, F., Esposito, P., Woudt, P.A., Israel, G. and Stella, L. 2011. X-Ray and Optical Observations of the Unique Binary System HD 49798/RX J0648.0-4418. *Astrophysical Journal*, 737:51. 8pp.
- Newling, J., Varughese, M., Bassett, B.A., Campbell, H., Hlozek, R., Kunz, M., Lampeitl, H., Martin, B., Nichol, R., Parkinson, D. and Smith, M. 2011. Statistical classification techniques for photometric supernova typing. *Monthly Notices of the Royal Astronomical Society*, 414: 105-112.
- Oh, S.H., De Blok, W.J.G., Brinks, E., Walter, F. and Kennicutt, R.C. 2011. Dark and luminous matter in THINGS dwarf galaxies. *Astronomical Journal*, 141:193. 45 pp.
- Oh, S.H., Brook, C., Governato, F., Brinks, E., Mayer, L., De Blok, W.J.G., Brooks, A. and Walter, F. 2011. The central slope of dark matter cores in dwarf galaxies: simulation versus THINGS. *Astronomical Journal*, 142:24. 12pp.
- Potter, S., Romero-Colmenero, E., Ramsay, G., Crawford, S.M., Gulbis, A., Barway, S., Zietsman, E., Kotze, M., Buckley, D.A.H., O'Donoghue, D., Siegmund, O.H.W., McPhate, J., Welsh, B.Y. and Vallergera, J. 2011. Possible detection of two giant extrasolar planets orbiting the eclipsing polar UZ Fornacis. *Monthly Notices of the Royal Astronomical Society*, 416: 2202-2211.
- Puglielli, D. 2011. Detecting adiabatic contraction in rotation curves. *Astrophysical Journal*, 739(1): 1-37.
- Rajoelimanana, A., Charles, P.A. and Udalski, A. 2011. Very long-term optical variability of high-mass X-ray binaries in the Small Magellanic Cloud. *Monthly Notices of the Royal Astronomical Society*, 413: 1600-1622.
- Schruba, A., Leroy, A.K., Walter, F., Bigiel, F., Brinks, E., De Blok, W.J.G., Dumas, G., Kramer, C., Rosolowsky, E., Sandstrom, K., Schuster, K., Usero, A., Weiss, A. and Wiesemeyer, H.W. 2011. A molecular star formation law in the atomic-gas-dominated regime in nearby galaxies. *Astronomical Journal*, 142:37. 25pp.
- Schurch, M., Coe, M.J., McBride, V.A., Townsend, L., Udalski, A., Haberl, F. and Corbet, R.H.D. 2011. Orbital period determinations for four SMC Be/X-ray binaries. *Monthly Notices of the Royal Astronomical Society*, 412: 391-400.
- Sloan, G., Hony, S., Smolders, K., Decin, L., Zijlstra, A., Feast, M.W., van Wyk, F., van Loon, J.T.h., Groenewegen, M.A.T. and Sahai, R. 2011. The identification of probable SiS emission at 13-14 μ m in spectra of galactic S stars. *Astrophysical Journal*, 729:121. 7pp.
- Stewart, I., Fenech, D.M. and Muxlow, T.W.B. 2011. A multiple-beam CLEAN for imaging intra-day variable radio sources. *Astronomy & Astrophysics*, 535: A81. 9pp.
- Townsend, L., Coe, M.J., Corbet, R.H.D., McBride, V.A., Hill, A.B., Bird, A.J., Church, M., Haberl, F., Sturm, R., Pathak, D., van Soelen, B., Bartlett, E.S., Drave, S.P. and Udalski, A. 2011. The orbital solution and spectral classification of the high-mass X-ray binary IGR J01054-7253 in the Small Magellanic Cloud. *Monthly Notices of the Royal Astronomical Society*, 410: 1813-1824.
- Warner, B. 2011. The Herschel Condition. *African Yearbook of Rhetoric*, 2(2): 29-40.
- Wittkowski, M., Boboltz, D., Ireland, M., Karovicova, I., Ohnaka, K., Scholz, M., van Wyk, F., Whitelock, P., Wood, P. and Zijlstra, A. 2011. Inhomogeneities in molecular layers of Mira atmospheres. *Astronomy & Astrophysics*, L7: 1-5.
- Woudt, P.A. and Warner, B. 2011. VSX J074727.6 + 065050: A dwarf nova with a non-radially pulsating white dwarf primary. *Astrophysics and Space Science*, 333: 119-123.

Peer-reviewed published conference proceedings

- Carignan, C., Turbide, L. and Koulidiati, J. 2011. *Astrophysics in Burkina Faso*. In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

De Blok, W.J.G. 2011. The MeerKAT Karoo Array Telescope and HI Emission Line Surveys. In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

De Swardt, B. 2011 Near-Infrared Photometric Properties of Nearby Dwarf galaxies using the IRSF. 2011. In T. Nagayama, S. Sato and K. Wakmatsu (eds), *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Feast, M.W. 2011. RR Lyraes and Type II Cepheids in the Magellanic Clouds: Distance Scales and Population Gradients. In A. McWilliam (ed.), *Carnegie Astrophysics Series volume 5, January 2011, Washington 2011*. Washington, USA: The Observatories of the Carnegie Institution of Washington.

Feast, M.W. 2011 The IRSF and AGB Variables in Local Group Galaxies. In T. Nagayama, S. Sato and K. Wakmatsu (eds). *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Frank, B., De Blok, W.J.G. and the HERACLES Team. 2011. Comparisons of CO and HI Dynamics in THINGS Galaxies. In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Holwerda, B.W., Blyth, S.L., Baker, C.J. and Team, L. 2011. Looking at the Distant Universe with the MeerKAT Array (LADUMA). In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Kam, Z.S., Carignan, C., Chemin, L., Hernandez, O., de Deneu-Baillargeon, M. and Djabo, Y. 2011. HI and H Mapping of M31 and M33. In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina*

Faso. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Kraan-Korteweg, R.C. Riad, I.F., Woudt, P.A., Nagayama, T. and Wakamatsu, K. 2011. In T. Nagayama, S. Sato and K. Wakmatsu (eds), *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Kraan-Korteweg, R.C. and Cluver, M.E. 2011. The SED of the nearby HI-massive LIRG HIZIOA J0836-43: from the NIR to the radio domain. In T. Nagayama, S. Sato and K. Wakmatsu (eds), *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Miley, G., Carignan, C. and Govender, K. 2011. Building on IYA2009: IAU Strategic Plan "Astronomy for the Developing World." In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Rajpaul, V. 2011. Genetic algorithms in astronomy and astrophysics. In I. Basson and A.E. Botha (eds), *Proceedings of SAIP2011, the 56th annual conference of the South African Institute of Physics, 12-15 July 2011, St George Hotel, Gauteng, South Africa*. Gauteng, South Africa: Unisa Press. ISBN 978-1-86888-688-3.

Randriamanakoto, Z. and Väisänen, P. 2011. Super Star Cluster Luminosity Functions in Interacting Luminous Infrared Galaxies. In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Randriamanakoto, R., Väisänen, P., Ryder, S. and Mattila, S. 2011. Probing super star clusters in interacting LIRGs using NIR Adaptive Optics. In T. Nagayama, S. Sato and K. Wakamatsu (eds), *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Tekola, A.G., Väisänen, P. and Berlind, B. 2011. The Environments of Luminous IR Galaxies. In C. Carignan,

F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Whitelock, P.A. 2011. Asymptotic giant Branch variables in NGC 6822. In C. Carignan, F. Combes and K. Freeman (eds), *Tracing the Ancestry of Galaxies (on the land of our ancestors): Proceedings of the 277th Symposium of the International Astronomical Union (IAU), 13-17 December 2010, Ouagadougou, Burkina Faso*. Cambridge, UK: Cambridge University Press. ISBN 9780521766029.

Whitelock, P.A. 2011. Large Amplitude variables in NGC6822. In T. Nagayama, S. Sato and K. Wakmatsu (eds). *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Williams, W., Woudt, P.A. and Kraan-Korteweg, R.C. 2011. Deep NIR Photometry of HI Galaxies Behind the Milky Way. In T. Nagayama, S. Sato and K. Wakamatsu (eds), *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

Woudt, P.A., Nagayama, T. and ThunderKAT TEAM. 2011. The IRSF and the transient sky. In T. Nagayama, S. Sato and K. Wakamatsu (eds), *Proceedings of International Workshop held as the 10th Anniversary Celebration: 10 years of IRSF (InfraRed Survey Facility) and the Future, 16-18 November 2010, Nagoya, Japan*. Nagoya, Japan: IRSF 10th Workshop Publishing. ISBN 978-4-9906150-0-0.

DEPARTMENT OF BOTANY

(Including the Bolus Herbarium and the Plant Conservation Unit)

HEAD OF DEPARTMENT: PROFESSOR J.J. MIDGLEY

DEPARTMENTAL PROFILE

Botany is a vibrant department, which strives towards the development of a centre of excellence for research and teaching of the ecology, evolution, physiological ecology and systematics of marine and terrestrial plants of southern Africa. The department includes two research units, the Bolus Herbarium and the Plant Conservation Unit, and is also home to the Department of Environmental Affairs & Tourism Chief Directorate: Marine & Coastal Management. Research thrusts include plant population, community and reproductive ecology, systematics, floristics, biogeography and evolutionary biology of the unique Cape Floral Kingdom and its response to different land use practices, ecology and economics of marine and freshwater algae, the ecophysiology of plant responses to pollution and global change, the physiology of plant nitrogen-fixing symbioses and dendrochronology and palaeoecology. The Plant Conservation Unit focuses on sustainable land use, restoration and palaeoecology/environmental history with an emphasis on the conservation of the vegetation of the winter rainfall region of South Africa, while the Bolus Herbarium is researching the taxonomy of and curating a specimen collection of over a third of a million southern African species. The staff is also active on Research Councils, policy-making forums and advisory committees.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professors	5
Associate Professors	3
Senior Lecturers	2
Lecturers	2
Scientific Staff	2
Technical Support Staff	7
Administrative and Clerical Staff	3
Total	24

Honorary Staff

Honorary Professors	3
Honorary Assoc. Professors	1
Honorary Research Associates	10
Total	14

Students

Postdoctoral	4
Doctoral	26
Master's	22
Honours	14
Undergraduate	414
Total	480

RESEARCH FIELDS AND STAFF

Permanent staff

PROFESSOR JEREMY MIDGLEY

Head of Department; plant ecology; evolutionary biology; forest ecosystem dynamics.

PROFESSOR JOHN J. BOLTON

Phycology; marine and freshwater biology; mariculture.

PROFESSOR WILLIAM J. BOND

Plant ecology; evolutionary biology; conservation biology; fire and community dynamics.

DR SAMSON B. CHIMPHANGO

Physiology; nitrogen fixation.

ASSOCIATE PROFESSOR MICHAEL D. CRAMER

Physiology; ecophysiology; plant nutrition.

DR EDMUND FEBRUARY

Senior Lecturer: palaeoecology; ecophysiology.

DR LINDSEY GILLSON

Deputy Director of the Plant Conservation Unit: conservation ecology; palaeoecology; theoretical ecology; landscape history.

PROFESSOR TERRY HEDDERSON

Plant systematics; bryology; molecular systematics; life history traits.

PROFESSOR M. TIMM HOFFMAN

Director of the Plant Conservation Unit: plant ecology; conservation biology; community ecology; biodiversity.

DR A. MUTHAMA MUASYA

Senior Lecturer: plant systematics; molecular systematics; biogeography.

DR ANTHONY G. VERBOOM

Senior Lecturer: Plant systematics, ecophysiology, biogeography.

Honorary Professors

PROFESSOR RICHARD COWLING

Plant ecology; conservation biology; community ecology; biodiversity.

PROFESSOR JOHN S. DONALDSON

Biodiversity.

PROFESSOR PETER LINDER

Systematics; taxonomy; evolutionary biology.

Honorary Associate Professors

ASSOCIATE PROFESSOR ROBERT J. ANDERSON

Phycology.

Honorary Research Associates

DR N. ALLSOPP

Ecophysiology

DR N. BERGH

Systematics

DR P. CARRICK

Restoration ecology

DR B HARDING

Phycology

DR S. HIGGINS

Ecosystems Ecology.

DR A.G. REBELO

Ecology.

DR R. ROHDE

Environmental Historian.

DR G. SCOTT

Systematics.

DR A. SEYDACK

Forest Ecology.

PROFESSOR C. STIRTON

Plant Systematics.

CONTACT DETAILS

Postal address: Department of Botany, University of Cape Town, Private Bag X3, Rondebosch, 7701, South Africa

Telephone: +27 21 650 2447

Fax: +27 21 650 4041

E-mail: bot-web@uct.ac.za

Web: <http://www.uct.ac.za/depts/botany/>

RESEARCH OUTPUT

Chapters in books

Gillson, L., Laddell, R.J. and Aratijo, M.B. 2011. Baselines, patterns and process. In Laddell and Whittaker (eds), Conservation Biogeography, pp. 31-44. UK: Blackwell Publishing LTD. ISBN 978-1-4443-3504-0.

Gillson, L., Laddell, R.J. and Jepson, P. 2011. Social values and conservation biogeography. In Laddell and Whittaker(eds), Conservation Biogeography, pp. 13-30. UK: Blackwell Publishing LTD. ISBN 978-1-4443-3504-0.

Richardson, F.D. and Hoffman, M.T. 2011. Using models to predict the probability of degradation of rangelands when subjected to different management strategies. In L. Zietsman (ed.), Observations on Environmental Change in South Africa, pp. 109-123. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Articles in Peer-reviewed Journals

Ah-Peng, C. and Bardat, J. 2011. *Microlejeunea strasbergii* sp. nov. (Lejeuneaceae) from Reunion Island (Mascarenes). *Bryologist*, 114: 668-673.

Anderson, P. and Hoffman, M.T. 2011. Grazing response in the vegetation communities of the Kamiesberg, South Africa: Adopting a plant functional type approach. *Journal of Arid Environments*, 75: 255-264.

Antunes, E., Afolayan, A.F., Chiwakata, M.T., Fakee, J., Knott, M., Whibley, C.E., Hendricks, D.T., Bolton, J.J. and Beukes, D. 2011. Identification and *in vitro* anti-esophageal cancer activity of a series of halogenated monoterpenes isolated from the South African seaweeds *Plocamium suhrii* and *Plocamium cornutum*. *Phytochemistry*, 72: 769-772.

Bergh, N. and Verboom, G.A. 2011. Anomalous capitulum structure and monoecy may confer flexibility in sex allocation and life history evolution in the *Ifloga* lineage of paper daisies (Compositae: Gnaphalieae). *American Journal of Botany*, 98(7): 1113-1127.

Bergh, N., Trisos, C. and Verboom, G.A. 2011. Phylogeny of the "*Ifloga* clade" (Asteraceae, Gnaphalieae), a lineage occurring disjointly in the Northern and Southern Hemisphere, and inclusion of *Trichogyne* in synonymy with *Ifloga*. *Taxon*, 60(4): 1065-1075.

Bolton, J.J., Andreakis, N. and Anderson, R.J. 2011. Molecular evidence for three separate cryptic introductions of the red seaweed *Asparagopsis* (Bonnemaisoniales, Rhodophyta) in South Africa. *African Journal of Marine Science*, 33(2): 263-271.

Bowman, D.M.J.S., Balch, J., Artaxo, P., Bond, W.J., Cochrane, M.A., D'Antonio, C.M., DeFries, R.S., Johnston, F.H., Keeley, J., Krawchuk, M.A., Kull, C.A., Mack, M., Moritz, M.A., Pyne, S.J., Roos, C.I., Scott, A., Sodhi, N.S. and Swetnam, T.W. 2011. The human dimension of fire regimes on Earth. *Journal of Biogeography*, 38: 2223-2236.

Bruyns, P.V., Klak, C. and Hanacek, P. 2011. Age and diversity in Old World succulent species of *Euphorbia* (Euphorbiaceae). *Taxon*, 60: 1717-1733.

Cabral, J., Bond, W.J., Midgley, G.F., Rebelo, A.G., Thuiller, W. and Schurr, F. 2011. Effects of harvesting flowers from shrubs on the persistence and abundance of wild shrub populations at multiple spatial extents. *Conservation Biology*, 25: 73-84.

Carvalho, L.G., Veldtman, R., Shenkute, A.G., Tesfay, G.B., Pirk, C.W., Donaldson, J. and Nicolson, S. 2011. Natural and within-farmland biodiversity enhances crop productivity. *Ecology Letters*, 14: 251-259.

Clasen-Bockhoff, R., Oliver, E.G.H., Hall, A. and Quint, M. 2011. A new classification of the South African endemic family Bruniaceae based on molecular and morphological data. *Taxon*, 60(4): 1138-1155.

Coetsee, C., Stock, W.D. and Craine, J.M. 2011. Do grazers alter nitrogen dynamics on grazing lawns in a South African savannah? *African Journal of Ecology*, 49: 62-69.

Ellis, L.T., Akhondji Darzikolaei, S., Shirzadian, S., Bakalin, V.A., Bednarek-Ochyra, H., Ochyra, R., Claro, D., Dulin, M.V., Eckel, P.M., Erzberger, P., Eziz, R., Sulayman, M., Garcia, C., Sergio, C., Stow, S., Hedderson, T.A., Hedenas, L., Kurschner, H., Li, W., Nebel, M., Nieuwkoop, J., Phillipov, D.A., Plasek, V., Sawicki, J., Schafer-Verwimp, A., Stefanut, S. and Vana, J. 2011. New national and regional bryophyte records, 29. *Journal of Bryology*, 33: 316-323.

Emadzade, K., Gehrke, B., Linder, P. and Horandl, E. 2011. The biogeographical history of the cosmopolitan genus *Ranunculus* L (Ranunculaceae) in the temperate to meridional zones. *Molecular Phylogenetics and Evolution*, 58: 4-21.

Estes, J.A., Terborgh, J., Brashares, J.S., Power, M.E., Berger, J., Bond, W.J., Carpenter, S.R., Essington, T.E., Holt, R.D., Jackson, J.B.C., Marquis, R.J., Oksanen, L., Oksanen, T., Paine, R.T., Pickett, E.K., Ripple, W.J., Sandin, S.A., Scheffer, M., Schoener, T.W., Shurin, J.B., Sinclair, A.R.E., Soule, M.E., Virtanen, R. and Wardle, D.A. 2011. Trophic Downgrading of Planet Earth. *Science*, 333: 301-306.

February, E.C., Allsopp, N., Shabane, T. and Hattas, D. 2011. Coexistence of a C₄ grass and a leaf succulent shrub in an arid ecosystem. The relationship between rooting depth, water and nitrogen. *Plant and Soil*, 349: 253-260.

Gehrke, B. 2011. Synopsis of *Carex* (Cyperaceae) from sub-Saharan Africa and Madagascar. *Botanical Journal of the Linnean Society*, 166: 51-99.

Godard-Codding, C.A.J., Clark, R., Fossi, M.C., Marsili, L., Maltese, S., West, A.G., Valenzuela, L., Rowntree, V., Polyak, L., Cannon, J.C., Pinkerton, K., Rubio-Cisneros, N., Mesnick, S.L., Cox, S.B., Kerr, L., Payne, R. and Stegeman, J. 2011. Pacific ocean-wide profile of CYP1A1 expression, stable carbon and nitrogen isotope ratios, and organic contaminant burden in sperm whale skin biopsies. *Environmental Health Perspectives*, 119: 119-343.

Hattas, D., Hjalten, J., Julkunen-Titto, R., Scogings, P.F. and Rooke, T. 2011. Differential phenolic profiles in six African savanna woody species in relation to antiherbivore defense. *Phytochemistry*, 72: 1796-1803.

Hawkins, H.-J., Malgas, R. and Bienabe, E. 2011. Ecotypes of wild rooibos (*Aspalathus linearis* (Burm. F) Dahlg., Fabaceae) are ecologically distinct. *South African Journal of Botany*, 77: 360-370.

Helm, C., Wilson, G., Midgley, J.J., Kruger, L. and Witkowski, E. 2011. Investigating the vulnerability of an African savanna tree *Sclerocarya birrea* ssp. *caffra* to fire and herbivory. *Austral Ecology*, 36: 964-973.

Higgins, S.I., Delgado-Cartay, M.D., February, E.C. and Combrink, H.J. 2011. Is there a temporal niche separation in the leaf phenology of savanna trees and grasses? *Journal of Biogeography*, 38: 2165-2175.

Hoffman, M.T., Cramer, M.D., Gillson, L. and Wallace, M. 2011. Pan evaporation and wind run decline in the Cape Floristic Region of South Africa (1974-2005): implications for vegetation responses to climate change. *Climatic Change*, 109: 437-452.

Hoffman, M.T. and Rohde, R. 2011. Rivers through time: historical changes in the riparian vegetation of the semi-arid, winter rainfall region of South Africa in response to climate and land use. *Journal of the History of Biology*, 44: 59-80.

Johnstone-Robertson, S., Mark, D., Morrow, C., Middelkoop, K., Chiswell, M., Aquino, L., Bekker, L. and Wood, R. 2011. Social mixing patterns within a South African township community: implications for respiratory disease transmission and control. *American Journal of Epidemiology*, 174(11): 1246-1255.

Jonathan Davies, T., Smith, G.F., Bellstedt, D.U., Boatwright, J.S., Bytebier, B., Cowling, M., Forest, F., Harmon, L.J., Muasya, A.M., Schrire, B., Steenkamp, Y., van der Bank, M. and Savolainen, V. 2011. Extinction risk and diversification are linked in a plant biodiversity hotspot. *Plos Biology*, 9(5): 1-9.

Kambatuku, J.R., Cramer, M.D. and Ward, D. 2011. Intraspecific competition between shrubs in a semi-arid savanna. *Plant Ecology*, 212: 701-713.

Kambatuku, J.R., Cramer, M.D. and Ward, D. 2011. Savanna tree-grass competition is modified by substrate type and herbivory. *Journal of Vegetation Science*, 22: 225-237.

Kattge, J., Diaz, S., Lavorel, S., Prentice, I.C., Leadley, P., Bonisch, G., Garnier, E., Westoby, M., Reich, P., Patino, S., Paula, S., Pausas, J.G., Penuelas, J., Phillips, O.L., Pillar, V., Poorter, H., Poorter, L., Poschlod, P., Prinzing, A., Wright, I., Proulx, R., Rammig, A., Reinsch, S., Reu, B., Sack, L., Salgado-Negret, B., Bond, W.J., Sardans, J., Shiodera, S., Shipley, B., Siefert, A., Cornelissen, J.H.C., Sotnik, E., Soussana, J.F., Swaine, E., Swenson, N., Thompson, K., Thornton, P., Waldram, M., Weiher, E., White, M., Wright, S.J., Violle, C., Yguel, B., Zaehle, S., Zanne, A.E., Wirth, C., Harrison, S.P., van Bodegom, P.M., Reichstein, M., Enquist, B., Soudzilovskaia, N.A., Ackerly, D.D., Anand, M., Atkin, O., Bahn, M., Baker, T.R., Baldocchi, D., Bekker, R., Blanco, C.C., Blonder, B., Bradstock, R.A., Bunker, E., Casanoves, F., Cavender-Bares, J., Chambers, J.Q., Chapin III, F.S., Chave, J., Coomes, D., Cornwell, W.K., Craine, J.M., Dobrin, B.H., Duarte, L., Durka, W., Elser, J., Esser, G., Estiarte, M., Fagan, W.F., Fang, J., Fernandez-Mendez, F., Fidelis, A., Finegan, B., Flores, O., Ford, H., Frank, D., Freschet, G.T., Fyllas, N.M., Gallagher, R.V., Green, W.A., Gutierrez, A.G., Hickler, T., Higgins, S.I., Hodgson, J.G., Jalili, A., Jansen, S., Joly, C.A., Kerkhoff, A.J., Kirkup, D., Kitajima, K., Kleyer, M., Klotz, S., Knops, J.M.H., Kramer, K., Kuhn, I., Kurokawa, H., Laughlin, D., Lee, T., Leishman, M., Lens, F., Lewis, S.L., Lloyd, J., Llusia, J., Louault, F., Ma, S., Mahecha, M.D., Manning, P., Massad, T., Medlyn, B.E., Messier, J., Moles, A.T., Muller, S.C., Nadrowski, K., Naeem, S., Niinemets, U., Nollert, S., Nuske, A., Ogaya, R., Oleksyn, J., Onipchenko, V.G., Onoda, Y., Ordonez, J., Overbeck, G. and Ozinga, W.A. 2011. TRY - a global database of plant traits. *Global Change Biology*, 17: 2095-2935.

Keeley, J., Pausas, J.G., Rundel, P.W., Bond, W.J. and Bradstock, R.A. 2011. Fire as an evolutionary pressure shaping plant traits. *Trends in Plant Science*, 16(8): 1360-1385.

Klak, C. 2011. Aizoaceae: New combinations in *Antimima* and *Octopoma* (Ruschioideae). *Bothalia*, 41(2): 292-294.

- Larridon, I., Reynders, M., Huygh, W., Bauters, K., Van de Putte, K., Muasya, M., Boeckx, P., Simpson, D., Vrijdaghs, A. and Goetghebeur, P. 2011. Affinities in C_3 *Cyperus* lineages (Cyperaceae) revealed using molecular phylogenetic data and carbon isotope analysis. *Botanical Journal of the Linnean Society*, 167: 19-46.
- Larridon, I., Huygh, W., Reynders, M., Muasya, A.M., Govaerts, R., Simpson, D. and Goetghebeur, P. 2011. Nomenclature and typification of names of genera and subdivisions of genera in Cyperaceae (Cyperaceae) 2. Names of subdivisions of *Cyperus*. *Taxon*, 60: 868-884.
- Larridon, I., Reynders, M., Huygh, W., Bauters, K., Vrijdaghs, A., Leroux, O., Muasya, A.M., Simpson, D. and Goetghebeur, P. 2011. Taxonomic changes in C_3 *Cyperus* (Cyperaceae) supported by molecular data, morphology, embryography, ontogeny and anatomy. *Plant Ecology and Evolution*, 144(3): 327-356.
- Lawes, M.J., Murphy, B.P., Midgley, J.J. and Russell-Smith, J. 2011. Are the eucalypt and non-eucalypt components of Australian tropical savannas independent? *Oecologia*, 166: 229-239.
- Lawes, M.J., Richards, A., Dathe, J. and Midgley, J.J. 2011. Bark thickness determines fire resistance of selected tree species from fire-prone tropical savanna in north Australia. *Plant Ecology*, 212: 2057-2069.
- Lehmann, C.E.R., Archibald, S., Hoffmann, W.A. and Bond, W.J. 2011. Deciphering the distribution of the savanna biome. *New Phytologist*, 191: 197-209.
- Mandiwana-Neudani, T., Kopuchian, C., Louw, G.J. and Crowe, T. 2011. A study of gross morphological and histological syringeal features of true francolins (Galliformes: Francolinus, Scleroptila, Peliperdix and Dendroperdix spp.) and spurfowls (Ptemistis spp.) in a phylogenetic context. *Ostrich*, 82(2): 115-127.
- Manyanga, P., Soderstrom, L. and Hedderson, T.A. 2011. Co-variation of life history characters in the family Lophoziaceae: a multivariate analysis. *Bryologist*, 114: 583-594.
- Middelkoop, K., Bekker, L., Myer, L., Johnson, L.F., Kloos, M., Morrow, C. and Wood, R. 2011. Antiretroviral therapy and tb nitification rates in a high HIV prevalence South African community. *Jaidis-Journal of Acquired Immune Deficiency Syndromes*, 56(3): 263-269.
- Midgley, J.J., Kruger, L.M. and Skelton, R. 2011. How do fires kill plants? The hydraulic death hypothesis and Cape Proteaceae "fire-resisters". *South African Journal of Botany*, 77: 381-386.
- Moncrieff, G., Chamaille-Jammes, S., Higgins, S.I., O'Hara, R.B. and Bond, W.J. 2011. Tree allometries reflect a lifetime of herbivory in an African savanna. *Ecology*, 92: 2310-2315.
- Morris, T.L., Esler, K., Barger, N., Jacobs, S.M. and Cramer, M.D. 2011. Ecophysiological traits associated with the competitive ability of invasive Australian acacias. *Diversity and Distributions*, 17: 898-910.
- Muasya, A.M., Viljoen, J.-A. and Stirton, C.H. 2011. *Isolepis namaquana* (Cyperaceae, Cyperaceae), a new endemic species from the winter rainfall area of South Africa. *South African Journal of Botany*, 77: 55-58.
- Muasya, A.M., Larridon, I., Reynders, M., Huygh, W., Goetghebeur, P., Cable, S., Simpson, D. and Gehrke, B. 2011. The Cyperaceae in Madagascar show increased species richness in upland forest and wetland habitats. *Plant Ecology and Evolution*, 144(3): 357-362.
- Pauw, A. and Bond, W.J. 2011. Mutualisms matter: pollination rate limits the distribution of oil-secreting orchids. *Oikos*, 120: 1531-1538.
- Potts, A., Midgley, J.J., Child, M.F., Larsen, C. and Hempson, T. 2011. Coexistence theory in the Cape Floristic Region: revisiting an example of leaf niches in the Proteaceae. *Austral Ecology*, 36: 212-219.
- Power, S., Cramer, M.D., Verboom, G.A. and Chimphango, S.B. 2011. Legume seeders of the Cape Floristic Region inhabit more fertile soils than congeneric resprouters - sometimes. *Plant Ecology*, 212: 1979-1989.
- Puttick, J., Hoffman, M.T. and Gambiza, J. 2011. Historical and recent land-use impacts on the vegetation of Bathurst, a municipal commonage in the Eastern Cape, South Africa. *African Journal of Range and Forage Science*, 28(1): 920.
- Ratnam, J., Bond, W.J., Fensham, R.J., Hoffmann, W.A., Archibald, S., Lehmann, C.E.R., Anderson, M.T., Higgins, S.I. and Sankaran, M. 2011. When is a 'forest' a savanna, and why does it matter? *Global Ecology and Biogeography*, 20: 653-660.
- Reynders, M., Huygh, W., Larridon, I., Muasya, A.M., Govaerts, R., Simpson, D.A. and Goetghebeur, P. 2011. Nomenclature and typification of names of genera and subdivisions of genera in the *Cyperaceae* (Cyperaceae): 3. Names in segregate genera of *Cyperus*. *Taxon*, 60: 885-895.
- Schachtschneider, K. and February, E.C. 2010. The relationship between fog, floods, groundwater and tree growth along the lower Kuiseb River in the hyperarid Namib. *Journal of Arid Environments*, 74: 1632-1637.

- Schutz, A., Bond, W.J. and Cramer, M.D. 2011. Defoliation depletes the carbohydrate reserves of resprouting *Acacia* saplings in an African savanna. *Plant Ecology*, 212: 2047-2055.
- Shiponeni, N., Allsopp, N., Carrick, P.J. and Hoffman, M.T. 2011. Competitive interactions between grass and succulent shrubs at the ecotone between an arid grassland and succulent shrubland in the Karoo. *Plant Ecology*, 212: 795-808.
- Sievers, C. and Muasya, A.M. 2011. Identification of the sedge *Cladium mariscus* subsp. *jamaicense* and its possible use in the Middle Stone Age at Sibudu, KwaZulu-Natal. *Southern African Humanities*, 23: 77-86.
- Sirami, C., Brotons, L. and Martin, J. 2011. Woodlarks *Lullula arborea* and landscape heterogeneity created by land abandonment. *Bird Study*, 58: 99-106.
- Stirton, C.H. and Muasya, A.M. 2011. *Aspalathus abbottii* (Fabaceae: Crotalarieae), a new species from KwaZulu-Natal, South Africa. *South African Journal of Botany*, 77: 675-679.
- Turner, R.C., Midgley, J.J. and Johnson, S.D. 2011. Evidence for rodent pollination in *Erica hanekomii* (Ericaceae). *Botanical Journal of the Linnean Society*, 166: 163-170.
- Turner, R.C., Midgley, J.J., Barnard, P., Simmons, R.E. and Johnson, S.D. 2011. Experimental evidence for bird pollination and corolla damage by ants in the short-tubed flowers of *Erica halicacaba* (Ericaceae). *South African Journal of Botany*, 79: 25-31.
- Van Cauter, A., Waldram, M., Moles, A.T., Wallis, I.R., Foley, W.J., Warton, D.I., Stegen, J.C., Bisigato, A.J., Cella-Pizarro, L., Clark, C.J., Cohen, P.S., Cornwell, W.K., Edwards, W., Ejrnaes, R., Gonzales-Ojeda, T., Graae, B.J., Hay, G., Lumbwe, F.C., Magana-Rodriguez, B., Moore, B.D., Peri, P.L., Poulsen, J.R., Veldtman, R., von Zeipel, H., Andrew, N.R., Boulter, S.L., Borer, E.T., Campon, F.F., Coll, M., Farji-Brener, A.G., De Gabriel, J., Jurado, E., Kyhn, L.A., Low, B., Mulder, C.P.H., Reardon-Smith, K., Rodriguez-Velazquez, J., Seabloom, E.W., Veski, P.A., Zheng, Z., Blendinger, P.G., Enquist, B., Facelli, J., Knight, T., Majer, J.D., Martinez-Ramos, M., McQuillan, P. and Prior, L.D. 2011. Putting plant resistance traits on the map: a test of the idea that plants are better defended at lower latitudes. *New Phytologist*, 191: 777-788.
- Verweij, R., Higgins, S.I., Bond, W.J. and February, E.C. 2011. Water sourcing by trees in a mesic savanna: responses to severing deep and shallow roots. *Environmental and Experimental Botany*, 74: 229-236.
- Vrijdaghs, A., Reynders, M., Muasya, A.M., Larridon, I., Goetghebeur, P. and Smets, E. 2011. Morphology and development of spikelets and flowers in *Cyperus* and *Pycreus* (Cyperaceae). *Plant Ecology and Evolution*, 436: 2-21.
- Wakeling, J., Staver, C.A. and Bond, W.J. 2011. Simply the best: the transition of savanna saplings to trees. *Oikos*, 120: 1448-1451.
- Warren, B.H., Bakker, F.T., Bellstedt, D.U., Bytebier, B., Clasen-Bockhoff, R., Dreyer, L.L., Edwards, D., Forest, F., Galley, C., Hardy, C.R., Linder, P., Muasya, M., Mummenhoff, K., Oberlander, K.C., Quint, M., Richardson, J., Savolainen, V., Schrire, B., van der Niet, T., Verboom, G.A., Yesson, C. and Hawkins, J.A. 2011. Consistent phenological shifts in the making of a biodiversity hotspot: the Cape flora. *BMC Evolutionary Biology*, 11:39: 1-11. <http://www.biomedcentral.com/1471-2148/11/39>.
- West, A., Goldsmith, G.R., Matimati, I. and Dawson, T.E. 2011. Spectral analysis software improves confidence in plant and soil water stable isotope analyses performed by isotope ratio infrared spectroscopy (IRIS). *Rapid Communications in Mass Spectrometry*, 25: 2268-2274.
- Whitehead, O.T., Biccard, A. and Griffiths, C.L. 2011. South African pelagic goose barnacles (Cirripedia, Thoracica): substratum preferences and influence of plastic debris on abundance and distribution. *Crustaceana*, 84: 635-649.
- Wilding, N. and Hedderson, T.A. 2011. *Entosthodon jamesonii* and *E. lindigii*: two species new for Africa from the Indian Ocean Islands. *Journal of Bryology*, 33: 326-327.
- Zaloumis, N. and Bond, W.J. 2011. Grassland restoration after afforestation: no direction home? *Austral Ecology*, 36: 357-366.
- Zander, R. and Hedderson, T.A. 2011. *Picobryum*, a new genus of Pottiaceae (Bryophyta) from South Africa, and an erratum for *Acaulonopsis*. *Journal of Bryology*, 33: 130-133.
- Zander, R. and Hedderson, T.A. 2011. A new species of *Crossidium* (Pottiaceae, Bryophyta) from South Africa. *Journal of Bryology*, 33: 304-307.

DEPARTMENT OF CHEMISTRY

(Including the Centre for Supramolecular Chemistry Research, the MRC/UCT Drug Discovery & Development Research Centre and the Scientific Computing Research Unit)

HEAD OF DEPARTMENT: PROFESSOR ALLEN L. RODGERS

DEPARTMENTAL PROFILE

The research activities of the department reflect the wide range and scope of the traditional sub-disciplines of inorganic, organic and physical chemistry, sustained by analytical, spectroscopic and computational methodology. The four main research focus areas are synthetic and medicinal chemistry, supramolecular chemistry, transition metal chemistry as well as biophysical and structural chemistry. Programmes are devoted to fundamental and applied chemical research, and to interdisciplinary studies in which chemistry plays a key role. Synthetic studies are carried out in organic, organometallic and co-ordination chemistry, in order to develop and apply new methodology, and to prepare biologically active compounds, novel catalysts and components of new materials. These studies also provide tools for analytical and separation science, and models for advanced structural and conformational studies. Molecular structure determination with the aid of spectroscopic and X-ray diffraction techniques are two areas of specialisation in the department. The latter technique is employed extensively in investigations into inclusion compounds, polymorphism and related solid-state phenomena. Computational chemistry is a leading area of specialization supported by several state of the art LINUX clusters. Computer code development and modelling applications of biological and industrial problems play a key role in many of the Department's research programmes.

The research enterprise of the Department of Chemistry has recently been recognized and significantly enhanced by the establishment of a Signature Theme in Drug Discovery in which several staff members are participating and by the appointment of two of its permanent staff members to DST/NRF South African National Research Chairs - Professor Kevin Naidoo in *Scientific Computing* and Professor Kelly Chibale in *Drug Discovery*. These highly prestigious appointments have raised the Department's international research profile significantly and contribute substantially to its research outputs.

The Department of Chemistry also has three UCT-accredited research units – the *Centre for Supramolecular Chemistry Research*, the *MRC/UCT Drug Discovery & Development Research Centre* and the *Scientific Computing Research Unit* – which add further prestige to its stature as one of the leading chemistry departments in Africa.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professors	8
Associate Professors	4
Senior Lecturers	3
Lecturers	4
Scientific Officers	5
Technical Officers	9
Research Staff	5
Support Staff	9
Administrative and Clerical Staff	7
Total	54

Honorary Staff

Emeritus Professors	4
Honorary Research Scholar	1
Honorary Research Associates	3
Total	8

Students

Postdoctoral	19
Doctoral	52
Master's	28
Honours	14
Undergraduates	1591
Total	1704

RESEARCH FIELDS AND STAFF

Permanent and long-term contract staff

PROFESSOR SUSAN A. BOURNE

Inclusion chemistry; crystallography; thermal analysis.

PROFESSOR MINO R. CAIRA

Solid state chemistry; drug polymorphism; drug pseudopolymorphism; drug-cyclodextrin inclusion; drug complexation; co-crystallization; drug enantiomeric separation.

PROFESSOR KELLY CHIBALE

Organic synthesis; medicinal chemistry.

ASSOCIATE PROFESSOR BETTE DAVIDOWITZ

Chemical education; curriculum design; writing and communication within the discipline.

PROFESSOR TIMOTHY J. EGAN

Bioinorganic chemistry of the malaria parasite.

ASSOCIATE PROFESSOR DAVID W. GAMMON

Natural products chemistry; phytochemical studies on medicinal plants; carbohydrates; heterogeneous catalysis of organic reactions.

PROFESSOR ROGER HUNTER

Synthesis; indole alkaloids; calixarenes; p-block synthetic methodology.

ASSOCIATE PROFESSOR ALAN T. HUTTON

Organometallic chemistry; co-ordination chemistry; microwave chemistry; electrochemistry.

PROFESSOR GRAHAM E. JACKSON

Nuclear magnetic resonance; computer modelling; metal-ion equilibria; design of metal containing drugs; copper and rheumatoid arthritis.

DR ANWAR JARDINE

Senior Lecturer: medicinal chemistry; chemical biology; enzymology; natural product and organic synthesis; drug design and development.

PROFESSOR KEVIN J. NAIDOO

Computational chemistry; polymers; statistical physics; pharmaceutical drug design.

DR CLIVE OLIVER

Lecturer: self-assembly; large supramolecular assemblies; crystallography; inclusion chemistry.

ASSOCIATE PROFESSOR NEIL RAVENSCROFT

Physicochemical analysis of biologicals; carbohydrates; glycoconjugate and protein vaccines.

PROFESSOR ALLEN L. RODGERS

Kidney stones; urine chemistry; calcium oxalate crystallization.

DR GREGORY S. SMITH

Senior Lecturer: organometallic chemistry; catalysis; metal-containing polymers and dendrimers; bio-organometallic chemistry.

DR GERHARD VENTER

Lecturer: computational chemistry; electronic structure calculations; free energy methods for properties of solutions; ionic liquids.

DR SARAH WILSON

Senior Lecturer.

Senior Scholar**PROFESSOR LUIGI R. NASSIMBENI**

Physical chemistry; thermal analysis; kinetics; inclusion compounds.

Honorary Research Associates**DR SHIRLEY C. CHURMS**

Writing and communication within the discipline.

PROFESSOR RAYMOND J. HAINES

Organometallic chemistry.

DR ELIZABETH TIMME

Assessment of possible immuno-modulatory carbohydrates from local and indigenous plants and fungi.

Emeritus Professors**PROFESSOR JAMES R. BULL**

Organic synthesis; steroidal hormones; 19-norsteroids; estrogens; bioactive steroids; predictive design; cycloaddition.

PROFESSOR PETER W. LINDER

Solution equilibria of cyclodextrin inclusion complexes.

PROFESSOR JOHN R. MOSS

Organometallic chemistry; catalysis; inorganic chemistry; synthesis and properties of new compounds and materials.

PROFESSOR ALISTAIR M. STEPHEN

Carbohydrate chemistry.

Postdoctoral Fellows**DR ANDREW ANDAYI**

New generation of combined drugs to fight tuberculosis

DR CHRIS BARNETT

Porting molecular dynamics software to graphical processing units

DR NYARADZO CHIGORIMBO-TSIKIWA

Biocatalytic modification of natural compounds for metabolite analysis.

DR FREDERIC DOUELLE

Hit to lead and lead optimization medicinal chemistry progression of antimalarial hits.

DR DIEGO GONZALEZ-CABRERA

Hit to lead and lead optimization medicinal chemistry progression of antimalarial hits.

DR EMMA HAGER

Development of water-soluble metallodendrimer catalysts

DR MUKESH JOSHI

Synthesis of less lipophilic chloroquine analogues-active against chloroquine-resistant parasites

DR BORIS-MARKO KUKOVEC

Solid-state studies of large supramolecular assemblies and metal-organic frameworks

DR AMAN MAHAJAN

Synthesis of novel antimalarial molecules using various drug based pharmacophores

DR CLAIRE LE MANACH

Hit to lead and lead optimization medicinal chemistry progression of antimalarial hits.

DR STEFAN LOUW

Synthesis of novel artemisinin hybrid anti-malarial drugs.

DR JESTIN MANDUMPAL

Development of coarse grain molecular dynamics software for protein folding

DR MAIA MEURILLON

New generation of combined drugs to fight Tuberculosis.

DR GRACE MUGUMBATE

Application of in silico Tools to the discovery of novel anti-infective agents.

DR RAJNI SHARMA

Synthesis of N domain selective ACE inhibitors.

DR CANDICE SOARES DE MELO

New generation of combined drugs to fight tuberculosis

DR TAKALANI THEKA

Investigation of the effects of ingestion of carbohydrates sweeteners (glucose, maltitol, lycasin HBC) on kidney stone risk factors in black and white South Africans

DR KARL WILKINSON

Acceleration of GAMESS-UK for graphical processing units reaction mechanism of the CBHI cellulase from *T.Reesei*

DR YASSIR YOUNIS ADAM

Hit to Lead and Lead Optimization Medicinal Chemistry Progression of Antimalarial Hits

CONTACT DETAILS

Tel: +27 21 650 2446

Fax: +27 21 650 5195

e-mail: shanaaz.manie@uct.ac.za

web: <http://www.uct.ac.za/depts/cem>

RESEARCH OUTPUT

Chapters in books

Egan, T.J. 2011. Biomimetic approaches to understanding the mechanism of haemozoin formation. In L. Pramatarova (ed.), *On Biomimetics*, pp. 373-394. Rijeka: InTech Open Access Publisher. ISBN 978-953-307-271-5.

Hutton, A.T. 2011. Nomenclature of organometallic compounds. In G.J. Leigh (ed.), *Principles of Chemical Nomenclature*, pp. 109-132. Cambridge, UK: RCS (Royal Society of Chemistry). ISBN 9781849730075.

Articles in peer-reviewed Journals

André, V., Hardeman, A., Halasz, I., Stein, R.S., Jackson, G.J., Reid, D.G., Duer, M.J., Curfs, C., Duarte, M.T. and Frišćić, T. 2011, Mechano-synthesis of the metallodrug bismuth subsalicylate from Bi₂O₃ and structure of bismuth salicylate without auxiliary organic ligands. *Angewandte Chemie International Edition*, 50: 7858–7861.

Antonels, N.C., Moss, J.R. and Smith, G.S. 2011, Hydroformylation activity of multinuclear rhodium complexes coordinated to dendritic iminopyridyl and iminophosphine scaffolds. *Journal of Organometallic Chemistry*, 696: 2003-2007.

Barnett, C.B., Wilkinson, K.A. and Naidoo, K.J. 2011, Molecular details from computational reaction dynamics for the cellobiohydrolase I glycosylation reaction. *Journal of the American Chemical Society*, 133: 19474-19482.

Báthori, N.B., Lemmerer, A., Venter, G.A., Bourne, S.A. and Caira, M.R. 2011. Pharmaceutical co-crystals with isonicotinamide-vitamin B3, clofibrac acid, and diclofenac-and two isonicotinamide hydrates. *Crystal Growth & Design*, 11: 75-87.

Báthori, N.B., Nassimbeni, L.R. and Oliver, C.L. 2011, Quininium mandelates – a systematic study of chiral discrimination in crystals of diastereomeric salts. *Chemical Communications*, 47: 2670-2672.

Boscaino, A. and Naidoo, K.J. 2011. The extent of conformational rigidity determines hydration in nonaromatic hexacyclic systems. *Journal of Physical Chemistry B*, 115: 2608-2616.

Bourne, S.A., Corin, K., Cruickshank, D.L., Davson, J., Nassimbeni, L.R., Su, H. and Weber, E. 2011. Enclathration of bases by a fluorenyl host: structure, stability and selectivity. *New Journal of Chemistry*, 35: 1556-1561.

Burrows, J.N., Chibale, K., and Wells, T.N.C. 2011. The state of the art in anti-malarial drug discovery and development, *Current Topics in Medicinal Chemistry*, 11:1226-1254.

Cabrera, D.G., Douelle, F., Feng, T.-S., Nchinda, A.T., Younis, Y., White, K.L., Wu, Q., Ryan, E., Burrows, J.N., Waterson, D., Witty, M.J., Wittlin, S., Charman, S.A. and Chibale, K. 2011. Novel orally active antimalarial thiazoles. *Journal of Medicinal Chemistry*, 54: 7713-7719.

Caira, M.R., Georgescu, E., Georgescu, F., Albota, F. and Dumitrascu, F. 2011. Contributions to syntheses of pyrrolo[2,1-a]phthalazines. *Monatshefte für Chemie*, 142: 743-748.

Caira, M.R., Dumitrascu, F., Georgescu, E., Georgescu, F. and Popa, M.M. 2011. New pyrroles from quinazolinium N1-ylides and acetylenic dipolarophiles. *Revue Roumaine de Chimie*, 56(8): 771-776.

Caira, M.R., Georgescu, E., Barbu, L., Georgescu, F. and Dumitrascu, F. 2011. New tri- and tetra-substituted pyrroles *via* quinazolinium N1-ylides. *Arkivoc*, (x): 44-54.

Caira, M.R. 2011. Structural aspects of crystalline derivatized cyclodextrins and their inclusion complexes. *Current Organic Chemistry*, 15: 815-830.

Chellan, P., Chibale, K. and Smith, G.S. 2011. Molecular structure of an unexpected binuclear salicylaldimine semicarbazone palladium(II) complex. *Journal of Chemical Crystallography*, 41: 747-750.

Chellan, P., Stringer, T., Shokar, A., Dornbush, P.J., Vazquez-Anaya, G., Land, K.M., Chibale, K. and Smith, G.S. 2011. Synthesis and *in vitro* evaluation of palladium(II) salicylaldiminato thiosemicarbazone complexes against *Trichomonas vaginalis*. *Journal of Inorganic Biochemistry*, 105: 1562-1568.

Chibale, K. and Guantai, E.M. 2011. Extracting molecular information from African natural products to facilitate unique African-led drug-discovery efforts. *Future Medicinal Chemistry*, 3(3): 257-261.

Chilengi, R., Bashraheil, M. and Nzila, A. 2011. A phase I trial to evaluate the safety and pharmacokinetics of low-dose methotrexate as an anti-malarial drug in Kenyan adult healthy volunteers. *Malaria Journal*, 10(63): 1-9.

Chiririwa, H. and Meijboom, R. 2011. (SP-4-2)-Chlorido{N-[2-(diphenylphosphanyl)-benzylidene]benzylamine-2P,N} (methyl)palladium(II). *Acta Crystallographica Section E-Structure Reports Online*, E67: m1498.

Chiririwa, H., Moss, J.R., Su, H., Hendricks, D. and Meijboom, R. 2011. 1,4-Bis[(2-pyridylethyl)iminomethyl]-benzene. *Acta Crystallographica Section E*, 67:o921 (-o921 remove).

Chiririwa, H., Meijboom, R. and Omondi, B. 2011. 2-(Thiophen-2-yl)-N-(4-((E)-[2-thiophen-2-yl]ethyl)iminomethyl)benzylidene)ethanamine. *Acta Crystallographica Section E*, 67:o922.

Chiririwa, H. and Meijboom, R. 2011. Dichlorido[2-diphenylphosphanyl-N-(pyridin-3-ylmethyl)benzylideneamine-2P,N]platinum(II). *Acta Crystallographica Section E-Structure Reports Online*, E67: m1497.

Chiririwa, H., Meijboom, R. and Omondi, B. 2011. Dichlorido{N-[2-(diphenylphosphanyl)-benzylidene]isopropylamine-κ 2N,P}palladium(II) dimethyl sulfoxide monosolvate. *Acta Crystallographica Section E*, 67:m608-m609.

Chiririwa, H. and Meijboom, R. 2011. Dichlorido{N-[2-(diphenylphosphanyl)benzylidene]-2,6-diisopropylaniline-2P,N}platinum(II). *Acta Crystallographica Section E-Structure Reports Online*, E67: m1496.

Cruickshank, D.L., Bourne, S.A. and Caira, M.R. Solid-state structures and thermal properties of inclusion complexes of the phenylurea herbicide cycluron with permethylated cyclodextrins. *Arkivoc*, (vii): 103-115.

Davidowitz, B. and Rollnick, M. 2011. What lies at the heart of good undergraduate teaching? A case study in organic chemistry. *Chemistry Education Research and Practice*, 12: 355-366.

De Villiers, M.M., Caira, M.R., Li, J., Strydom, S.J., Bourne, S.A. and Liebenberg, W. 2011. Crystallization of toxic glycol solvates of rifampin from glycerin and propylene glycol contaminated with ethylene glycol or diethylene glycol. *Molecular Pharmaceutics*, 8: 877-888.

D'hooghe, M., Kenis, S., Vervisch, K., Lategan, C., Smith, P.J., Chibale, K. and De Kimpe, N. 2011. Synthesis of 2-(aminomethyl)aziridines and their microwave-assisted ring opening to 1,2,3-triaminopropanes as novel antimalarial pharmacophores. *European Journal of Medicinal Chemistry*, 46: 579-587.

D'hooghe, M., Vandekerckhove, S., Mollet, K., Vervisch, K., Dekeukeleire, S., Lehoucq, L., Lategan, C., Smith, P.J., Chibale, K. and De Kimpe, N. 2011. Synthesis of 2-amino-3-arylpropan-1-ols and 1-(2,3-diaminopropyl)-1,2,3-triazoles and evaluation of their antimalarial activity. *Belstein Journal of Organic Chemistry*, 7: 1745-1752.

Domingo, R., Chibale, K. and Sturrock, E.D. 2011. The significance of the Ca substituent in the selective inhibition of matrix metalloproteinases 1 and 9. *Biological Chemistry*, 392: 1003-1010.

Dubar, F., Egan, T.J., Pradines, B., Kuter, D., Ncokazi, K.K., Forge, D., Paul, J-F., Pierrot, C., Kalamou, H., Khalife, J., Buisine, E., Rogier, C., Vezin, H., Forfar, I., Slomianny, C., Trivelli, X., Kapishnikov, S., Leiserowitz, L., Dive, D. and Biot, C. 2011. The antimalarial ferroquine: role of the metal and intramolecular hydrogen bond in activity and resistance. *ACS Chemical Biology*, 6: 275-287.

- Dumitrascu, F., Caira, M.R., Georgescu, E., Georgescu, F., Draghici, C. and Popa, M.M. 2011. Generation of pyrrolo[2,1-a]isoquinoline derivatives from N-ylides: synthetic control and structural characterization. *Heteroatom Chemistry*, 22(6): 723-729.
- Fehér, K., Matthews, R.P., Kövér, K.E., Naidoo, K.J. and Szilágyi, L. 2011. Conformational preferences in diglycosyl disulfides: NMR and molecular modeling studies. *Carbohydrate Research*, 346: 2612-2621.
- Feng, T.-S., Guantai, E.M., Nell, M.J., van Rensburg, C.E.J., Hoppe, H.C. and Chibale, K. 2011. Antiplasmodial and antitumor activity of dihydroartemisinin analogs derived via the aza-Michael addition reaction. *Bioorganic & Medicinal Chemistry Letters*, 21: 2882-2886.
- Feng, T.-S., Guantai, E.M., Nell, M., van Rensburg, C.E.J., Ncokazi, K., Egan, T.J., Hoppe, H.C. and Chibale, K. 2011. Effects of highly active novel artemisinin-chloroquinoline hybrid compounds on β -hematin formation, parasite morphology and endocytosis in *Plasmodium falciparum*. *Biochemical Pharmacology*, 82: 236-247.
- Fucke, K., Anderson, K.M., Filby, M.H., Henry, M., Wright, J., Mason, S.A., Gutmann, M.J., Barbour, L.J., Oliver, C., Coleman, A.W., Atwood, J.L., Howard, J.A.K. and Steed, J.W. 2011. The structure of water in *p*-sulfonatocalix[4]arene. *Chemical European Journal*, 17: 10259-10271.
- Glans, L., Taylor, D., de Kock, C., Smith, P.J., Haukka, M., Moss, J.R. and Nordlander, E. 2011. Synthesis, characterization and antimalarial activity of new chromium arene-quinoline half sandwich complexes. *Journal of Inorganic Biochemistry*, 105: 985-990.
- Govender, P., Renfrew, A.K., Clavel, C.M., Dyson, P.J., Therrien, B. and Smith, G.S. 2011. Antiproliferative activity of chelating *N,O*- and *N,N*-ruthenium(II) arene functionalised poly(propyleneimine) dendrimer scaffolds. *Dalton Transactions*, 40: 1158-1167.
- Guantai, E.M., Ncokazi, K., Egan, T.J., Gut, J., Rosenthal, P.J., Bhampidipati, R., Kopinathan, A., Smith, P.J. and Chibale, K. 2011. Enone- and chalcone-chloroquinoline hybrid analogues: in silico guided design, synthesis, antiplasmodial activity, in vitro metabolism, and mechanistic studies. *Journal of Medicinal Chemistry*, 54: 3637-3649.
- Guantai, E. and Chibale, K. 2011. How can natural products serve as a viable source of lead compounds for the development of new/novel anti-malarials? *Malaria Journal*, 10(suppl 1):S2
- Hans, R.H., Wiid, I.J.F., van Helden, P.D., Wan, B., Franzblau, S.G., Gut, J., Rosenthal, P.J. and Chibale, K. 2011. Novel thiolactone-isatin hybrids as potential antimalarial and antitubercular agents. *Bioorganic & Medicinal Chemistry Letters*, 21: 2055-2058.
- Hunter, R., Msutu, A., Dwyer, C.L., Emslie, N.D., Hunt, R.C., Bezuidenhout, B.C.B. 2011. Facile one-pot synthesis of carbamoylbenzotriazoles directly from CO₂: synthesis of tolbutamide. *Synlett*, 16: 2335-2338.
- Idahosa, K.C., Lee, Y.-C., Nyoni, D., Kaye, P.T. and Caira, M.R. 2011. Baylis-Hillman-derived *N,N'*-disubstituted piperazines: structural and preliminary computational studies. *Tetrahedron Letters*, 52: 2972-2976.
- Kaschula, C.H., Hunter, R., Hassan, H.T., Stellenboom, N., Cotton, J., Zhai, X.Q. and Parker, M.I. 2011. Anti-proliferative activity of synthetic ajoene analogues on cancer cell-lines. *Anti-Cancer Agents in Medicinal Chemistry*, 11: 260-266.
- Khanye, S.D., Gut, J., Rosenthal, P.J., Chibale, K. and Smith G.S. 2011. Ferrocenylthiosemicarbazones conjugated to a poly(propyleneimine) dendrimer scaffold: synthesis and *in vitro* antimalarial activity. *Journal of Organometallic Chemistry*, 696: 3296-3300.
- Khanye, S.D., Wan, B., Franzblau, S.G., Gut, J., Rosenthal, P.J., Smith, G.S. and Chibale, K. 2011. Synthesis and *in vitro* antimalarial and antitubercular activity of gold(III) complexes containing thiosemicarbazone ligands. *Journal of Organometallic Chemistry*, 696: 3392-3396.
- Kuter, D., Chibale, K. and Egan, T.J. 2011. Linear free energy relationships predict coordination and π -stacking interactions of small molecules with ferriprotoporphyrin IX. *Journal of Inorganic Biochemistry*, 105: 684-692.
- Laferriere, C., Ravenscroft, N., Wilson, S., Combrink, J., Gordon, L. and Petre, J. 2011. Experimental design to optimize an *Haemophilus influenzae* type b conjugate vaccine made with hydrazide-derivatized tetanus toxoid. *Glycoconjugate Journal*, 28: 463-472.
- Li, J., Bourne, S.A. and Caira, M.R. 2011. New polymorphs of isonicotinamide and nicotinamide. *Chemical Communications*, 47: 1530-1532.
- Li, J., Bourne, S.A., de Villiers, M.M., Crider, A.M. and Caira, M.R. 2011. Polymorphism of the antitubercular isoxyl. *Crystal Growth & Design*, 11: 4950-4957.
- Mahajan, A., Kremer, L., Louw, S., Guéradel, Y., Chibale, K. and Biot, C. 2011. Synthesis and *in vitro* antitubercular activity of ferrocene-based hydrazones. *Bioorganic & Medicinal Chemistry Letters*, 21: 2866-2868.
- Makhubela, B.C.E., Jardine, A. and Smith, G.S. 2011. Pd nanosized particles supported on chitosan and 6-deoxy-6-amino chitosan as recyclable catalysts for Suzuki-Miyaura

and Heck cross-coupling reactions. *Applied Catalysis A: General*, 393: 231-241.

Matthews, R.P., Venter, G.A. and Naidoo, K.J. 2011. Using solvent binding and dielectric friction to interpret the hydration behavior of complex anions. *Journal of Physical Chemistry B*, 115: 1045-1055.

Mogorosi, M.M., Mahamo, T., Moss, J.R., Mapolie, S.F., Sloomweg, J.C., Lammertsma, K. and Smith, G.S. 2011. Neutral palladium(II) complexes with P,N schiff-base ligands: synthesis, characterization and catalytic oligomerisation of ethylene. *Journal of Organometallic Chemistry*, 696: 3585-3592.

Mugumbate, G., Jackson, G.E. and van der Spoel, D. 2011. Open conformation of adipokinetic hormone receptor from the malaria mosquito facilitates hormone binding. *Peptides*, 32: 553-559.

Naidoo, K.J. 2011, FEARCF a multidimensional free energy method for investigating conformational landscapes and chemical reaction mechanisms. *Science China*, 54(12): 1962-1973.

Nassimbeni, L.R. and Su, H. 2011. Inclusion by a tricyclic host: structures and variability of hydrogen-bonding patterns. *Journal of Chemical Crystallography*, 41: 1528-1533.

Ndakala, A.J., Gessner, R.K., Gitari, P.W., October, N., White, K.L., Hudson, A., Fakorede, F., Shackelford, D.M., Kaiser, M., Yeates, C., Charman, S.A. and Chibale, K. 2011. Antimalarial pyrido[1,2-a]benzimidazoles. *Journal of Medicinal Chemistry*, 54: 4581-4589.

Nkambule, C.M., Kwezi, N.W., Kinfe, H.H., Nokwequ, M.G., Gammon, D.W., Oscarson, S. and Karlsson, E. 2011. Efficient regioselective protection of *myo*-inositol via facile protecting group migration. *Tetrahedron*, 67: 618-623.

Nzila, A., Ma, Z. and Chibale, K. 2011. Drug repositioning in the treatment of malaria and TB. *Future Medicinal Chemistry*, 3(11): 1413-1426.

Peacock- López, E. 2011. Particle a in one-dimensional finite and semi-infinite well revisited. *The Chemical Educator*, 16: 168-174.

Peacock- López, E. 2011. Seasonality as a parrondian game. *Physics Letters A*, 375: 3124-3129.

Potgieter, M. And Davidowitz, B. 2011. Preparedness for tertiary chemistry: multiple applications of the chemistry competence test for diagnostic and prediction purposes. *Chemistry Education Research and Practice*, 12: 193-204.
Ramon, G., Jacobs, A., Nassimbeni, L.R. and Yav-Kabwit, R. 2011. Inclusion compounds of *p*-*tert*-butylcalixarenes:

structures, kinetics and selectivity. *Crystal Growth & Design*, 11: 3172-3182.

Reid, D.G., Jackson, G.J., Duer, M.J. and Rodgers, A.L. 2011. Apatite in kidney stones is a molecular composite with glycosaminoglycans and proteins: evidence from nuclear magnetic resonance spectroscopy, and relevance to Randall's plaque, pathogenesis and prophylaxis. *The Journal of Urology*, 185: 725-730.

Rodgers, A.L., Allie-Hamdulay, S., Jackson, G. and Tiselius, H.-G. 2011. Simulating calcium salt precipitation in the nephron using chemical speciation. *Urological Research*, 39: 245-251.

Rougier, N.M., Cruickshank, D.L., Vico, R.V., Bourne S.A., Caira, M.R., Buján, E.I. and de Rossi, R.H. 2011, Effect of cyclodextrins on the reactivity of fenitrothion. *Carbohydrate Research*, 346: 322-327.

Singh, K., Singh, K., Wan, B., Franzblau, S., Chibale, K. and Balzarini, J. 2011. Facile transformation of Biginelli pyrimidin-2(1H)-ones to pyrimidines. In vitro evaluation as inhibitors of *Mycobacterium tuberculosis* and modulators of cytostatic activity. *European Journal of Medicinal Chemistry*, 46: 2290-2294.

Singh, P., Sachdeva, S., Raj, R., Kumar, V., Mahajan, M.P., Nasser, S., Vivas, L., Gut, J., Rosenthal, P.J., Feng, T.-S. and Chibale, K. 2011. Antiplasmodial and cytotoxicity evaluation of 3-functionalized 2-azetidinone derivatives. *Bioorganic & Medicinal Chemistry Letters*, 21: 4561-4563.

Smith, G.S. and Therrien, B. 2011. Targeted and multifunctional arene ruthenium chemotherapeutics. *Dalton Transactions*, 40: 10793-10800.

Stringer, T., Therrien, B., Hendricks, D.T., Guzgay, H. and Smith, G.S. 2011. Mono- and dinuclear (6-arene) ruthenium(II) benzaldehyde thiosemicarbazone complexes: synthesis, characterization and cytotoxicity. *Inorganic Chemistry Communications*, 14: 956-960.

Tanaka, K., Hori, K., Masumoto, A., Arakawa, R. and Caira, M.R. 2011. Synthesis, structures and inclusion properties of tetranaphthalides: new macrocyclic clathrate hosts. *Tetrahedron*, 67: 2911-2915.

Wilkinson, K.A., Sherwood, P., Guest, M.F. and Naidoo, K.J. 2011. Acceleration of the GAMESS-UK electronic structure package on graphical processing units. *Journal of Computational Chemistry*, 32: 2313-2318.

Young, R.M., Popplewell, W.L., Caira, M.R., van Zyl, R.L. and Davies-Coleman, M.T. 2011. Synthesis and antiplasmodial activity of 8, 13 β -dihydroxypodocarpene derivatives. *Journal of Chemical Research*, 35(1): 18-23.

Zheng, F., Sivaramakrishna, A. and Moss, J.R. 2011. Thermolysis studies on platinacycloalkane complexes. *Journal of Organometallic Chemistry*, 696: 2457-2465.

Zishiri, V.K., Hunter, R., Smith, P.J., Taylor, D. Summers, R., Kirk, K., Martin, R.E. and Egan, T.J. 2011. A series of structurally simple chloroquine chemosensitizing dibemethin derivatives that inhibit chloroquine transport by PfCRT. *European Journal of Medicinal Chemistry*, 46: 1729-1742.

Zishiri, V.K., Joshi, M.C., Hunter, R., Chibale, K., Smith, P.J., Summers, R.L., Martin, R.E. and Egan, T.J. 2011. Quinoline antimalarials containing a dibemethin group are active against chloroquinone-resistant *Plasmodium falciparum* and inhibit chloroquine transport via the *P. falciparum* chloroquine-resistance transporter (PfCRT). *Journal of Medicinal Chemistry*, 54: 6956-6968.

DEPARTMENT OF COMPUTER SCIENCE

(Including the Information and Communications Technology Centre for Development [ICT4D])

The mission of the Computer Science Department is to develop and impart knowledge and skills in the field of computer science.

Our vision is to strive to be a department of the first rank in both an International and in an African context, sustaining: high respect for its research and post-graduate education excellence in teaching in order to produce graduates who possess the skills that are needed whenever decision making or creative thinking takes place an influential role in industry and the Information Technology community

Our role is:

- to produce graduates with knowledge and skills relevant to both the International and the South African Information Technology community
- to carry out innovative research which adds to basic understanding
- to produce service courses and provide research assistance in the fields of science and engineering
- to provide services to Industry through technology transfer and applied research
- to take an active part in the academic affairs of the University to influence government policy in the field of Information Technology

RESEARCH UNITS ASSOCIATED WITH THE DEPARTMENT

Advanced Information Management (Co-ordinator: Associate Professor S. Berman). This laboratory deals with multiple facets of the information processing problem, exemplified by the following active research areas: databases; knowledge management systems; peer-to-peer computing; distributed computing and Web-based systems.

Intelligent Systems and Advanced Telecommunication (Co-ordinator: Dr A. Bagula). The aim of this research group is to advance the science and engineering of intelligent systems and their applications. Our main research activities are in the design, modelling, simulation and prototype implementation of intelligent systems with a specific focus on (1) novel speech and vision based human computer interaction and (2) exact and heuristic optimization methods using Evolutionary techniques, Neural networks, Immune systems and Statistical models to solve telecommunication problems.

Digital Libraries (Co-ordinator: Assoc. Prof. H. Suleman). Research areas covered within digital libraries include information storage and retrieval; multilingual retrieval; Web-based systems; scalable and flexible repositories; interoperability and protocols; component-based systems; Open Access; and cultural heritage preservation.

High Performance Simulation and Visual Computing (Co-ordinator: Associate Professor James Gain, Associate Professor Michelle Kuttel, Dr Patrick Marais). This research group focuses on the application of high performance tools (primarily multi-core and graphics hardware) and visualization techniques to problems in the domains of astronomy, computational chemistry, computer animation, digital heritage preservation and medical imaging.

ICT for Development Centre (Director: Professor G. Marsden). The UCT Centre in ICT for Development seeks to create ICTs that are appropriate for developing nations. To date, most innovation in ICT has been driven by the developed world to meet challenges originating from that context. This centre will design, create and evaluate technologies that address the needs of the developing world and the people who live there.

Network and Information Security Team (Co-ordinator Dr A Kayem). This group has two streams: Network Security and Information Security. Network security is headed by Dr. A. Hutchison and aims to design and implement protocols for secure communications on the Web. Application examples include web services, cloud computing environments, and enterprise environments. Information security is headed by Dr. A. Kayem and aims to design mechanisms for

secure data storage on the web. Application scenarios include service oriented architectures; secure databases, mobile and/or fragmented data. We aim to evolve these schemes in unconventional ways to enable adaptability to changes in the state of the data or the system.

2011 highlights include:

The South African Square Kilometre Array Project: The MeerKAT High Performance Computing (HPC) for Radio Astronomy Research Programme awarded a local Computer Science-Astronomy collaboration [comprising Dr Sarah Blyth (UCT Astronomy), James Gain, Michelle Kuttel, Patrick Marais (principal investigator), Kurt van der Heyden (UCT Astronomy) and Catherine Cress (UWC Astronomy)] R3,200,000 for the period 2011-2014 for a project on Developing Efficient Software for Large-Scale Radio Interferometry. There are currently 3 MSc students and 1 PhD student in Computer Science working on the project.

STAFF AND STUDENTS

Permanent and long-term contract staff

Professors	3
Associate Professors	1
Honorary Professors	1
Associate Professors	4
Senior lecturers	5
Lecturers	1
Technical Support Staff	2
Administrative and Clerical Staff	4
Total	20

Students

Doctoral	18
Master's	66
Honours	36
Undergraduate	670
Total	790

RESEARCH FIELDS AND STAFF

ASSOCIATE PROFESSOR SONIA BERMAN

Head of Department; Databases; conceptual modeling; persistent programming languages; object-oriented databases.

PROFESSOR KENNETH MACGREGOR

Client server; object technology.

PROFESSOR EDWIN BLAKE

Human-computer interaction; information technology and socio-economic development; collaborative virtual environments; information and communication technology policies.

PROFESSOR GARY MARSDEN

Human computer interaction; ICT4D and mobile computing applications.

DR ANTOINE BAGULA

Senior Lecturer; network traffic engineering; wireless networking; network security.

DR JAMES GAIN

Senior Lecturer; computer graphics; geometric modelling; visualization.

DR PATRICK MARAIS

Senior Lecturer; image processing; computer graphics; GPGPU computing.

ASSOC. PROF. MICHELLE KUTTEL

Computational science; parallel and high performance computing, molecular modelling, scientific visualization.

DR. ANNE V.D.M. KAYEM

Senior Lecturer: information security; applied cryptography; unconventional security approaches.

DR HANH LE

Senior Lecturer; overlay networks; sensor networks.

DR AUDREY MBOGHO

Senior Lecturer; visual and speech inputs; genetic algorithms; software engineering.

ASSOCIATE PROFESSOR HUSSEIN SULEMAN

Digital libraries; information retrieval; Internet technology; high performance computing.

MR GARY STEWART

Lecturer (ADP); human computer interaction.

CONTACT DETAILS

Postal address: Department of Computer Science, University of Cape Town, Private Bag X3, Rondebosch, 7701

Telephone: +27 21 650 2663

Fax: +27 21 650 3551

Web: <http://www.cs.uct.ac.za/>

UCT General enquiries: +27 21 650 9111

UCT web: <http://www.uct.ac.za/>

Email: dept@cs.uct.ac.za

RESEARCH OUTPUT

Chapters in books

Kayem, A.V.D.M., Martin, P. and Akl, S.G. 2011. Self-protecting access control: mitigating vulnerabilities and inefficiencies with fault-tolerance. In *Privacy Protection Measures and Technologies in Business Organizations: Aspects and Standards*, IGI Global (IGI), PA, USA, pp. 95 -128.

Articles in Peer-reviewed Journals

Blake, E.H. and Ladeira, I. 2011. Cultural reinterpretation and resonance: the San and hip-hop. *Computers & Graphics-UK*, 35(2): 383-391.

Boyinbode, O., Bagula, A.B. and Ng'ambi, D. 2011. An opencast mobile learning framework for enhancing learning in higher education. *International Journal of u-and e- Service, Science and Technology*, 4(3): 11-18.

Kayem, A., Martin, P. and Akl, S. 2011. Enhancing identity trust in cryptographic key management systems for dynamic environments. *Security and Communication Networks*, 4(1): 79-94.

Kuttel, M. 2011. Conformational free energy of carbohydrates. *Mini-Reviews in Organic Chemistry*, 8(3), 256-262.

Maunder, A., Marsden, G. and Harper, R. 2011. Making the link-providing mobile media for novice communities in the developing world. *International Journal of Human-Computer Studies*, 69: 647-657.

Reitmaier, T., Bidwell, N. and Marsden, G. 2011. Situating digital storytelling within African communities. *International Journal of Human-Computer Studies*, 69: 658-668.

Salami, O., Bagula, A.B. and Chan, H.A. 2011. Framework for link reliability in inter-working multi-hop wireless networks. *Mathematical and Computer Modelling*, 53(11-12): 2219-2228.

Salazar, G.A., Jimenez, R.C., Alexander, G., Hermjakob, H., Mulder, N.J. and Blake, E.H. 2011. DAS writeback: a collaborative annotation system. *BMC Bioinformatics*, 12: 143. 8pp.

Peer-reviewed published conference proceedings

Bidwell, N., Lalmas, M., Marsden, G., Dlutu, B., Ntlangano, S., Manjingolo, A., Tucker, W., Jones, M., Robinson, S., Vartiainen, E. and Klampanos, I. 2011. Please call ME.N.U.4EVER: Designing for 'Callback' in Rural Africa. In J. Minoi, A.W. Yeo and J. Abdelnour-Nocera (eds), *Proceedings of the Tenth International Workshop on*

Internationalisation of Products and Systems (IWIPS 2011), 11-14 July 2011, Kuching, Malaysia. Malaysia: Product & Systems Internationalisation, Inc. ISBN 0-9722184-6-7.

Boneke Nokonoko, D., Lusilao-Zodi, G., Bagula, A.B. and Dlodlo, M.E. 2011. An energy-efficient routing protocol for hybrid-RFID sensor network. In *Proceedings of IEEE 2011 AFRICON*, 13-15 September 2011, Victoria Falls, Livingstone, Zambia. Zambia: IEEE. ISBN 978-1-61284-991-1.

Boyinbode, O. and Bagula, A.B. 2011. An adaptive and personalized ubiquitous learning middleware support for handicapped learners. In S. Latifi (ed.), *Proceedings of the 2011 Eighth International Conference on Information Technology: New Generations (ITNG 2011)*, 11-13 April 2011, Las Vegas, Nevada, USA. USA: IEEE Computer Society. ISBN 978-7695-4367-3.

Chepken, C., Blake, E.H. and Marsden, G. 2011. Day Labour mobile electronic data capture and browsing system. In I. Brown, K. Sewchurran and H. Suleman (eds), *Proceedings of SAICSIT 2011 (SAICSIT '11)*, 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Chepken, C., Blake, E.H. and Marsden, G. 2011. Software design for informal setups: centring the benefits. In S. Scriba (ed.), *Proceedings of the Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2011*, 4-7 September 2011, East London Convention Centre, South Africa. East London, South Africa: Southern African Telecommunications Networks & Applications Conference (SATNAC). ISBN 978-0-620-50893-3.

Chissungu, E., Blake, E.H. and Le, H. 2011. Investigation into Batman-adv protocol performance in an indoor mesh potato testbed. In F. Xhafa, L. Barolli and M. Kppen (eds), *Proceedings of the Third IEEE International Conference on Intelligent Networking and Collaborative Systems (IEEE INCOS 2011)*, 30 November-2 December 2011, Fukuoka, Japan. USA: IEEE Computer Society. ISBN 978-0-7695-4579-0.

Chissungu, E., Blake, E.H. and Le, H. 2011. Investigation into BATMANd-0.3.2 protocol performance in an indoor mesh potato testbed. In I. Brown, K. Sewchurran and H. Suleman (eds), *Proceedings of SAICSIT 2011 (SAICSIT '11)*, 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Crause, J., Flower, A. and Marais, P.C. 2011. A system for real-time deformable terrain. In I. Brown, K. Sewchurran and H. Suleman (eds), *Proceedings of SAICSIT 2011 (SAICSIT '11)*, 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Kapuire, G. and Blake, E.H. 2011. An attempt to merge local and technological paradigms in the digital representation of indigenous knowledge. In N. Bidwell and H. Winschiers-Theophilus (eds), Proceedings of Indigenous Knowledge Technology Conference 2011, 2-4 November 2011, Windhoek, Namibia. Namibia: Polytechnic Press, Windhoek, Namibia. ISBN 978-99945-72-37-3.

Kayem, A., Martin, P. and Akl, S. 2011. Efficient enforcement of dynamic cryptographic access control policies for outsourced data. In H.S. Venter, M. Coetzee and M. Looock (eds), Proceedings of the 2011 Information Security for South Africa (ISSA 2011) Conference, 15-17 August 2011, Johannesburg, South Africa. Johannesburg: IEEE. ISBN 978-1-4577-1483-2.

Koletka, R. and Hutchison, A. 2011. An architecture for secure searchable cloud storage. In H.S. Venter, M. Coetzee and M. Looock (eds), Proceedings of the 2011 Information Security for South Africa (ISSA 2011) Conference, 15-17 August 2011, Johannesburg, South Africa. Johannesburg: IEEE. ISBN 978-1-4577-1483-2.

Kuttel, M., Mao, Y., Widmalm, G. and Lundborg, M. 2011. CarbBuilder: an adjustable tool for building 3D molecular structures of carbohydrates for molecular simulation. In B. Werner (ed.), Proceedings of 2011 Seventh IEEE International Conference on eScience (eScience 2011), 5-8 December, 2011, Stockholm, Sweden. USA: IEEE Computer Society. ISBN 978-0-7695-4597-4.

Ladeira, I., Marsden, G. and Green, L.J. 2011. Designing interactive storytelling: a virtual environment for personal experience narratives. In P. Campos, N. Graham, J. Jorge, N. Nunes, P. Palanque and M. Winckler (eds), Proceedings, Part 1: INTERACT 2011 - 13th IFIP TC 13 International Conference, 5-9 September 2011, Lisbon, Portugal. Germany: Springer Heidelberg Dordrecht. ISBN 978-3-642-23773-7.

Mabande, T.M., Bagula, A.B., Balikuddembe, J. and Machaka, P. 2011. A comparative evaluation of business intelligence technologies with application to product profiling. In Proceedings of Bionetics 2011, 5-7 December 2011, York, England. Germany: Springer. ISBN 978-1-936968-40-4.

Mabande, T.M., Machaka, P. and Bagula, A.B. 2011. Monitoring of a large Wi-Fi hotspots network: performance investigation of soft computing techniques. In Proceedings of Bionetics 2011, 5-7 December 2011, York, England. Germany: Springer. ISBN 978-1-936968-40-4.

Machaka, P., Bagula, A.B. and de Wet, N. 2011. A highly scalable monitoring tool for Wi-Fi networks. In S. Scriba (ed.), Proceedings of the Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2011, 4-7 September 2011, East London Convention Centre,

South Africa. East London, South Africa: Southern African Telecommunications Networks & Applications Conference (SATNAC). ISBN 978-0-620-50893-3.

Machaka, P. and Bagula, A.B. 2011. Preemptive performance monitoring of a large network of Wi-Fi hotspots: an artificial immune system. In X. Masip-Bruin, D. Verchere, V. Tsaoussidis and M. Yannuzzi (eds), Proceedings of the 9th IFIP TC 6 International Conference, WWIC 2011, 15-17 June 2011, Vilanova i la Geltru, Spain. Germany: Springer Heidelberg Dordrecht. ISBN 978-3-642-21559-9.

Masinde, E. and Bagula, A.B. 2011. A framework for integrating indigenous knowledge with wireless sensors in predicting droughts in Africa. In N. Bidwell and H. Winschiers-Theophilus (eds), Proceedings of Indigenous Knowledge Technology Conference 2011, 2-4 November 2011, Windhoek, Namibia. Namibia: Polytechnic Press, Windhoek, Namibia. ISBN 978-99945-72-37-3.

Masinde, E. and Bagula, A.B. 2011. The role of ICTs in quantifying the severity and duration of climatic variations - Kenya's case. In Proceedings of the 2011 ITU Kaleidoscope Academic Conference, 12-14 December, 2011, Cape Town, South Africa. Cape Town: International Telecommunication Unit (ITU). ISBN 978-92-61-13651-2.

Meissner, F. and Blake, E.H. 2011. Consequences of software design decisions for low-income communities: a case study. In S. Scriba (ed.), Proceedings of the Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2011, 4-7 September 2011, East London Convention Centre, South Africa. East London, South Africa: Southern African Telecommunications Networks & Applications Conference (SATNAC). ISBN 978-0-620-50893-3.

Meissner, F. and Blake, E.H. 2011. Understanding culturally distant end-users through intermediary-derived personas. In I. Brown, K. Sewchurran and H. Suleman (eds), Proceedings of SAICSIT 2011 (SAICSIT '11), 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Mugwanya, R. and Marsden, G. 2011. Using paper prototyping as a rapid participatory design technique in the design of MLCAT - a lecture podcasting tool. In I.A. Sanchez and P. Isaias (eds), Proceedings of the IADIS International Conference Mobile Learning 2011, 10-12 March 2011, Avila, Spain. Spain: IADIS Press. ISBN 978-972-8939-45-8.

Mustafa, M., Osman, I. and Suleman, H. 2011. Indexing and weighting of multilingual and mixed documents. In I. Brown, K. Sewchurran and H. Suleman (eds), Proceedings of SAICSIT 2011 (SAICSIT '11), 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Nkoloma, M., Zennaro, M. and Bagula, A.B. 2011. SM2: Solar Monitoring System in Malawi. In Proceedings of the 2011 ITU Kaleidoscope Academic Conference, 12-14 December, 2011, Cape Town, South Africa. Cape Town: International Telecommunication Unit (ITU). ISBN 978-92-61-13651-2.

Reitmaier, T. 2011. She looked deep into our eyes: reflections on cross-cultural practice. In N. Bidwell and H. Wanschiers-Theophilus (eds), Proceedings of Indigenous Knowledge Technology Conference 2011, 2-4 November 2011, Windhoek, Namibia. Namibia: Polytechnic Press, Windhoek, Namibia. ISBN 978-99945-72-37-3.

Salami, O., Bagula, A.B. and Chan, H.A. 2011. Traffic engineering framework for inter-working multi-hop wireless networks. In Proceedings of 2011 IEEE Global Telecommunications Conference - Globecom 2011, 5-9 December 2011, Houston, Texas. USA: IEEE. ISBN 9781424492664.

Smith, G. and Marsden, G. 2011. Providing media download services in African taxis. In I. Brown, K. Sewchurran and H. Suleman (eds), Proceedings of SAICSIT 2011 (SAICSIT '11), 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Ssekakubo, G., Suleman, H. and Marsden, G. 2011. Issues of adoption: have E-learning management systems fulfilled their potential in developing countries? In I. Brown, K. Sewchurran and H. Suleman (eds), Proceedings of SAICSIT 2011 (SAICSIT '11), 3-5 October 2011, Cape Town, South Africa. New York: ACM. ISBN 978-1-4503-0878-6.

Talbot, M.J. and Marsden, G. 2011. SHOP-Net: moving from paper to mobile. In S. Scriba (ed.), Proceedings of the Southern Africa Telecommunication Networks and Applications Conference (SATNAC) 2011, 4-7 September 2011, East London Convention Centre, South Africa. East London, South Africa: Southern African Telecommunications Networks & Applications Conference (SATNAC). ISBN 978-0-620-50893-3.

Thompson, J., Bainbridge, D. and Suleman, H. 2011. Towards very large scale digital library building in greenstone using parallel processing. In C. Xing, F. Crestani and A. Rauber (eds), Proceedings of the 13th International Conference on Asia-Pacific Digital Libraries, ICADL 2011, 24-27 October 2011, Beijing, China. Germany: Springer-Verlag Berlin Heidelberg. ISBN 978-3-642-24825-2.

Webley, L., Chipeperewa, T. and Suleman, H. 2011. Creating a national electronic thesis and dissertation portal in South Africa. In Proceedings of the 14th International Symposium on Electronic Theses and Dissertations (ETD 2011), 13-17 September 2011, Cape Town. South Africa: National Research Foundation. ISBN 978-0-620-51049-3.

Williams, K. and Suleman, H. 2011. Creating a handwriting recognition corpus for Bushman languages. In C. Xing, F. Crestani and A. Rauber (eds), Proceedings of the 13th International Conference on Asia-Pacific Digital Libraries, ICADL 2011, 24-27 October 2011, Beijing, China. Germany: Springer-Verlag Berlin Heidelberg. ISBN 978-3-642-24825-2.

DEPARTMENT OF ENVIRONMENTAL AND GEOGRAPHICAL SCIENCE

(Including the Environmental Evaluation Unit and the Disaster Mitigation for Sustainable Livelihood Project)

HEAD OF DEPARTMENT: PROFESSOR M.E. MEADOWS

DEPARTMENTAL PROFILE

The interaction between humans and their environment and the variability of this environment is a common theme in the department's teaching activities and research initiatives. Details of the particular foci are given below. The department has ongoing research initiatives with numerous overseas institutions. These include: the Centre of Earth Sciences of Pennsylvania State University; Centre for Global Studies, University of Gothenburg; the Iowa State University; the University of British Columbia; the Institute of Southern African Studies; the National University of Lesotho; University of Western Australia; the University of Melbourne; the University of Northern British Columbia; Oregon State University; the Department of African Studies of the University of Mainz; the Department of Human Geography and Sociology, University of Oslo; the Department of Geography at the University of Brighton; Southern African Research Centre, Queens University; University of Sheffield; University of Oxford; the Departments of Geography at the University of Paris X Nanterre and the University of Paris IV Sorbonne in France and the Department of Geography at the University of Bonn; Frederik Schiller University, Jena, Germany; University of Leicester, UK; Université Montpellier II, France and the Department of Geography at the University of Oulu. There are also links with the United Kingdom Meteorological Office, the Scripps Oceanographic Institute in California and the CSIRO Atmospheric Research and Marine Research in Australia.

The Environmental Evaluation Unit was established as an independent professional consulting, research and training unit within the Department of Environmental and Geographical Science in 1985, based at the University of Cape Town. During the past 20 years, the EEU has completed over 150 consulting assignments and projects for private, institutional and government clients. The EEU

has established itself as a centre of excellence in the field of environmental management, sustainable development, and natural resource management in Africa, particularly within the SADC region (projects have been completed in South Africa, Botswana, Namibia, Mozambique, Lesotho, Swaziland and the Seychelles).

The Disaster Mitigation for Sustainable Livelihoods Project (DiMP) has been active at UCT since 1998. DiMP undertakes a diverse suite of activities, including disaster risk research into small, medium and large disasters in the Cape Metropolitan Area and past disaster research following declared disasters. It is also the secretariat for a southern African disaster risk reduction network called 'Periperi' (partners enhancing resilience to people exposed to risks).

DEPARTMENTAL STATISTICS

Permanent and Long-term Contract Staff

Professors	3
Associate Professors	3
Senior Lecturers	2
Lecturers	6
Research Staff	20
Research Associates	2
Administrative & Support Staff	16
Total	52

Emeritus & Honorary Staff

Honorary Professors	3
Emeritus Staff	2

Students

Postdoctoral	10
Doctoral	39
Master's	73
Honours	25
Undergraduate	930
Total	1077

RESEARCH FIELDS AND STAFF

Permanent Academic Staff

DR BABATUNDE ABIODUN

Lecturer; atmospheric science; climatology.

DR PIPPIN ANDERSON

Lecturer; Postgraduate co-ordinator.

DR SHARI DAYA

Lecturer; gender; modernity.

DR FRANK ECKARDT

Senior Lecturer; geomorphology; remote sensing.

PROFESSOR BRUCE HEWITSON

DST/NRF SARChI Chair in Climate Change; atmospheric science; climatology.

DR RICHARD HILL

Senior Lecturer; environmental assessment and management.

PROFESSOR MIKE MEADOWS

Head of Department; quaternary environmental change.

ASSOCIATE PROFESSOR SOPHIE OLDFIELD

Political and economic geography.

PROFESSOR SUE PARNELL

Urban studies; historical geography.

ASSOCIATE PROFESSOR MAANO RAMUTSINDELA

Political geography; transboundary environments.

ASSOCIATE PROFESSOR MERLE SOWMAN

Environmental planning and management; coastal and small-scale fisheries management.

DR MARK TADROSS

Senior Researcher; CSAG climate modelling; seasonal forecasting.

DR. KEVIN WINTER

Lecturer; environmental management; water resources; monitoring and evaluation.

DR GINA ZIERVOGEL

Lecturer; vulnerability and adaptation.

Contract Academic Staff

DR RACHEL WYNBERG

Senior Researcher; biodiversity and social justice; commercial use of biodiversity; access and benefit sharing.

Long-term Contract Staff

DR JANE BATTERSBY-LENNARD

Lecturer; urban social and cultural geography; urban food security; geography of education.

DR MARIA HAUCK

Coastal and small-scale fisheries management.

DR AILSA HOLLOWAY

Disaster risk research.

DR PETER JOHNSTON

Seasonal forecasting applications; climate change.

Contract Research Staff

MS JESSY APPAVOO-MOODLEY

Intern: coastal small-scale fisheries management, EIA, social scoping reports.

MS LISA COOP

Research assistant; climate data analysis.

MS TARYN DE BEER

Intern: EIA, social scoping reports.

MS GILLIAN FORTUNE

Risk reduction; knowledge management.

MS PHILILE NONHLANHLA MBATHA

Junior researcher: coastal and marine management.

MS KASHIEFA PARKER

Research assistant; coastal and small-scale fisheries management.

MS SANDRA RIPPON

Senior researcher; EIA, alternative energy.

MS NATALIE SCHELL

Intern: small-scale fisheries.

MS KIRSTEN SCOTT

Research assistant; EIA, social scoping reports.

MS ANNA STEYNOR

Research associate; stakeholder engagement.

MS JACKIE SUNDE

Research assistant; fisheries.

MS KATE SUTHERLAND

Research assistant; climate data analysis.

MS MATHILDA JACI VAN NIEKERK

Research assistant: biodiversity and social justice; commercial use of biodiversity; access and benefit sharing.

MS RUWANI WALAWEGE

Research assistant; climate data analysis.

MS PATRICIA ZWEIG

Disaster risk co-ordinator.

Administrative and Support Staff

MRS SHARON ADAMS

Administrative Officer

MR ALDINO ARENDSE

Administrative and Financial Co-ordinator

MRS SHARON BARNARD

Administrative Assistant

MR ROGER DUFFETT

IT Manager

MR TONY GEORGE

Library Assistant

MS FAHDELAH HARTLEY

Senior Secretary

MR SAYED HESS

Laboratory Departmental Assistant

MR CHRIS JACK

Senior Scientific Technical Officer

MS VUYOKAZI MAFUNYA

Administrative Assistant

MR PHILLIP MUKWENA

IT Assistant

MS ITHRA NAJAAR

Administrative Assistant

MS NOLUFEFE NGAYE

Senior Secretary

MS SYLVIA PRIME

Administrative Manager

MRS SHAADA REDDY

Librarian

MS SHAHIEDA SAMSODIEN

Senior Secretary

MS PATRICIA WURST

Translator

Postdoctoral Fellows

DR OLIVIER CRESPO

Agricultural and water research modelling.

DR ALICE FAVRE

Climate change, atmospheric systems.

DR EVANGELIANA KALOGNOMOU

Climate variability and change; multi-model ensemble analysis.

DR CHRIS LENNARD

Atmospheric science.

DR NEIL MACKELLAR

Climate and land-cover change.

DR RUTH CEREZO MOTA

Climate change; atmospheric systems.

DR KABIRI NGETA

Environmental governance for social justice.

DR KAZEEM OARE OKOSUN

Epidemiological modelling and climate impact.

DR SERGE RAEMAEKERS

Small-scale fisheries governance.

DR DAITHI STONE

Detection and attribution of climate change.

Honorary Professors

PROFESSOR JOHN BOARDMAN

Soil erosion; land degradation.

PROFESSOR JONATHAN CRUSH

International migration; transnationalism.

PROFESSOR DAVE THOMAS

Arid zone geomorphology; quaternary science.

Research Associates

DR LAURENCE NATHAN

DR DAVID FIG

Emeritus Staff

PROFESSOR RON DAVIES

PROFESSOR RICHARD FUGGLE

CONTACT DETAILS

Postal address: Department of Environmental and Geographical Science, University of Cape Town, Private Bag X3, Rondebosch, 7701

Telephone: SA (21) 650 2873/4

Fax: SA (21) 650 3456

E-mail: admin@enviro.uct.ac.za

Web: <http://www.egs.uct.ac.za>

RESEARCH OUTPUT

Authored books

Ramutsindela, M.F., Spierenburg, M. and Wels, H. 2011. *Sponsoring Nature: Environmental Philanthropy for Conservation*. Abingdon, Oxon: Earthscan. 197pp. ISBN 978 1 84407 904 9.

Chapters in books

Eckardt, F. and Drake, N. 2011. Introducing the Namib Desert Playas. In M. Öztürk, B. Böer, H.-J. Barth, S.-W. Breckle, M. Clüsener-Godt and M.A. Khan (eds), *Sabkha Ecosystems Volume III: Africa and Southern Europe*, pp. 19-25. Dordrecht: Dordrecht: Springer Science & Business Media B.V. ISBN 978 90 481 9672 2.

Fig, D. 2011. Corrosion and externalities: The socio-economic impacts of acid mine drainage on the Witwatersrand. In J. Daniel, P. Naidoo, D. Pillay and R. Southall (eds), *New South African Review 2: New Paths, Old Compromises?* pp.300-320. Johannesburg: WITS University Press. ISBN 978 1 86814 541 6.

Hauck, M.B. 2011. Small-scale fisheries compliance: integrating social justice, legitimacy and deterrence. In R.S. Pomeroy and N.L. Andrew (eds), *Small-scale fisheries management: Frameworks and approaches for the developing world*, pp. 196-215. Wallingford: Cabi Publishing. ISBN 978 1 84593 607 5.

Heinrichs, D., Aggarwal, R., Barton, J., Bharucha, E., Butsch, C., Fragkias, M., Johnston, P.A., Kraas, F., Krellenberg, K., Lampis, A., Ooi, G.L. and Vogel, J. 2011. Adapting cities to climate change: opportunities and constraints. In D. Hoornweg, M. Freire, M.J. Lee, P. Bhada-Tata and B. Yuen (eds), *Cities and Climate Change: Responding to an Urgent Agenda*, pp. 193-224. Washington, D.C.: The World Bank. ISBN 978 0 8213 8493 0.

Laird, S., Wynberg, R.P. and McLain, R.J. 2011. Regulating complexity: policies for the governance of non-timber forest products. In S. Shackleton, C. Shackleton and P. Shanley (eds), *Non-Timber Forest Products in the Global Context*, pp. 227-253. Heidelberg: Springer Heidelberg Dordrecht. ISBN 978 3 642 17982 2.

Ramutsindela, M.F. 2011. Transfrontier conservation and the spaces of regionalisms. In T.M. Shaw, J.A. Grant and S. Cornelissen (eds), *The Ashgate Research Companion to Regionalisms*, pp. 361-373. Surrey, England: Ashgate Publishing. ISBN 978 0 7546 7762 8.

Robinson, J. and Parnell, S. 2011. Traveling theory: embracing post-neoliberalism through southern cities. In G. Bridge and S. Watson (eds), *The New Blackwell*

Companion to the City, pp. 521-531. Revised edition of: A Companion to the City, 2000. United Kingdom: Blackwell Publishing LTD. ISBN 978 1 4051 8981 1.

Wood, W.W., Eckardt, F., Kraemer, T.F. and Eng, K. 2011. Quantitative eolian transport of evaporite salts from the Makgadikgadi depression (Ntswetwe and Sua Pans) in northeastern Botswana: implications for regional ground-water quality. M. Öztürk, B. Böer, H.-J. Barth, S.-W. Breckle, M. Clüsener-Godt and M.A. Khan (eds), *Sabkha Ecosystems Volume III: Africa and Southern Europe*, pp. 27-37. Dordrecht: Dordrecht: Springer Science & Business Media B.V. ISBN 978 90 481 9672 2.

Articles in Peer-reviewed Journals

Abiodun, B.J., Gutowski, W., Abatan, A.A. and Prusa, J.M. 2011. CAM-EULAG: A non-hydrostatic atmospheric climate model with grid stretching. *Acta Geophysica*, 59(6): 1158-1167.

Atkinson, O.A.C., Thomas, D.S.G., Goudie, A.S. and Bailey, R. 2011. Late quaternary chronology of major dune ridge development in the northeast Rub'al-Khali, United Arab Emirates. *Quaternary Research*, 76: 93-105.

Brit-Gbaffou, C. and Oldfield, S.E. 2011. Accessing the state: everyday practices and politics in cities of the south. *Journal of Asian and African Studies*, 46(5): 445-452.

Battersby-Lennard, J.E. 2011. Urban food insecurity in Cape Town, South Africa: an alternative approach to food access. *Development Southern Africa*, 28(4): 545-561.

Boardman, J. and Foster, I.D.L. 2011. The potential significance of the breaching of small farm dams in the Sneeuberg region, South Africa. *Journal of Soils and Sediments*, 11: 1456-1465.

Borras, S.M., Fig, D. and Suarez, S.M. 2011. The politics of agrofuels and mega-land and water deals: insights from the ProCana case, Mozambique. *Review of African Political Economy*, 38(128): 215-234.

Cerezo-Mota, R., Allen, M.R. and Jones, R. 2011. Mechanisms controlling precipitation in the northern portion of the North American monsoon. *Journal of Climate*, 24(11): 2771-2783.

Chase, B.M., Quick, L., Meadows, M.E., Scott, L., Thomas, D. and Reimer, P.J. 2011. Late glacial interhemispheric climate dynamics revealed in South African hyrax middens. *Geology*, 39(1): 19-22.

Crespo, O., Bergez, J.E. and Garcia, F. 2011. P2q hierarchical decomposition algorithm for quantile optimization: application to irrigation strategies design. *Annals of Operations Research*, 190(1): 375-387.

Crespo, O., Bergez, J.E. and Garcia, F. 2011. P2 hierarchical decomposition procedure: application to irrigation strategies design. *Operational Research*, 11: 19-39

Crespo, O., Hachigonta, S. and Tadross, M.A. 2011. Sensitivity of Southern African maize yields to the definition of sowing dekad in a changing climate. *Climatic Change*, 106: 267-283.

Crush, J., Hovorka, A. and Tevera, D. 2011. Food security in Southern African cities: the place of urban agriculture. *Progress in development studies*, 11(4): 285-305.

Crush, J. and Frayne, G.B. 2011. Supermarket expansion and the informal food economy in Southern African cities: implications for urban food security. *Journal of Southern African Studies*, 37(4): 781-807.

Crush, J., Drimie, S., Frayne, G.B. and Caesar, M. 2011. The HIV and urban food security nexus in Africa. *Food Security*, 3: 347-362.

Crush, J. and Frayne, G.B. 2011. Urban food insecurity and the new international food security agenda. *Development Southern Africa*, 28(4): 527-544.

Cullis, J., Strzepek, K., Tadross, M.A., Sami, K., Havenga, B., Gildenhuys, B. and Smith, J. 2011. Incorporating climate change into water resources planning for the town of Polokwane, South Africa. *Climatic Change*, 108: 437-456.

Daya, S. 2011. Performing place, mobility and identity in South Africa. *Area*, 43(4): 488-494.

Fasona, M., Tadross, M.A., Abiodun, B.J. and Omojola, A. 2011. Local climate forcing and eco-climatic complexes in the wooded savannah of Western Nigeria. *Natural Resources*, 2: 155-166

Finch, J. and Marchant, R. 2011. A palaeoecological investigation into the role of fire and human activity in the development of montane grasslands in East Africa. *Vegetation History and Archaeobotany*, 20: 109-124.

Fung, F., Lopez, A. and New, M. 2011. Water availability in +2 degrees C and +4 degrees C worlds. *Philos Trans R Soc A-Math Phys Eng Sci*, 369(1934): 99-116.

Gbobaniyi, E.O., Abiodun, B.J., Tadross, M.A., Hewitson, B.C. and Gutowski, W. 2011. The coupling of cloud base height and surface fluxes: A transferability intercomparison. *Theoretical and Applied Climatology*, 106: 189-210.

Gezelius, S.S. and Hauck, M.B. 2011. Toward a theory of compliance in state-regulated livelihoods: A comparative study of compliance motivations in developed and

- developing world fisheries. *Law & Society Review*, 45(2): 435-470.
- Gibson, L.A., Mnch, Z. and Engelbrecht, J. 2011. Particular uncertainties encountered in using a pre-packaged SEBS model to derive evapotranspiration in a heterogeneous study area in South Africa. *Hydrology and Earth System Sciences*, 15: 295-310.
- Hamann, R., Giamporcaro, S., Johnston, D. and Yachkaschi, S. 2011. The role of business and cross-sector collaboration in addressing the "wicked problem" of food insecurity. *Development Southern Africa*, 28(4): 579-594.
- Kay, A.L., Crooks, S.M., Pall, P. and Stone, D.A. 2011. Attribution of Autumn/Winter 2000 flood risk in England to anthropogenic climate change: A catchment-based study. *Journal of Hydrology*, 406: 97-112.
- Lemon, A. and Battersby-Lennard, J.E. 2011. Studying together, living apart: emerging geographies of school attendance in post-apartheid Cape Town. *African Affairs*, 110(438): 97-120.
- Nathan, L. 2011. Interests, ideas and ideology: South Africa's policy on Darfur. *African Affairs*, 110(438): 55-74.
- New, M., Liverman, D., Schroder, H. and Anderson, K. 2011. Four degrees and beyond: the potential for a global temperature increase of four degrees and its implications. *Philosophical Transactions of the Royal Society A – Mathematical, Physical and Engineering Sciences*, 369(1934): 6-19.
- Oguntunde, P.G., Abiodun, B.J. and Lischeid, G. 2011. Rainfall trends in Nigeria, 1901-2000. *Journal of Hydrology*, 411: 207-218.
- Okosun, K.O., Ouifki, R. and Marcus, N. 2011. Optimal control analysis of a malaria disease transmission model that includes treatment and vaccination with waning immunity. *Biosystems*, 106: 136-145.
- Parnell, S. and Walawege, R.P. 2011. Sub-Saharan African urbanisation and global environmental change. *Global Environmental Change-Human and Policy Dimensions*, 21S: S12-S20.
- Quick, L., Chase, B.M., Meadows, M.E., Scott, L. and Reimer, P.J. 2011. A 19.5 kyr vegetation history from the central Cederberg Mountains, South Africa: Palynological evidence from rock hyrax middens. *Palaeogeography Palaeoclimatology Palaeoecology*, 309: 253-270.
- Quinn, C.H., Ziervogel, G., Taylor, A., Takama, T. and Thomalla, F. 2011. Coping with multiple stresses in Rural South Africa. *Ecology and Society*, 16(3): ES-04216-160302 (20 pp).
- Ramutsindela, M.F. 2011. Southern Africa: The geopolitical configuration of a lived region. *Political Geography*, 30: 294-297.
- Shackleton, C., Scholes, R., Vogel, C., Wynberg, R.P., Abrahamse, T., Shackleton, S., Ellery, F. and Gambiza, J. 2011. The next decade of environmental science in South Africa: a horizon scan. *South African Geographical Journal*, 93(1): 1-14.
- Sowman, M., Hauck, M., Van Sittert, L. and Sunde, J. 2011. Marine protected area management in South Africa: new policies, old paradigms. *Environmental Management*, 47: 573-583.
- Sowman, M. 2011. New perspectives in small-scale fisheries management: challenges and prospects for implementation in South Africa. *African Journal of Marine Science*, 33(2): 297-311.
- Thorn, J. and Oldfield, S.E. 2011. A politics of land occupation: state practice and everyday mobilization in Zille Raine Heights, Cape Town. *Journal of Asian and African Studies*, 46(5): 518-530.
- Wagsaether, K. and Ziervogel, G. 2011. Bridging the communication gap: an exploration of the climate science-water management interface. *Environment*, 53(3): 32-43.
- Willis, K.J., Feurdean, A., Birks, H.J.B., Bjune, A.E. Breman, E., Broekman, R., Grytnes, J.-A., New, M., Singarayer, J.S. and Rozema, J. 2011. Quantification of UV-B flux through time using UV-B-absorbing compounds contained in fossil *Pinus* sporopollenin. *New Phytologist*, 192: 553-560.
- Ziervogel, G. and Ericksen, P.J. 2010. Adapting to climate change to sustain food security. *Wiley Interdisciplinary Reviews-Climate Change*, 1(4): 525-540.

Peer-reviewed published conference proceedings

- Hart, N., Reason, C.J.C., Fauchereau, N. and Tadross, M.A. 2011. How does ENSO modify synoptic rainfall during summer? In S. Venkataraman (ed.), 27th Annual SASAS Conference Proceeding 2011. Interdependent Atmosphere, Land and Ocean, 22-23 September 2011, Pretoria. Pretoria: South African Society for Atmospheric Sciences (SASAS). ISBN 9780620508490.

DEPARTMENT OF GEOLOGICAL SCIENCES

HEAD OF DEPARTMENT: ASSOCIATE PROFESSOR
STEPHEN RICHARDSON

DEPARTMENTAL PROFILE

Research in the Department of Geological Sciences covers a wide range of disciplines. The Department has strengths in geochemistry, structural geology and tectonics, igneous and metamorphic petrology, sedimentology, marine geology, economic geology and petroleum geophysics. General research interests include: global tectonics and geodynamics with emphasis on Gondwana geology; oceanic and continental igneous processes and the geochemical evolution of the underlying mantle; kimberlites and the genesis of diamonds; evolution of the Kaapvaal craton and gold genesis; paleoenvironments; marine geoscience and sedimentary geochemistry. Analytical facilities include X-ray fluorescence, X-ray diffraction, electron microprobe, ion chromatography, fluid inclusion stage, stable isotope extraction lines and access to a stable isotope mass spectrometer, sedigraph for particle size analysis, inductively coupled plasma mass spectrometer (solution and laser analysis), and solid source thermal ionization mass spectrometer and associated clean laboratories.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professors	2
Associate Professors	3
Senior Lecturers	2
Lecturers	2
Technical Support Staff	12
Administrative & Clerical Staff	3
Total	24

Honorary staff

Honorary Research Associates	2
------------------------------	---

Students

Postdoctoral	1
Doctoral	11
Master's	17
Honours	16
Undergraduate	588
Total	633

RESEARCH FIELDS AND STAFF

Permanent staff

ASSOCIATE PROFESSOR STEPHEN RICHARDSON

Head of Department; Isotope geochemistry; geochronology; diamonds; continental mantle evolution.

PROFESSOR ANTON LE ROEX

Dean of Science; Igneous geochemistry; analytical geochemistry; mantle evolution.

PROFESSOR CHRIS HARRIS

Stable isotope geochemistry; igneous petrology.

ASSOCIATE PROFESSOR JOHN COMPTON

Low-temperature and sedimentary geochemistry; marine geology.

ASSOCIATE PROFESSOR DAVID REID

Precambrian crustal evolution and metallogeny; carbonatites; isotope geochemistry.

MR GEORGE SMITH

Senior Lecturer; petroleum geophysics.

DR EMESE BORDY

Senior Lecturer: Sedimentology

DR JOHANN DIENER

Lecturer; Metamorphic petrology.

DR AKE FAGERENG

Lecturer; Structural geology.

Honorary Research Associates

PROFESSOR HARTWIG FRIMMEL

Metamorphic petrology.

DR ROGER SMITH

Palaeontology.

CONTACT DETAILS

Postal address: Department of Geological Sciences,
University of Cape Town, Private Bag X3, Rondebosch,
7701

Telephone: +27 21 650 2931

Fax: +27 21 650 3783

E-mail: sci-geology@uct.ac.za

E-mail: <http://web.uct.ac.za/depts/geolsci/>

UCT General enquiries: +27 21 650 9111

UCT web: <http://www.uct.ac.za>

RESEARCH OUTPUT

Edited books

Fagereng, A., Toy, V.G. and Rowland, J.V. (eds) 2011. *Geology of the Earthquake Source: A Volume in Honour of Rick Sibson*. 331pp. Geological Society Publishing House: The Geological Society London. ISBN 978-1-86239-337-0.

Chapters in books

Fagereng, A. and Toy, V.G. 2011. *Geology of the earthquake source: an introduction*. In A. Fagereng, V.G. Toy and J.V. Rowland (eds), *Geology of the Earthquake Source: A Volume in Honour of Rick Sibson*, pp. 1-16. Geological Society Publishing House: The Geological Society London. ISBN 978-1-86239-337-0.

Fagereng, A. 2011. *Geology of the seismogenic subduction thrust interface*. In A. Fagereng, V.G. Toy and J.V. Rowland (eds), *Geology of the Earthquake Source: A Volume in Honour of Rick Sibson*, pp. 55-76. Geological Society Publishing House: The Geological Society London. ISBN 978-1-86239-337-0.

Rowe, C.D., Meneghini, F. and Moore, J.C. 2011. *Textural record of the seismic cycle: strain-rate variation in an ancient subduction thrust*. In A. Fagereng, V.G. Toy and J.V. Rowland (eds), *Geology of the Earthquake Source: A Volume in Honour of Rick Sibson*, pp. 77-95. Geological Society Publishing House: The Geological Society London. ISBN 978-1-86239-337-0.

Articles in Peer-reviewed Journals

Abanda, P.A., Compton, J.S. and Hannigan, R. 2011. *Soil nutrient content, above-ground biomass and litter in a semi-arid shrubland, South Africa*. *Geoderma*, 164(3-4): 128-137.

Abraham, K.A., Hofmann, A.H., Foley, S.F., Cardinal, D., Harris, C., Barth, M.G. and Andre, L. 2011. *Coupled silicon-oxygen isotope fractionation traces Archean silicification*. *Earth and Planetary Science Letters*, 301(1-2): 222-230.

Backeberg, N., Reid, D.L., Trumbull, R. and Romer, R.L. 2011. *Petrogenesis of the False Bay dyke swarm, Cape Peninsula, South Africa: Evidence for basement assimilation*. *South African Journal of Geology*, 114: 335-352.

Biggin, A.J., de Wit, M.J., Langereis, C., Zegers, T.E., Voute, S., Dekkers, M.J. and Drost, K. 2011. *Palaeomagnetism of Archaean rocks of the Onverwacht Group, Barberton Greenstone Belt (southern Africa): evidence for a stable and potentially reversing geomagnetic field at ca. 3.5 Ga*. *Earth and Planetary Science Letters*, 302: 314-328.

Botha-Brink, J. and Smith, R.M.H. 2011. *Osteohistology of the Triassic archosauromorphs Prolacerta, Proterosuchus, Euparkeria, and Erythrosuchus from the Karoo Basin of South Africa*. *Journal of Vertebrate Paleontology*, 31(6): 1238-1254

Bourquin, S., Bercovici, A., Lopez-Gomez, J., Diez, J.B., Broutin, J., Ronchi, A., Durand, M., Arche, A., Linol, B. and Amour, F. 2011. *The Permian-Triassic transition and the onset of Mesozoic sedimentation at the northwestern peri-Tethyan domain scale: Palaeogeographic maps and geodynamic implications*. *Palaeogeography Palaeoclimatology Palaeoecology*, 299: 265-280.

Boyd, D., Anka, Z., Primio, R.D., Kuhlmann, G. and De Wit, M. 2011. *Passive Margin evolution and control on natural gas leakage in the Orange Basin, South Africa*. *South African Journal of Geology*, 114: 415-432.

Class, C. and Le Roex, A.P. 2011. *South Atlantic DUPAL anomaly - dynamic and compositional evidence against a recent shallow origin*. *Earth and Planetary Science Letters*, 305: 92-102.

Compton, J.S. 2011. *Pleistocene sea-level fluctuations and human evolution on the southern coastal plain of South Africa*. *Quaternary Science Reviews*, 30(5-6): 506-527.

Copeland, S.R., Sponheimer, M., de Ruiter, D., Lee-Thorp, J.A., Codron, D.C., Le Roux, P., Grimes, V. and Richards, M.P. 2011. *Strontium isotope evidence for landscape use by early hominins*. *Nature*, 474: 76-78.

Cotterill, F. and De Wit, M. 2011. *Geocodynamics and the Kalahari epeirogeny: linking its genomic record, tree of life and palimpsest into a unified narrative of landscape evolution*. *South African Journal of Geology*, 114: 489-514.

Curtis, C., Trumbull, R., De Beer, C.H., Harris, C., Reid, D.L. and Romer, R.L. 2011. *Geochemistry of the early Cretaceous Koegel Fontein anorogenic igneous complex, South Africa*. *South African Journal of Geology*, 114: 353-378.

de Wit, M.J., Furnes, H. and Robins, B. 2011. *Geology and tectonostratigraphy of the Onverwacht Suite, Barberton Greenstone Belt*. *Precambrian Research*, 186: 1-27.

Decker, J., Niedermann, S. and De Wit, M. 2011. *Soil erosion rates in South Africa compared with cosmogenic ³He-based rates of soil production*. *South African Journal of Geology*, 114: 475-488.

Fagereng, A. 2011. *Fractal vein distribution within a fault-fracture mesh in an exhumed accretionary mélangé, Chrystalls Beach Complex, New Zealand*. *Journal of Structural Geology*, 33(5): 918-927.

- Fagereng, A. 2011. Frequency-size distribution of competent lenses in a block-in-matrix melange: Imposed length scales of brittle deformation? *Journal of Geophysical Research-Solid Earth*, 116: 12.
- Fagereng, A., Remitti, F.R. and Sibson, R.H.S. 2011. Incrementally developed slickenfibres - Geological record of repeating low stress-drop seismic events? *Tectonophysics*, 520: 381-386.
- Fagereng, A. and Diener, J.F.A. 2011. Non-volcanic tremor and discontinuous slab dehydration. *Geophysical Research Letters*, 38: 1-5.
- Fagereng, A. and Diener, J.F.A. 2011. San Andreas Fault tremor and retrograde metamorphism. *Geophysical Research Letters*, 38: 1-6.
- Fagereng, A. 2011. Wedge geometry, mechanical strength, and interseismic coupling of the Hikurangi subduction thrust, New Zealand. *Tectonophysics*, 507: 26-30.
- Faulkes, C.G., Bennett, N., Cotterill, F., Stanley, W., Mgone, G.F. and Verheyen, E. 2011. Phylogeography and cryptic diversity of the solitary-dwelling silvery mole-rat. *Journal of Zoology*, 295: 324-338.
- Fourie, D.S. and Harris, C. 2011. O-isotope study of the Bushveld Complex Granites and Granophyres: constraints on source composition, and assimilation. *Journal of Petrology*, 52(11): 2221-2242.
- Frimmel, H.E. 2011. The Chameis Gate Member, Chameis Group, Marmora Terrane, Namibia. *Geological Society London: Memoirs*, 36: 217-221.
- Frimmel, H.E. 2011. The Kaigas and Numees Formation, Port Nolloth, in South Africa and Namibia. *Geological Society London: Memoirs*, 36: 223-231.
- Frimmel, H.E. 2011. The Karoetjies Kop and Bloupoort formations, Gifberg Group, South Africa. *Geological Society London: Memoirs*, 36: 233-237.
- Frimmel, H.E., Basei, M. and Gaucher, C. 2011. Neoproterozoic geodynamic evolution of SW-Gondwana: a southern African perspective. *International Journal of Earth Sciences*, 100: 323-354.
- Furnes, H., de Wit, M.J., Robins, B. and Sandsta, N.R. 2011. Volcanic evolution of the upper Onverwacht Suite, Barberton Greenstone Belt, South Africa. *Precambrian Research*, 186: 28-50.
- Gilder, S.A., Egli, R., Hochleitner, R., Roud, S.C., Volk, M.W.R., Le Goff, M. and de Wit, M.J. 2011. Anatomy of a pressure-induced, ferromagnetic-to-paramagnetic transition in pyrrhotite: Implications for the formation pressure of diamonds. *Journal of Geophysical Research-Solid Earth*, 116(B10101): 1-15.
- Goodier, S., Cotterill, F., O'Ryan, C., Skelton, P.H. and de Wit, M.J. 2011. Cryptic diversity of African Tigerfish (Genus *Hydrocynus*) reveals palaeogeographic signatures of linked Neogene Geotectonic Events. *PLoS One*, 6(12): e28775. 15pp.
- Grosch, E., Kosler, J., McLoughlin, N., Drost, K., Slama, J. and Pedersen, R.B. 2011. Paleoproterozoic detrital zircon ages from the earliest tectonic basin in the Barberton Greenstone Belt, Kaapvaal craton, South Africa. *Precambrian Research*, 191: 85-99.
- Koglin, N., Frimmel, H.E., Minter, L. and Bratz, H. 2011. Reply to Reimer and Mossman. Comment on "Trace-element characteristics of different pyrite types in mesoarchaean to palaeoproterozoic placer deposits" by Koglin et al. *Mineralium Deposita*, 46: 839-840.
- Mauger, C. and Compton, J.S. 2011. Formation of modern dolomite in hypersaline pans of the Western Cape, South Africa. *Sedimentology*, 58(7): 1678-1692.
- Melluso, L.M., Le Roex, A.P. and Morra, V.M. 2011. Petrogenesis and Nd-, Pb-, Sr-isotope geochemistry of the Cenozoic olivine melilitites and olivine nephelinites (ankaratrites) in Madagascar. *Lithos*, 127: 505-521.
- Moore, A. and Cotterill, F. 2011. The Acacia retypification debate: perspectives of African amateur botanists. *Taxon*, 60(3): 858-859.
- Muller, J.M. and Frimmel, H.E. 2011. Abscissa transforming second-order polynomial functions to approximate the unknown historic production of non-renewable resources. *Mathematical Geosciences*, 43: 625-634.
- Reisberg, L.R., Tredoux, M.T., Harris, C., Coftier, A.C. and Chuamba, J. 2011. Re and Os distribution and Os isotope composition of the Platreef at the Sandsloot-Mogalakwena mine, Bushveld complex, South Africa. *Chemical Geology*, 281: 352-363.
- Rigby, M.J., Basson, I.J., Kramers, J.D., Graser, P. and Mavimbela, P.K. 2011. The structural, metamorphic and temporal evolution of the country rocks surrounding Venetia Mine, Limpopo Belt, South Africa: Evidence for a single palaeoproterozoic tectono-metamorphic event with implications for a tectonic model. *Precambrian Research*, 186: 51-69.
- Robins, B., Sandsta, N.R., Furnes, H. and de Wit, M.J. 2011. Evidence for refilling of previously emptied basaltic pillows in the Hooggenoeg Complex, Barberton Greenstone Belt. *Geological Magazine*, 148(3): 435-441.

Rowe, C. and Backeberg, N. 2011. Discussion on: Reconstruction of the Ordovician Pakhuis ice sheet, South Africa by H.J. Blignault and J.N. Theron. *South African Journal of Geology*, 114: 95-102.

Sandsta, N.R., Robins, B., Furnes, H. and de Wit, M.J. 2011. The origin of large varioles in flow-banded pillow lava from the Hooggenoeg Complex, Barberton Greenstone Belt, South Africa. *Contributions to Mineralogy and Petrology*, 162: 365-377.

Shirey, S.B. and Richardson, S.H. 2011. Start of the Wilson Cycle at 3 Ga shown by diamonds from subcontinental mantle. *Science*, 333: 434-436.

Smith, R.M.H. and Botha-Brink, J. 2011. Morphology and composition of bone-bearing coprolites from the Late Permian Beaufort Group, Karoo Basin, South Africa. *Palaeogeography Palaeoclimatology Palaeoecology*, 312: 40-33.

Vogeli, J., Reid, D.L., Becker, M.E., Broadhurst, J.L. and Franzidis, J.-P. 2011. Investigation of the potential for mineral carbonation of PGM tailings in South Africa. *Minerals Engineering*, 24: 1348-1356.

Zhao, H.Z., Jiang, S.-Y. and Frimmel, H.E. 2011. A Rare Bi-Pb Tellurosulfide, $PbBi_4Te_4S_3$, from the wenyu gold deposit in the xiaoqinling gold province, China. *Canadian Mineralogist*, 49: 1297-1304.

Zhao, H.Z., Frimmel, H.E., Jiang, S.J. and Dai, B.D. 2011. LA-ICP-MS trace element analysis of pyrite from the Xiaoqinling gold district, China: Implications for ore genesis. *Ore Geology Reviews*, 43: 142-153.

DEPARTMENT OF MATHEMATICS AND APPLIED MATHEMATICS

(Including the Cosmology and Gravity Group, the Laboratory of Foundational Aspects of Computer Science (FACS-Lab), the Marine Resource Assessment and Management Group (MARAM), Industrial Mathematics, and the Topology Research Group)

HEAD OF DEPARTMENT: ASSOCIATE PROFESSOR VASCO BRATTKA

DEPARTMENTAL PROFILE

The Department of Mathematics and Applied Mathematics houses a number of research groups and individual activities which, in total, cover a large part of the mathematical spectrum. Examples are: cosmology and relativity, computational and applied mechanics, marine resource assessment and management, rangeland modelling, industrial mathematics, foundational aspects of computer science, topology, category theory, nonlinear mathematical physics, functional analysis, cryptography, string theory, financial mathematics and algebra. The Department has active research collaboration with other groups in the country and abroad. There is a strong postgraduate program, with M.Sc. and Ph.D. students in a variety of fields. A number of staff have NRF A-ratings and B-ratings. The Department has a good technical and administrative infrastructure, and regularly hosts visitors from abroad. More information can be found on the website www.mth.uct.ac.za.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professors	8
Associate Professors	5
Senior Lecturers	8
Lecturers (full-time)	15
Senior Scholar	1
Research Staff	3
Technical Support Staff	3
Administrative and Clerical Staff	11
Total	54

Honorary staff

Emeritus Professors	5
Emeritus Associate Professor	1
Visiting Professor and Principal research officer	1
Research Associate	2
Total	9

Students

Postdoctoral	11
Doctoral	30
Master	85
Honours	15
Undergraduate	6836
Total	6977

RESEARCH FIELDS AND STAFF

Permanent and long-term contract staff

PROFESSOR IGOR BARASHENKOV

Nonlinear waves and solitons; nonlinear dynamics; mathematical physics.

PROFESSOR BRUCE BASSETT

Observational and theoretical cosmology; nonlinear optimization. Research astronomer at the South African Astronomy Observatory and senior researcher, African Institute of Mathematical Sciences.

PROFESSOR DOUG BUTTERWORTH

Director, Marine Resource Assessment and Management Group (MARAM); particular focus on South African fisheries, northwest Atlantic fisheries, and southern bluefin tuna, Antarctic whale and krill resources.

PROFESSOR KATHY DRIVER

Special functions, orthogonal polynomials and approximation theory.

PROFESSOR PETER DUNSBY

Director of the National Astrophysics and Space Science Programme; Co-Director of the Astrophysics, Cosmology and Gravitation Centre; cosmological perturbations; cosmic microwave background anisotropies; gravitational lensing; inflationary cosmology; cosmological magnetic fields; on-line mathematics education.

PROFESSOR GEORGE JANELIDZE

Category theory; algebra; topology; sets and logic.

PROFESSOR HANS-PETER KÜNZI

Topology, orders, categories, combinatorics and their applications in analysis and algebra; particular focus being the theory of asymmetric topology; leader of topology and category theory research group

PROFESSOR DAYA REDDY

South African Research Chair in Computational Mechanics Director, UCT Centre for Research in Computational and Applied Mechanics (CERECAM); mathematical and computational aspects of continuum mechanics; the finite element method.

ASSOCIATE PROFESSOR VASCO BRATTKA

Computable analysis; effective descriptive set theory; algorithmic randomness.

ASSOCIATE PROFESSOR CHRISTOPHER GILMOUR

Pointfree topology and sigma-frames; categorical topology.

ASSOCIATE PROFESSOR CHARLES HELLABY

General relativity; cosmology; gravity.

ASSOCIATE PROFESSOR ALEXANDAR IANOVSKY

Dynamical systems – finite and infinite dimensions; differential geometric methods in the theory of dynamical systems.

ADJUNCT ASSOCIATE PROFESSOR GRAEME WEST

Mathematics of finance.

DR PETER BRUYNS

Senior Lecturer; group theory; permutation groups.

DR CHRISTOPHER CLARKSON

Senior Lecturer; cosmology; gravitational waves; non-linear perturbation theory; braneworlds -black holes; quasi-normal modes.

DR JURIE CONRADIE

Senior Lecturer; functional analysis; vector lattices; von Neumann algebras; non-commutative function spaces; mathematics education.

DR FRANCOISE EBOBISSE BILLE

Senior Lecturer, calculus of variations; PDE; mathematical and computational aspects of continuum mechanics; the finite element method.

DR JOHN FRITH

Senior Lecturer; frame theory; topos theory; categorical topology; mathematical education.

DR HENRI LAURIE

Senior Lecturer; mathematical biology, in particular ecology; industrial mathematics; mathematics education.

DR JEFF MURUGAN

Senior Lecturer; string theory, quantum gravity, neurophysics.

DR ANNELIESE SCHAUERTE

Senior Lecturer; frame and biframe theory; categorical topology; uniform and quasi-uniform structures.

DR NORA ALEXEEVA

Lecturer; nonlinear dynamics and solitons; pattern formation in reaction-diffusion systems; synchronization of chaotic systems.

DR MARGARET ARCHIBALD

Lecturer; analysis of algorithms and combinatorics.

DR MARK BERMAN

Lecturer; group theory; universal algebra; set theory and model theory.

DR TIRIVANHU CHINYOKA

Lecturer; computational fluid dynamics.

DR EBRAHIM FREDERICKS

Lecturer; lie symmetries analysis of stochastic differential equations; lie symmetries analysis of partial differential equations; lie symmetries analysis of ordinary differential equations; applying lie symmetries to fluid mechanics, applying lie symmetries to mathematics of finance.

DR ROBERT MARTIN

Lecturer, functional analysis; operator theory.

DR ANDRIY POTOTSKYY

Lecturer, rectification of brownian motion, directed transport of particles in molecular rectifiers; many body systems: non-equilibrium dynamical density functional theory; fluctuations and noise induced motion: stochastic differential equations, jump processes, collective phenomena in coupled stochastic networks; pattern formation in complex systems.

MR KENNETH RAFEL

Lecturer; mathematics education.

DR JESSE RATZKIN

Lecturer; geometric analysis.

DR NEILL ROBERTSON

Lecturer; functional analysis; locally convex spaces; descriptive set theory; infinite-dimensional holomorphy.

DR DEON SOLOMONS

Lecturer; thermodynamics of spacetime; Interference and diffraction phenomena in gravitational lensing; structure formation in the universe; theories of higher order gravity.

DR HOLGER SPAKOWSKI

Lecturer; theoretical computer science; computational complexity.

DR CHRISTINE SWART

Lecturer; cryptography, number theory, recurrence sequences.

DR VITALI VOUGALTER

Lecturer; nonlinear analysis; partial differential equations; mathematical biology.

DR AMANDA WELTMAN

Lecturer; string theory; cosmology; gravity.

Senior Scholar

EMERITUS DISTINGUISHED PROFESSOR GEORGE ELLIS

Distinguished Professor of complex systems; cosmology and general relativity theory; emergence and functioning of complex systems, including the human brain; science policy; mathematics and science education; metaphysics of cosmology and its connections to ethics and religion; social indicators.

Research staff

DR ANABELA BRANDÃO

Senior Research Officer, MARAM; Southern Ocean toothfish assessment; SA west coast rock lobster surveys; minke whales, SA abalone assessment.

DR CARRYN DE MOOR

Senior Research Officer, MARAM; S.A. sardine and anchovy assessment and management.

DR SUSAN HOLLOWAY

Senior Research Officer, MARAM; S.A. west and south coast rock lobster and horse mackerel assessment; whale management procedures.

DR KENNETH HUGHES

Honorary Research Associate; number theory; algebra; algebraic geometry; topological quantum field theory; p-adic analysis, nil-theta functions.

DR ÉVA PLAGÁNYI-LLOYD

Honorary Research Associate; multispecies modelling; fisheries assessment and management ecological modeling, S.A. abalone assessment.

Distinguished visitors

EMERITUS PROFESSOR BERNHARD BANASCHEWSKI

McMaster University, Hamilton, Ontario, Canada – pointfree topology; partially ordered algebraic systems; applied category theory.

PROFESSOR ROY MAARTENS

Director of Institute of Cosmology and Gravitation, University of Portsmouth, UK – Relativity, Cosmology, Gravity.

Honorary staff

EMERITUS PROFESSOR RONALD BECKER

Differential equations (bifurcations, abstract equations); theory of algorithms (graph partitioning, sorting networks) and Mathematical Finance.

EMERITUS PROFESSOR GUILLAUME BRÜMMER

Topology and category theory group; categorical topology; asymmetric topology and uniformity.

EMERITUS PROFESSOR KEITH HARDIE

Homotopy theory; algebraic topology; digital topology; categorical topology.

EMERITUS ASSOCIATE PROFESSOR RONALD CROSS

Functional analysis; unbounded linear operators; linear relations.

PROFESSOR PATRICIA WHITELOCK

Visiting Professor and Principal Research Officer; SAAO.

DR DAVID RICHARDSON

Research Associate; Rangeland Modelling Group; modelling grazing animal production systems; relations between complex and simple models.

PROFESSOR JOHN WEBB

Mathematics education.

Postdoctoral Fellows

DR DECHANG DAI

Cosmology.

DR ALVARO DE LA CRUZ

Cosmology.

DR RITUPARNO GOSWAMI

Cosmology.

DR OLAWANLE PATRICK LAYENI

CERECAM: Moving boundary problems and variational inequalities.

DR MAKSIM MOLCHAN

Nonlinear waves and solitons; nonlinear dynamics; mathematical physics.

DR PRINA PATEL

Cosmology.

DR PETJA SALMI

Numerical Studies of nonlinear dynamics in the early universe in particular on nontopological defects.

DR MARINA SEIKEL

Cosmology.

DR MATTHEW SMITH

Supernovae for cosmology.

DR PER ERIC SUNDIN

String theory and cosmology.

DR ROCKHEE SUNG

Cosmology.

CONTACT DETAILS

Postal address: Department of Mathematics & Applied Mathematics, University of Cape Town, Private Bag, Rondebosch, 7701

Telephone: SA (21) 650 3191

Fax: SA (21) 650 2334

E-mail: mam-admin@uct.ac.za

Web: <http://www.mth.uct.ac.za>

RESEARCH OUTPUT

Chapters in books

Chinyoka, T. 2011. Effects of fluid viscoelasticity in non-isothermal flows. In A. Ahsan (ed.), *Evaporation, Condensation and Heat Transfer*, pp. 423-438. Croatia: Intech. ISBN 978-953-307-583-9.

Ellis, G.F.R. 2011. "Why are the laws of nature as they are? What underlies their existence?" In D.G. York, O. Gingerich and S.-N. Zhang (eds), *The Astronomy Revolution: 400 Years of Exploring the Cosmos*, pp. 387-406. London: CRC Press Taylor & Francis. ISBN 9781439836002.

Ellis, G.F.R. 2011. Biology and mechanisms related to the dawn of language. In C.S. Henshilwood and F. d'Errico (eds), *Homo Symbolicus: The Dawn of Language, Imagination and Spirituality*, pp. 163-183. Netherlands: John Benjamins B V Publ. ISBN 978-90-272-11897.

Ellis, G.F.R. 2011. Fundamental issues and problems of cosmology. In J.-P. Lasota (ed.), *Astronomy at the Frontiers of Science*, pp. 309-320. New York: Springer Heidelberg Dordrecht. ISBN 978-94-007-1657-5.

Ellis, G.F.R. 2011. The big picture: exploring questions on the boundaries of science - mind, matter, mathematics. In R.Y. Chiao, M.L. Cohen, A.J. Leggett, W.D. Phillips and L. Charles (eds), *Visions of Discovery: New Light on Physics, Cosmology, and Consciousness*, pp. 645-661. New York: Cambridge University Press. ISBN 978-0-521-88239-2.

Ellis, G.F.R. 2011. The big picture: exploring questions on the boundaries of science-consciousness and free will. In R.Y. Chiao, M.L. Cohen, A.J. Leggett, W.D. Phillips and L. Charles (eds), *Visions of Discovery: New Light on Physics, Cosmology, and Consciousness*, pp. 545-557. New York: Cambridge University Press. ISBN 978-0-521-88239-2.

Richardson, F.D. and Hoffman, M.T. 2011. Using models to predict the probability of degradation of rangelands when subjected to different management strategies. In L. Zietsman (ed.), *Observations on Environmental Change in South Africa*, pp. 109-123. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Articles in Peer-reviewed Journals

- Alexeeva, N.V. and Zemlyanaya, E. 2011. Breathers in a damped-driven nonlinear Schroedinger equation. *Theoretical and Mathematical Physics*, 168(1): 858-864.
- Alvarez, T. and Wilcox, D.L. 2011. The baire property and the domain of iterates of a paracomplete linear relation. *Journal of Operator Theory*, 66(2): 451-464.
- Archibald, M.L. and Knopfmacher, A. 2011. The largest missing value in a composition of an integer. *Discrete Mathematics*, 311: 723-731.
- Banaschewski, B. and Gilmour, C.R. 2011. Rings of continuous functions on ω -frames. *Topology and its Applications*, 158: 861-868.
- Barashenkov, I.V. and Zemlyanaya, E. 2011. Soliton complexity in the damped-driven nonlinear Schrodinger equation: stationary to periodic to quasiperiodic complexes. *Physical Review E*, 83: 1-8. (056610).
- Barashenkov, I.V., Zemlyanaya, E. and van Heerden, T.C. 2011. Time-periodic solitons in a damped-driven nonlinear Schrodinger equation. *Physical Review E*, 83: 1-11. (056609).
- Barashenkov, I.V. and Zemlyanaya, E. 2011. Travelling solitons in the externally driven nonlinear Schrodinger equation. *Journal of Physics A: Mathematical and Theoretical*, 44: 465211. (23pp.)
- Bargmann, S. and Reddy, B.D. 2011. Modeling of polycrystals using a gradient crystal plasticity theory that includes dissipative micro-stresses. *European Journal of Mechanics A-Solids*, 30: 719-730.
- Bassett, B.A., Fantaye, Y., Hlozek, R. and Kotze, J. 2011. Fisher matrix preloaded - Fisher4Cast. *International Journal of Modern Physics D*, 20(13): 2559-2598.
- Bhattacharya, S., Goswami, R. and Joshi, P.S. 2011. Collapse and dispersal in massless scalar field models. *International Journal of Modern Physics D*, 20(6): 1123-1133.
- Beardon, A.F., Driver, K.A. and Jordaan, K. 2011. Zeros of polynomials embedded in an orthogonal sequence. *Numerical Algorithms*, 57: 399-403.
- Berman, M.N. 2011. Uniformity and functional equations for local zeta functions of \mathfrak{K} -split algebraic groups. *American Journal of Mathematics*, 133(1): 1-27.
- Bernardeau, F., Pitrou, C. and Uzan, J.P. 2011. CMB spectra and bispectra calculations: making the flat-sky approximation rigorous. *Journal of Cosmology and Astroparticle Physics*, 015: 1-32.
- Bolejko, K., Hellaby, C. and Alfedeeel, A. 2011. The metric of the cosmos from luminosity and age data. *Journal of Cosmology and Astroparticle Physics*, JCAP09(2011) 011, 1-25.
- Bradley, J., Dankelmann, P., Erwin, D. and Rodrigues, B.G. 2011. On the fixing number of graphs with abelian automorphism group. *Utilitas Mathematica*, 86: 71-78.
- Brattka, V. and Gherardi, G. 2011. Effective choice and boundedness principles in computable analysis. *Bulletin of Symbolic Logic*, 17(1): 73-117.
- Brattka, V. and Gherardi, G. 2011. Weihrauch degrees, omniscience principles and weak computability. *Journal of Symbolic Logic*, 76(1): 143-176.
- Brax, P., Burrage, C., Davis, A., Seery, D. and Weltman, A. 2011. Anomalous coupling of scalars to gauge fields. *Physics Letters B*, 699: 5-9.
- Brummer, G.C.L., Kunzi, H. and Sioen, M. 2011. Concrete functors determined by their restrictions to the T o objects. *Topology and its Applications*, 158: 2382-2390.
- Brummer, G.C.L., Kunzi, H. and Sioen, M. 2011. More on upper bicompletion-true functorial quasi-uniformities. *Topology and its Applications*, 158: 1937-1941.
- Bruyns, P.V. 2011. A new species of *Sarcostemma* (Apocynaceae-Asclepiadoideae-Asclepiadeae) from Yemen. *South African Journal of Botany*, 77: 801-804.
- Bruyns, P.V., Klak, C. and Hanacek, P. 2011. Age and diversity in Old World succulent species of *Euphorbia* (Euphorbiaceae). *Taxon*, 60: 1717-1733.
- Carroll, T. and Ratzkin, J. 2011. Interpolating between torsional rigidity and principal frequency. *Journal of Mathematical Analysis and Applications*, 379: 818-826.
- Chinyoka, T. and Makinde, O.D. 2011. Analysis of transient generalized couette flow of a reactive variable viscosity third-grade liquid with asymmetric convective cooling. *Mathematical and Computer Modelling*, 54: 160-174.
- Chinyoka, T. and Makinde, O.D. 2011. On transient flow of a reactive variable viscosity third-grade fluid through a cylindrical pipe with convective cooling. *Meccanica*, 47: 667-685.
- Chinyoka, T. 2011. Suction-injection control of shear banding in non-isothermal and exothermic channel flow of Johnson-Segalman liquids. *Journal of Fluids Engineering-Transactions of the ASME*, 133: 071205-1-12.
- Chinyoka, T. 2011. Two-dimensional flow of chemically reactive viscoelastic fluids with or without the influence of

- thermal convection. *Communications in Nonlinear Science and Numerical Simulation*, 16: 1387-1395.
- Chinyoka, T. and Makinde, O.D. 2011. Unsteady hydromagnetic flow of a reactive variable viscosity third-grade fluid in a channel with convective cooling. *International Journal for Numerical Methods in Fluids*, 1-13.
- Clarkson, C.A., Ellis, G.F.R., Larena, J. and Umeh, O.C. 2011. Does the growth of structure affect our dynamical models of the universe? The averaging, backreaction, and fitting problems in cosmology. *Reports on Progress in Physics*, 74: 112901. (17pp).
- Clarkson, C.A. and Umeh, O.C. 2011. Is backreaction really small within concordance cosmology? *Classical and Quantum Gravity*, 28: 1-23. (164010).
- Clarkson, C.A. and Osano, O. 2011. Locally extracting scalar, vector and tensor modes in cosmological perturbation theory. *Classical and Quantum Gravity*, 28: 1-15. (225002).
- Clarkson, C.A. and Regis, M. 2011. The cosmic microwave background in an inhomogeneous universe. *Journal of Cosmology and Astroparticle Physics*, 2: 1-39.
- Clementino, M.M. and Janelidze, G. 2011. A note on effective descent morphisms of topological spaces and relational algebras. *Topology and its Applications*, 158(17): 2431-2436.
- Cross, R., Favini, A. and Yakubov, Y. 2011. Perturbation results for multivalued linear operators. *NODEA-Nonlinear Differential Equations and Applications*, 80: 111-130.
- Czinner, V.i.k.t.o.r. 2011. A topologically flat thick 2-brane on higher dimensional black hole backgrounds. *Physical Review D*, 83: 064026. (9pp).
- Dai, D., Kinney, W.H. and Stojkovic, D. 2011. Measuring the cosmological bulk flow using the peculiar velocities of supernovae. *Journal of Cosmology and Astroparticle Physics*, 015: 1-8.
- D'Andrea, C.B., Gupta, R., Sako, M., Morris, M., Nichol, R.C., Brown, P.J., Campbell, H., Olmstead, M.D., Frieman, J., Garnavich, P., Jha, S.W., Kessler, R., Lampeitl, H., Marriner, J., Schneider, D. and Smith, M. 2011. Spectroscopic properties of star-forming host galaxies and type Ia supernova Hubble residuals in a nearly unbiased sample. *Astrophysical Journal*, 743(172): 1-12.
- Davis, T.M., Hui, L., Frieman, J., Haugbolle, T., Kessler, R., Sinclair, B., Sollerman, J., Bassett, B.A., Marriner, J., Morstell, E., Nichol, R.C., Richmond, M., Sako, M., Schneider, D. and Smith, M. 2011. The effect of peculiar velocities on supernova cosmology. *Astrophysical Journal*, 741(67): 1-15.
- De Jager, E.P. and Kunzi, H. 2011. More about complements of quasi-uniformities. *Topology and its Applications*, 158: 2287-2293.
- De Jager, E.P. and Kunzi, H. 2011. Permutable pairs of quasi-uniformities. *Topology and its Applications*, 158: 930-938.
- De Moor, C.L., Butterworth, D.S. and De Oliveira, J.A.A. 2011. Is the management procedure approach equipped to handle short-lived pelagic species with their boom and bust dynamics? The case of the South African fishery for sardine and anchovy. *ICES Journal of Marine Science*, 68(10): 2075-2085.
- Dominici, D.E., Driver, K.A. and Jordaan, K. 2011. Polynomial solutions of differential-difference equations. *Journal of Approximation Theory*, 163: 41-48.
- Driver, K.A., Jooste, A. and Jordaan, K. 2011. Stieltjes interlacing of zeros of Jacobi polynomials from different sequences. *Electronic Transactions on Numerical Analysis*, 38: 317-326.
- Driver, K.A. and Jordaan, K. 2011. Stieltjes interlacing of zeros of Laguerre polynomials from different sequences. *Indagationes Mathematicae-New Series*, 21: 204-211.
- Edwards, C.T.T. and Plaganyi-Lloyd, E.E. 2011. Protecting old fish through spatial management: is there a benefit for sustainable exploitation? *Journal of Applied Ecology*, 48: 853-863.
- Ellis, G.F.R. 2011. A life in space-time. *Nature*, 479(7373): 296.
- Ellis, G.F.R. 2011. Cosmology: Does the multiverse really exist? *Scientific American*, 305: 38-43.
- Ellis, G.F.R. 2011. Cosmology: The untestable multiverse. *Nature*, 469: 294-295.
- Ellis, G.F.R. 2011. Editorial note to: Jerome Kristian and Rainer K. Sachs, observations in cosmology. *General Relativity and Gravitation*, 43: 331-336.
- Ellis, G.F.R. 2011. Editorial note to: Brandon Carter, Large number coincidences and the anthropic principle in cosmology. *General Relativity and Gravitation*, 43: 3213-3223.
- Ellis, G.F.R. 2011. Inhomogeneity effects in cosmology. *Classical and Quantum Gravity*, 28: 164001. (21pp).
- Ellis, G.F.R., van Elst, H., Murugan, J. and Uzan, J.P. 2011. On the trace-free Einstein equations as a viable alternative to general relativity. *Classical and Quantum Gravity*, 28: 225007. (11pp).

- Ellis, G.F.R. 2011. Shear free solutions in general relativity theory. *General Relativity and Gravitation*, 43: 3253-3268.
- Ellis, G.F.R. 2011. Top-down causation and emergence: some comments on mechanisms. *Journal of the Royal Society Interface*: rfs20110062.
- Ellis, G.F.R. and Bloch, C.S. 2011. Top-down causation, adaptive selection, and their consequences. *Human Development*, 54: 93-100.
- Fourie, M.M., Rauch, L., Morgan, B.E., Ellis, G.F.R., Jordaan, E. and Thomas, K. 2011. Guilt and pride are heartfelt, but not equally so. *Psychophysiology*, 48(7): 888-899.
- Frith, J.L. and Schauerte, A. 2011. An asymmetric characterization of the congruence frame. *Topology and its Applications*, 158: 939-944.
- Frith, J.L. and Schauerte, A. 2011. The reals as full and balanced biframe. *Topology and its Applications*, 158: 2322-2331.
- Giovannoni, D., Murugan, J. and Prinsloo, A. 2011. The giant graviton on AdS₄ x CP³ -Another step towards the emergence of geometry. *Journal of High Energy Physics*, 003: 1-46.
- Goswami, R. and Ellis, G.F.R. 2011. Almost Birkhoff theorem in general relativity. *General Relativity and Gravitation*, 43: 2157-2170.
- Gupta, R., D'Andrea, C.B., Sako, M., Conroy, C., Smith, M., Bassett, B.A., Frieman, J., Garnavich, P.M., Jha, S., Kessler, R., Lampeitl, H., Marriner, J., Nichol, R.C. and Schneider, D. 2011. Improved constraints on type Ia supernova host galaxy properties using multi-wavelength photometry and their correlations with supernova properties. *Astrophysical Journal*, 740(92): 1-12.
- Hardie, K.A., Kamps, n. and Witbooi, P.J. 2011. A Coherent homotopy category of 2-track commutative cubes. *Applied Categorical Structures*, 19: 39-60.
- Herrero, R., Barashenkov, I.V., Alexeeva, N.V. and Staliunas, K. 2011. Anisotropic subdiffractive solitons. *Chaos Solitons & Fractals*, 44: 1070-1074.
- Janelidze, G. and Sobral, M. 2011. Descent for regular epimorphisms in Barr exact Goursat categories. *Applied Categorical Structures*, 19(1): 271-276.
- Janelidze, T. 2010. Snake Lemma in incomplete relative homological categories. *Theory and Applications of Categories*, 23(4): 76-91.
- Janelidze, T. 2011. Incomplete relative semi-abelian categories. *Applied Categorical Structures*, 19: 257-270.
- Kofman, L., Uzan, J.P. and Pitrou, C. 2011. Perturbations of generic Kasner spacetimes and their stability. *Journal of Cosmology and Astroparticle Physics*, 011: 1-30.
- Lari, I., Ricca, F., Scozzari, A. and Becker, R. 2011. Locating median paths on connected outerplanar graphs. *Networks*, 57(3): 294-307.
- Laurie, H.D.G. and Perrier, E. 2011. Beyond species area curves: application of a scale-free measure for spatial variability of species richness. *Oikos*, 120: 966-978.
- Layeni, O.P. and Adegoke, A.M. 2011. A novel revision of Goodman's profile and its application to a one-phase Stefan problem. *Mechanics Research Communications*, 38: 456-462.
- Leloudas, G., Gallazzi, A., Sollerman, J., Stritzinger, M.D., Fynbo, J.P.U., Hjorth, J., Malesani, D., Michalowski, M.J., Milvang-Jensen, B. and Smith, M. 2011. The properties of SN Ib/c locations. *Astronomy & Astrophysics*, 530(A95): 1-10.
- Luo, F., Olive, K.A. and Uzan, J.P. 2011. Gyromagnetic factors and atomic clock constraints on the variation of fundamental constants. *Physical Review D*, 84(096004): 1-22.
- Makinde, O.D., Chinyoka, T. and Lebelo, R.S. 2011. Numerical investigations into CO₂ emission, O₂ depletion, and thermal decomposition in a reacting slab. *Mathematical Problems in Engineering*, 1-19.
- Makinde, O.D. and Chinyoka, T. 2011. Numerical study of unsteady hydromagnetic generalized Couette flow of a reactive third-grade fluid with asymmetric convective cooling. *Computers & Mathematics with Applications*, 61: 1167-1179.
- Makinde, O.D., Chinyoka, T. and Rundora, L. 2011. Unsteady flow of a reactive variable viscosity non-Newtonian fluid through a porous saturated medium with asymmetric convective boundary conditions. *Computers & Mathematics with Applications*, 62: 3343-3352.
- Marriner, J., Bernstein, J.P., Kessler, R., Lampeitl, H., Miquel, R., Mosher, J., Nichol, R.C., Sako, M., Schneider, D. and Smith, M. 2011. A more general model for the intrinsic scatter in type Ia supernova distance moduli. *Astrophysical Journal*, 740(72): 1-11.
- Martin, R. 2011. Semigroups of partial isometries and symmetric operators. *Integral Equations and Operator Theory*, 70: 205-226.
- Mertens, F.G., Quintero, N.R., Barashenkov, I.V. and Bishop, A.R. 2011. Refined empirical stability criterion for nonlinear Schrodinger solitons under spatiotemporal forcing. *Physical Review E*, 84: 1-11. (026614).

- Molchan, M. 2011. Nonlocal solitons in the parametrically driven nonlinear Schrödinger equation: Stability analysis. *Physical Review E*, 84(5): 056603.
- Muraki, Y., Han, C., Bennett, D.P., Suzuki, D., Monard, L.A.G., Street, R., Jorgensen, U.G., Kundurthy, P. and Smith, M. 2011. Discovery and mass measurements of a cold, 10 earth mass planet and its host star. *Astrophysical Journal*, 741: 1-15.
- Murugan, J. and Prinsloo, A. 2011. ABJM dibaryon spectroscopy. *Journal of High Energy Physics*, 129: 1-26.
- Newling, J., Varughese, M., Bassett, B.A., Campbell, H., Hlozek, R., Kunz, M., Lampeitl, H., Martin, B., Nichol, R., Parkinson, D. and Smith, M. 2011. Statistical classification techniques for photometric supernova typing. *Monthly Notices of the Royal Astronomical Society*, 414: 105-112.
- Ngoepe, M.N., Reddy, B.D., Kahn, D., Meyer, C.J., Zilla, P. and Franz, T. 2011. A numerical tool for the coupled mechanical assessment of anastomoses of PTFE arteriovenous access grafts. *Cardiovascular Engineering and Technology*, 2(3): 160-172.
- Nordin, J., Ostman, L., Goobar, A., Balland, C., Lampeitl, H., Nichol, R.C., Sako, M., Schneider, D., Smith, M., Sollerman, J. and Wheeler, J.C. 2011. Evidence for a correlation between the Si II 4000 width and type Ia supernova color. *Astrophysical Journal*, 734(42): 1-8.
- Nordin, J., Ostman, L., Goobar, A., Amanullah, R., Nichol, R.C., Smith, M., Sollerman, J., Bassett, B.A., Frieman, J., Garnavich, P.M., Leloudas, G., Sako, M. and Schneider, D. 2011. Spectral properties of type Ia supernovae up to $z \sim 0.3^{**}$. *Astronomy & Astrophysics*, 526: 1-31.
- Nzioki, A., Dunsby, P.K.S., Goswami, R. and Carloni, S. 2011. Geometrical approach to strong gravitational lensing in (R) gravity. *Physical Review D*, 83: 024030. (10pp).
- Nzioki, A., Goswami, R., Dunsby, P.K.S. and Ellis, G.F.R. 2011. Shear-free perturbations of Friedmann-Lemaître-Robertson-Walker universe. *Physical Review D*, 84: 124028. (6pp).
- Olive, K.A., Peloso, M. and Uzan, J.P. 2011. Wall of fundamental constants. *Physical Review D*, 83(4): 1-7.
- Ostman, L., Nordin, J., Goobar, A., Smith, M., Sollerman, J., Stanishev, V., Stritzinger, M.D., Bassett, B.A., Davis, T.M., Edmondson, E., Frieman, J., Garnavich, P.M., Lampeitl, H., Leloudas, G., Marriner, J., Nichol, R.C., Romer, K., Sako, M., Schneider, D. and Zheng, C. 2011. NTT and NOT spectroscopy of SDSS-II supernovae. *Astronomy & Astrophysics*, 526: 1-28.
- Plaganyi, E.E., Weeks, S.J., Skewes, T.D., Gibbs, M.T., Poloczanska, E.S., Norman-Lopez, A., Blamey, L., Soares, M. and Robinson, W. 2011. Assessing the adequacy of current fisheries management under changing climate: a southern synopsis. *ICES Journal of Marine Science*, 68(6): 1305-1371.
- Plaganyi-Lloyd, E.E., Butterworth, D.S. and Burgener, M. 2011. Illegal and unreported fishing on abalone - quantifying the extent using a fully integrated assessment model. *Fisheries Research*, 107(1-3): 221-232.
- Pototsky, A., Archer, A.J., Savel'ev, S.E., Thiele, U. and Marchesoni, F. 2011. Ratcheting of driven attracting colloidal particles: temporal density oscillations and current multiplicity. *Physical Review E*, 83: 1-14 (061401).
- Pototsky, A., Hanggi, P., Marchesoni, F. and Savel'ev, S.E. 2011. Temperature-resonant cyclotron spectra in confined geometries. *Physical Review E*, 84: 1-6. (011107).
- Raemaekers, S., Hauck, M., Burgener, M., Mackenzie, A., Maharaj, G., Plaganyi-Lloyd, E.E. and Britz, P.J. 2011. Review of the causes of the rise of the illegal South African abalone fishery and consequent closure of the rights-based fishery. *Ocean & Coastal Management*, 54: 433-445.
- Ratzkin, J. 2011. Eigenvalues of Euclidean wedge domains in higher dimensions. *Calculus of Variations and Partial Differential Equations*, 42: 93-106.
- Reddy, B.D. 2011. The role of dissipation and defect energy in variational formulations of problems in strain-gradient plasticity. Part 2: single-crystal plasticity. *Continuum Mechanics and Thermodynamics*, 23: 551-572.
- Reddy, B.D. 2011. The role of dissipation and defect energy in variational formulations of problems in strain-gradient plasticity. Part 1: polycrystalline plasticity. *Continuum Mechanics and Thermodynamics*, 23: 527-549.
- Sako, M., Bassett, B.A., Connolly, B., Dilday, B., Campbell, H., Frieman, J., Gladney, L., Kessler, R., Lampeitl, H., Marriner, J., Miquel, R., Nichol, R.C., Schneider, D., Smith, M. and Sollerman, J. 2011. Photometric type Ia supernova candidates from the three-year SDSS-II SN survey data. *Astrophysical Journal*, 738(2): 1-16.
- Sung, R. and Coles, P. 2011. Temperature and polarization patterns in anisotropic cosmologies. *Journal of Cosmology and Astroparticle Physics*, 2011(6): 1-22.
- Sung, R., Short, J. and Coles, P. 2011. Statistical characterization of cosmic microwave background temperature patterns in anisotropic cosmologies. *Monthly Notices of the Royal Astronomical Society*, 412: 492-502.
- Umeh, O.C., Larena, J. and Clarkson, C.A. 2011. The Hubble rate in averaged cosmology. *Journal of Cosmology and Astroparticle Physics*, 3: 1-29.

Uzan, J., Ellis, G.F.R. and Larena, J. 2011. A two-mass expanding exact space-time solution. *General Relativity and Gravitation*, 43: 191-205.

Uzan, J.P. 2011. Testing general relativity: from local to cosmological scales. *Philosophical Transactions of the Royal Society A-Mathematical Physical and Engineering Sciences*, 369: 5042-5057.

Uzan, J.P. 2011. Varying constants, gravitation and cosmology. *Living Reviews In Relativity*, 14(2): 1-155.

van Velzen, S., Farrar, G.R., Gezari, S., Morrell, N., Zaritsky, D., Ostman, L., Smith, M., Gelfand, J. and Drake, A.J. 2011. Optical discovery of probable stellar tidal disruption flares. *Astrophysical Journal*, 741(73): 1-24.

Vougalter, V. and Volpert, V. 2011. On the existence of stationary solutions for some non-fredholm integro-differential equations. *Documenta Mathematica*, 16: 561-580.

Yanovski, A.B. 2011. Geometric interpretation of the recursion operators for the generalized Zakharov-Shabat system in pole gauge on the lie algebra A_2 . *Journal of Geometry and Physics*, 23: 97-111.

Yanovski, A.B. 2011. On the recursion operators for the Gerdjikov, Mikhailov, and Valchev system. *Journal of Mathematical Physics*, 52: 082703. (14 pp).

Zemlyanaya, E. and Alexeeva, N.V. 2011. Numerical study of time-periodic solitons in the damped-driven NLS. *International Journal of Numerical Analysis And Modeling*, 2(2-3): 248-261.

Zunckel, C., Okouma, P., Kasanda, S.M., Moodley, K. and Bassett, B.A. 2011. Fundamental uncertainty in the BAO scale from isocurvature modes. *Physics Letters B*, 696: 433-437.

Peer-reviewed published conference proceedings

Bartle, S., McBride, A.T. and Reddy, B.D. 2011. Shell finite elements, with applications in biomechanics. In S. Kok, D.N. Wilke and H.M. Inglis (eds), *Proceedings of the 7th South African Conference on Computational and Applied Mechanics (SACAM10)*, 10-13 January 2010, University of Pretoria, South Africa. Pretoria, South Africa: SACAM. ISBN 978 0 620 49192 1.

Ellis, G.F.R. 2011. Science, technology and humanity. In J.W De Gruchy (ed.), *The Humanist Imperative in South Africa*, June 2009 and February 2010. Stellenbosch: Sun Press. ISBN 978-1-920338-56-5.

Ismail, E. and Reddy, B.D. 2011. Smoothed particle hydrodynamics for nonlinear solid mechanics. In S. Kok,

D.N. Wilke and H.M. Inglis (eds), *Proceedings of the 7th South African Conference on Computational and Applied Mechanics (SACAM10)*, 10-13 January 2010, University of Pretoria, South Africa. Pretoria, South Africa: SACAM. ISBN 978 0 620 49192 1.

Kajee, Y., Pelteret, J. and Reddy, B.D. 2011. Biomechanics of the human tongue. In S. Kok, D.N. Wilke and H.M. Inglis (eds), *Proceedings of the 7th South African Conference on Computational and Applied Mechanics (SACAM10)*, 10-13 January 2010, University of Pretoria, South Africa. Pretoria, South Africa: SACAM. ISBN 978 0 620 49192 1.

Morrissey, H., Reddy, B.D., McBride, A.T. and Bowles, H.C. 2011. The modelling of fibre-reinforced composites using a multi-scale methodology. In S. Kok, D.N. Wilke and H.M. Inglis (eds), *Proceedings of the 7th South African Conference on Computational and Applied Mechanics (SACAM10)*, 10-13 January 2010, University of Pretoria, South Africa. Pretoria, South Africa: SACAM. ISBN 978 0 620 49192 1.

Nadjasngar, R., Inggs, M.R., Paichard, Y. and Morrison, N. 2011. A new probabilistic data association filter based on composite expanding and fading memory polynomial filters. In, *Proceedings of Radar Conference 2011*, 23-27 May 2011, Kansas City, MO. Kansas City, MO: IEEE. ISBN 978-1-4244-8902-2.

Rommelzwaal, L., Tapson, J.C. and Ellis, G.F.R. 2011. Combination of diffuse and local connections in the cortex. In *Proceedings of IEEE 2011 AFRICON*, 13-15 September 2011, Victoria Falls, Livingstone, Zambia. Zambia: IEEE. ISBN 978-1-61284-991-1.

Richardson, N., McBride, A.T. and Reddy, B.D. 2011. An investigation of algorithms for rate-independent single crystal plasticity. In S. Kok, D.N. Wilke and H.M. Inglis (eds), *Proceedings of the 7th South African Conference on Computational and Applied Mechanics (SACAM10)*, 10-13 January 2010, University of Pretoria, South Africa. Pretoria, South Africa: SACAM. ISBN 978 0 620 49192 1.

Yanovski, A.B. 2011. Poisson-Nijenhuis structure for generalized Zakharov-Shabat system in pole gauge on the algebra $sl(3, C)$. In I.M. Mladenov, G. Vilasi and A. Yoshioka (eds), *Proceedings of the Twelfth International Conference on Geometry, Integrability and Quantization*, 4-9 June 2011, Sts. Constantine and Elena, Bulgaria. Sofia: Avangard Prima. ISSN 1314-3247.

Yanovski, A.B. and Caires Dos Santos, M. 2011. Quadratic Casimir invariants for "universal" lie algebra extensions. In I.M. Mladenov, G. Vilasi and A. Yoshioka (eds), *Proceedings of the Twelfth International Conference on Geometry, Integrability and Quantization*, 4-9 June 2011, Sts. Constantine and Elena, Bulgaria. Sofia: Avangard Prima. ISSN 1314-3247.

DEPARTMENT OF MOLECULAR AND CELL BIOLOGY

HEAD OF DEPARTMENT – ASSOCIATE PROFESSOR VERNON COYNE

DEPARTMENTAL PROFILE

The Department has interests and expertise in diverse areas of biology. The problem of desiccation in plants is being tackled by a combination of physiological and molecular approaches. Plant biotechnology research is focused on developing virus-resistant and drought-tolerant crops, “biopharming” (the expression of pharmaceutically-important proteins in plants) and the molecular basis of nickel hyperaccumulation in plants. Plant defence responses are studied in both model and crop plants. Circadian rhythms and their role in plant development and responses, as well as sports performance in humans, are studied. Eukaryotic gene expression projects include the role of chromatin modifications in regulating the rhythms of gene expression and gene expression during neuronal differentiation and stress. Basic mechanisms underlying the regulation of gene expression are studied in human cells and in *Plasmodium*, with a view to pinpoint *Plasmodium*-specific mechanisms that can be exploited to develop novel anti-malarial drugs. In addition, the actions of mammalian hormones, synthetic contraceptives and steroid receptors are being investigated with a view to understanding mechanisms, integration of signalling pathways and role in HIV pathogenesis. Research on viral pathogenesis also includes protein structure-function studies of the envelope protein and its role in HIV transmission. Evolutionary biology projects focus on mechanisms that shape both genomic and population-level diversity, as well as evolution of limb development in bats. Molecular virology studies focus on the expression of antigens from viruses in plants and in insect cells for use as human and animal vaccines, on the genetic diversity and molecular biology of single-stranded DNA viruses of plants and animals, and papillomaviruses of primates and humans. Structural studies are being carried out by electron microscopy and X-ray crystallography on a number of proteins, including glutamine synthetase and members of the nitrilase superfamily, to obtain insights necessary for rational drug and industrial enzyme design. Research in marine biotechnology includes genetic and proteomic studies of the immune response of the abalone (*Haliotis midae*) and the stress and disease response systems of the commercially important seaweed *Gracilaria gracilis*. In addition, probiotics are being developed to improve the growth rate and disease resistance of farmed abalone. Research in microbiology includes molecular-genetic investigations of industrially and medically important anaerobic bacteria such as *Corynebacterium*, *Bacteroides*

fragilis, *Bifidobacterium* and the fibre-degrading bacteria in the ostrich gut. The taxonomy of antibiotic-producing actinobacteria is being investigated. The Department also runs an analytical facility (amino acid analysis, DNA sequencing, DNA synthesis, DNA microarrays and protein identification). The instrumentation in the facility consists of HPLCs, a GC MS/MS and LC-ESI QTOF and MALDI instruments for mass spectrometry.

RESEARCH HIGHLIGHTS

Awards

Professor Jill Farrant won a 2011/12 L'Oréal-UNESCO Award in Life Sciences (<http://www.uct.ac.za/mondaypaper/archives/?id=8876>).

Professor Farrant was also elected as a Fellow of TWAS, the academy of sciences for the developing world (previously the Third World Academy of Sciences; <http://twas.ictp.it/>).

Professor Ed Rybicki became a UCT Fellow (<http://www.uct.ac.za/mondaypaper/archives/?id=8867>).

Dr Rob Ingle won a Young Researcher Award from the UCT College of Fellows (<http://www.uct.ac.za/mondaypaper/archives/?id=8868>).

NRF A-Rated staff

Professor Ed Rybicki obtained an A rating in the 2011 round of NRF rating re-evaluations (<http://www.uct.ac.za/mondaypaper/?id=8896>). Professor Jill Farrant also holds an NRF A rating.

DEPARTMENTAL STATISTICS

Permanent and Long-Term Contract Staff

Professors	4
Associate Professors	3
Senior Lecturers	2
Lecturers	6
Research Staff	10
Technical Support Staff	7
Administrative and Clerical Staff	5
TOTAL	37

Honorary Staff

Honorary Professors	2
TOTAL	2

Students

Post-doctoral	10
Doctoral	34
Master's	30
Honours	14
Undergraduate	253
TOTAL	341

RESEARCH FIELDS AND STAFF

Permanent Staff

ASSOCIATE PROFESSOR VERNON COYNE

Head of Department; marine biotechnology.

PROFESSOR JILL FARRANT

Desiccation tolerance; resurrection plants; seeds; plant physiology; molecular biology.

PROFESSOR JANET HAPGOOD

Molecular mechanisms of cell signalling and eukaryotic gene regulation via steroid receptors: role in HIV pathogenesis, immune and reproductive function.

PROFESSOR NICOLA ILLING

Evolution of development; regulation of gene expression; limb development, neurobiology; microarray analysis.

PROFESSOR EDWARD RYBICKI

Plant- and tissue culture-derived vaccines; oceanic viromics; Human papillomavirus (HPV); rotavirus; bluetongue virus; Beak and feather disease virus; geminivirus; Maize streak virus; molecular virology; molecular biotechnology.

ASSOCIATE PROFESSOR VAL ABRATT

Bacteroides fragilis; nitrogen metabolism; virulence; metronidazole; DNA damage and repair; *Bifidobacterium*; *Lactobacillus*; probiotics.

ASSOCIATE PROFESSOR SHARON REID

Gram-positive and anaerobic bacteria; *Clostridium acetobutylicum*; *Bifidobacterium*; *Lactobacillus*, gene regulation of nitrogen- and carbon-substrate utilisation; probiotics; molecular systematics; biofuels.

DR COLLEEN O'RYAN

Senior lecturer; molecular, evolutionary and population genetics.

DR LAURA RODEN

Senior Lecturer; flowering time and photoperiodism; plant and human circadian rhythms; regulation of plant gene expression; plant molecular biology; *Arabidopsis* genetics.

DR ROBERT INGLE

Lecturer; interactions between plants and their environment (plant innate immunity, metal hyperaccumulating plants).

DR PAUL MEYERS

Lecturer; actinobacteria; family *Streptosporangiaceae*; *Streptomyces*; *Amycolatopsis*; *Kribbella*; bacterial taxonomy; "bioprospecting"; novel antitubercular antibiotics.

DR THOMAS OELGESCHLÄGER

Lecturer; molecular mechanisms of RNA polymerase II transcription regulation in eukaryotes; core promoter-selective transcription regulation mechanisms; transcription regulation in *Plasmodium falciparum*.

DR SUHAIL RAFUDEEN

Lecturer; abiotic stress tolerance in plants; signalling and regulation of plant gene expression during stress; plant molecular biology; proteomics (protein expression profiling, protein mining); *Xerophyta viscosa*; maize; Tef.

DR JERRY RODRIGUES

Lecturer; protein chemistry; drug discovery; plant desiccation tolerance; polyphenol research.

DR ZENDA WOODMAN

Lecturer; HIV: structure-function and viral fitness; biochemical analysis of envelope's role in HIV pathogenesis.

Honorary Staff

EMERITUS ASSOCIATE PROFESSOR WOLF BRANDT

Protein chemistry; proteomics; MALDI-TOF mass-spectrometry; HPLC, desiccation tolerance; polyphenols.

EMERITUS PROFESSOR HORST KLUMP

Physical biochemistry; uncommon DNA structures; self-assembly nanostructures; drug delivery systems; non-equilibrium DNA structures; triplet repeat diseases; origin and early development of the genetic code.

EMERITUS PROFESSOR JENNIFER THOMSON

Transgenic maize for resistance to the African *Maize streak virus* and tolerance to drought.

Contract Research Staff

DR ANDREA DU TOIT

Post-doctoral fellow; novel mechanisms of rapid, non-genomic reciprocal cross talk between the glucocorticoid receptor and the gonadotropin-releasing hormone receptor.

DR KERRY GORDON

Post-doctoral fellow; HIV-1 envelope structure and function; understanding the glycosylation requirements of HIV-1 envelope during transmission.

DR INGA HITZEROTH

Senior Research Officer; plant-derived vaccines; Human Papillomaviruses (HPV), Beak and Feather disease virus (BFDV), Rotavirus and Influenza virus.

DR KERSHINI IYER

Post-doctoral fellow; plant biotechnology; promoter studies of stress-associated genes from *Zea mays* and *Xerophyta viscosa*.

DR REVEL IYER

Research scientist; agricultural biotechnology; plant molecular biology; plant transgenics.

DR ANN MEYERS

Research Officer; plant-produced proteins and vaccines; bluetongue virus; Rift Valley fever virus; *Gracilaria gracilis* transformation studies; recombinant protein expression in *Gracilaria gracilis*.

DR SHANE MURRAY

Lecturer; crop genomics and transcriptomics; resistance in maize and grapevine to pathogens (fungi, viruses and phytoplasma).

DR HANLIE NELL

Post-doctoral fellow; plant stress biology; characterisation of the carbon source for soluble carbohydrate accumulation in the resurrection plant *Xerophyta humilis*.

DR LYNTHIA PAUL

Post-doctoral fellow; *Bacteroides fragilis* metronidazole resistance; mutational analysis; metronidazole uptake; flotillin; DNA recombination and repair genes.

DR DIONNE SHEPHERD

Research Officer; virology and plant biotechnology; development of maize streak virus-resistant maize; maize streak virus diversity; plant-virus interactions.

DR MICHELE TOMASICCHIO

Post-doctoral fellow; glucocorticoid receptor (GR) transcriptional signalling; cross talk between HIV-1 Vpr and the GR in transcriptional regulation of host genes.

RESEARCH OUTPUT

Chapters in books

Klump, H. 2011. Mutationen haben ihren Wert und ihren Preis: Metastabile DNA-Strukturen und die Konsequenzen. In *Molekule Aus Dem All*, pp. 189-216. Germany: Wiley-VCH Verlag. ISBN 978-3-527-32877-2.

Morse, M., Rafudeen, M.S. and Farrant, J.M. 2011. An overview of the current understanding of desiccation tolerance in the vegetative tissues of higher plants. In I. Turkan (ed.), *Advances in Botanical Research*, pp. 319-347. USA: Academia Press, Belgium. ISBN 978-0-12-387692-8.00.

Articles in Peer-reviewed Journals

Africander, D., Louw, R., Verhoog, N., Noeth, D. and Hapgood, J. 2011. Differential regulation of endogenous pro-inflammatory cytokine genes by medroxyprogesterone acetate and norethisterone acetate in cell lines of the female genital tract. *Contraception*, 84(4): 423-435.

Africander, D., Verhoog, N. and Hapgood, J. 2011. Molecular mechanisms of steroid receptor-mediated actions by synthetic progestins used in HRT and contraception. *Steroids*, 76: 636-652.

Bhardwaj, V., Meier, S., Petersen, L., Ingle, R.A. and Roden, L.C. 2011. Defence responses of *Arabidopsis thaliana* to infection by *Pseudomonas syringae* are regulated by the circadian clock. *PLoS One*, 6(10): e26968. (8pp).

Chopera, D., Mlotshwa, M., Woodman, Z., Mlisana, K., de Assis Rosa, D., Martin, D.P., Abdool Karim, Q., Gray, C.M., Williamson, C. and caprisa 002 study team, c. 2011. Virological and immunological factors associated with HIV-1 differential disease progression in HLA-B* 58:01- Positive individuals. *Journal of Virology*, 85(14): 7070-7080.

Coyne, V.E. 2011. The importance of ATP in the immune system of molluscs. *ISJ-Invertebrate Survival Journal*, 8(1): 48-55.

Everest, G. and Meyers, P. 2011. Evaluation of the antibiotic biosynthetic potential of the genus *Amycolatopsis* and description of *Amycolatopsis circi* sp. nov., *Amycolatopsis equina* sp. nov. and *Amycolatopsis hippodromi* sp. nov. *Journal of Applied Microbiology*, 111: 300-311.

Everest, G., Cook, A.E., Kirby, B. and Meyers, P. 2011. Evaluation of the use of recN sequence analysis in the phylogeny of the genus *Amycolatopsis*. *Antonie Van Leeuwenhoek International Journal of General and Molecular Microbiology*, 100: 483-496.

Everest, G., Cook, A.E., Le Roes, M. and Meyers, P. 2011. *Nocardia rhamnosiphila* sp. nov., isolated from soil*. *Systematic and Applied Microbiology*, 34: 508-512.

Farrant, J.M. and Moore, J.P. 2011. Programming desiccation-tolerance: from plants to seeds to resurrection plants. *Current Opinion in Plant Biology*, 14(2011): 340-345.

Faulkes, C.G., Bennett, N., Cotterill, F., Stanley, W., Mgode, G.F. and Verheyen, E. 2011. Phylogeography and cryptic diversity of the solitary-dwelling silvery mole-rat. *Journal of Zoology*, 295: 324-338.

- Galvao, B., Meggersee, R.L. and Abratt, V.R. 2011. Antibiotic resistance and adhesion potential of *Bacteroides fragilis* clinical isolates from Cape Town, South Africa. *Anaerobe*, 17(2011): 142-146.
- Ginbot, Z. and Farrant, J.M. 2011. Physiological response of selected eragrostis species to water-deficit stress. *African Journal of Biotechnology*, 10(51): 10405-10417.
- Goldsmith, D.B., Crosti, G., Dwivedi, B., McDaniel, L.D., Varsani, A., Suttle, C.A., Weinbauer, M.G., Sandaa, R.A. and Breitbart, M. 2011. Development of *phoH* as a novel signature gene for assessing marine phage diversity. *Applied and Environmental Microbiology*, 77(21): 7730-7739.
- Goodier, S., Cotterill, F., O'Ryan, C., Skelton, P.H. and de Wit, M.J. 2011. Cryptic diversity of African Tigerfish (Genus *Hydrocynus*) reveals palaeogeographic signatures of linked neogene geotectonic events. *PLoS One*, 6(12): e28775. (15pp).
- Hadfield, J., Martin, D.P., Stainton, D., Kraberger, S., Owor, B.E., Shepherd, D.N., Lakay, F., Markham, P.G., Greber, R.S., Briddon, R. and Varsani, A. 2011. *Bromus catharticus* striate mosaic virus: a new mastrevirus infecting *Bromus catharticus* from Australia. *Archives of Virology*, 156: 335-341.
- Hadfield, J., Linderme, D., Shepherd, D.N., Bezuidenhout, M.E., Lefeuvre, P., Martin, D.P. and Varsani, A. 2011. Complete genome sequence of a dahlia common mosaic virus isolate from New Zealand. *Archives of Virology*, 156: 2297-2301.
- Hadley, K., Louw, A. and Hapgood, J. 2011. Differential nuclear localisation and promoter occupancy play a role in glucocorticoid receptor ligand-specific transcriptional responses. *Steroids*, 76(2011): 1176-1184.
- Hosseini, A., Massumi, H., Heydarnejad, J., Pour, A.H. and Varsani, A. 2011. Characterisation of potato virus Y isolates from Iran. *Virus Genes*, 42: 128-140.
- Kamngona, A., Moore, J.P., Lindsey, G.G. and Brandt, W.F. 2011. Inhibition of HIV-1 and M-MLV reverse transcriptases by a major polyphenol(3,4,5 tri-O-galloylquinic acid) present in the leaves of the South African resurrection plant, *Myrothamnus flabellifolia*. *Journal of Enzyme Inhibition and Medicinal Chemistry*, 26(6): 843-853.
- Kemp, I.K. and Coyne, V.E. 2011. Identification and characterisation of the *Mpeg1* homologue in the South African abalone, *Haliotis midae*. *Fish & Shellfish Immunology*, 31: 754-764.
- Kibinza, S., Bazin, J., Bailly, C., Farrant, J.M., Corbineau, F. and Bouteau, H. 2011. Catalase is a key enzyme in seed recovery from ageing during priming. *Plant Science*, 181(2011): 309-315.
- Le Roes-Hill, M., Rohland, J. and Burton, S.G. 2011. Actinobacteria isolated from termite guts as a source of novel oxidative enzymes. *Antonie Van Leeuwenhoek International Journal of General and Molecular Microbiology*, 100: 589-605.
- Lefeuvre, P., Harkins, G.W., Lett, J.-M., Briddon, R., Chase, M., Moury, B. and Martin, D.P. 2011. Evolutionary time-scale of the begomoviruses: evidence from integrated sequences in the nicotiana genome. *PLoS One*, 6(5): e19193. (10pp).
- Liebenberg, L., Gamielien, H., Mkhize, N., Jaumdally, S.Z., Gumbi, P., Denny, L.A. and Passmore, J.S. 2011. Stability and transport of cervical cytobrushes for isolation of mononuclear cells from the female genital tract. *Journal of Immunological Methods*, 367: 47-55.
- Lloyd, A.J., Allwood, W.J., Winder, C., Dunn, W.B., Heald, J.K., Cristescu, S.M., Sivakumaran, A., Harren, F.J.M., Mulema, J., Denby, K.J., Goodacre, R., Smith, A. and Mur, L.A.J. 2011. Metabolomic approaches reveal that cell wall modifications play a major role in ethylene-mediated resistance against *Botrytis cinerea*. *Plant Journal*, 67: 852-868.
- Mall, A.S., Lotz, Z., Tyler, M., Goldberg, P.A., Rodrigues, J.D.E.A., Kahn, D., Chirwa, N. and Govender, D. 2011. Immunohistochemical and biochemical characterization of mucin in pseudomyxoma peritonei: a case study. *Gastroenterology*, 5: 5-16.
- Martin, D.P., Lefeuvre, P., Varsani, A., Hoareau, M., Semegni, J.E., Dijoux, B., Vincent, C., Reynaud, B. and Lett, J.-M. 2011. Complex recombination patterns arising during geminivirus coinfections preserve and demarcate biologically important intra-genome interaction networks. *PLOS Pathogens*, 7(9): e1002203. (14pp).
- Martin, D.P., Linderme, D., Lefeuvre, P., Shepherd, D.N. and Varsani, A. 2011. *Eragrostis minor* streak virus: an Asian streak virus in Africa. *Archives of Virology*, 156: 1299-1303.
- Martin, D.P., Biagini, P., Lefeuvre, P., Golden, M., Roumagnac, P. and Varsani, A. 2011. Recombination in Eukaryotic single stranded DNA viruses. *Viruses-Basel*, 3: 1699-1738.
- Martin, D.P., Briddon, R. and Varsani, A. 2011. Recombination patterns in dicot-infecting mastreviruses mirror those found in monocot-infecting mastreviruses. *Archives of Virology*, 156: 1463-1469.
- Monjane, A., Van der Walt, E., Varsani, A., Rybicki, E.P. and Martin, D.P. 2011. Recombination hotspots and host susceptibility modulate the adaptive value of recombination during maize streak virus evolution. *BMC Evolutionary Biology*, 11:350. (14pp).

- Monjane, A., Harkins, G.W., Martin, D.P., Lemey, P., Lefevre, P., Shepherd, D.N., Oluwafemi, S., Simuyandi, M., Zinga, I., Komba, E., Lakoutene, D.P., Mandakombo, N., Mboukoulida, J., Semballa, S., Tagne, A., Tiendrebeogo, F., Erdmann, J.B., Van Antwerpen, T., Owor, B., Flett, B., Ramusi, M., Windram, O.P., Syed, R., Lett, J.-M., Briddon, R., Markham, P.G., Rybicki, E.P. and Varsani, A. 2011. Reconstructing the history of maize streak virus strain: a dispersal to reveal diversification hot spots and its origin in Southern Africa. *Journal of Virology*, 85(18): 9623-9636.
- Moore, J.P., Waldron, M.E., Lindsey, G.G., Farrant, J.M. and Brandt, W.F. 2011. An ultrastructural investigation of the surface microbiota present on the leaves and reproductive structures of the resurrection plant *Myrothamnus flabellifolia*. *South African Journal of Botany*, 77(2011): 485-491.
- Mulaudzi, T., Ludidi, N., Ruzvidzo, O., Morse, M., Hendricks, N., Iwuoha, E. and Gehring, C. 2011. Identification of a novel *Arabidopsis thaliana* nitric oxide-binding molecule with guanylate cyclase activity in vitro. *Febs Journal*, 269: 2693-2697.
- Mulema, J., Okori, P. and Denby, K.J. 2011. Proteomic analysis of the *Arabidopsis thaliana*-*Botrytis cinerea* interaction using two-dimensional liquid chromatography. *African Journal of Biotechnology*, 10(76): 17551-17563.
- Nelson-Flower, M., Hockey, P.A.R., O'Ryan, C., Raihani, N.J., Du Plessis, M.A. and Ridley, M. 2011. Monogamous dominant pairs monopolize reproduction in the cooperatively breeding pied babbler. *Behavioral Ecology*, 22: 559-565.
- Nofemela, A., Bandawe, G.P., Thebus, R., Marais, J., Wood, N., Hoffmann, O., Maboko, L., Hoelscher, M., Woodman, Z. and Williamson, C. 2011. Defining the human immunodeficiency virus type 1 transmission genetic bottleneck in a region with multiple circulating subtypes and recombinant forms. *Virology*, 415: 107-113.
- Owor, B., Martin, D.P., Rybicki, E.P., Thomson, J.A., Bezuidenhout, M.E., Lakay, F. and Shepherd, D.N. 2011. A rep-based hairpin inhibits replication of diverse maize streak virus isolates in a transient assay. *Journal of General Virology*, 92: 2458-2465.
- Paul, L., Patrick, S., Nord, C. and Abratt, V.R. 2011. The role of *Bacteroides fragilis* RecQ DNA helicases in cell survival after metronidazole exposure. *Fems Microbiology Letters*, 319: 125-132.
- Ripamonti, U., Roden, L.C., Ferretti, C. and Klar, R. 2011. Biomimetic matrices self-initiating the induction of bone formation. *Journal of Craniofacial Surgery*, 22(5): 1859-1870.
- Rosario, K., Marinov, M., Stainton, D., Kraberger, S., Wiltshire, E.J., Collings, D.A., Walters, M., Martin, D.P., Breitbart, M. and Varsani, A. 2011. Dragonfly cyclovirus, a novel single-stranded DNA virus discovered in dragonflies (Odonata: Anisoptera). *Journal of General Virology*, 92: 1302-1308.
- Rybicki, E.P., Williamson, A.-L., Meyers, A.E. and Hitzeroth, I.I. 2011. Vaccine farming in Cape Town. *Human Vaccines*, 7(3): 1-10.
- Salari, K., Massumi, H., Heydarnejad, J., Pour, A.H. and Varsani, A. 2011. Analysis of Iranian Potato virus S isolates. *Virus Genes*, 43: 281-288.
- Semegni, J.E., Wamalwa, M., Gaujoux, R., Harkins, G.W., Gray, A. and Martin, D.P. 2011. NASP: a parallel program for identifying evolutionarily conserved nucleic acid secondary structures from nucleotide sequence alignments. *Bioinformatics*, 27(17): 2443-2445.
- Tanzer, F.L., Shephard, E.G., Palmer, K.E., Burger, M., Williamson, A.-L. and Rybicki, E.P. 2011. The porcine circovirus type 1 capsid gene promoter improves antigen expression and immunogenicity in a HIV-1 plasmid vaccine. *Virology Journal*, 8:51. (10pp). <http://www.virologyj.com/content/8/1/51>.
- Theron, G. and Reid, S.J. 2011. ArgR-promoter interactions in *Corynebacterium glutamicum* arginine biosynthesis. *Biotechnology and Applied Biochemistry*, 58: 119-127.
- Valley-Omar, Z., Meyers, A.E., Shephard, E.G., Williamson, A.-L. and Rybicki, E.P. 2011. Abrogation of contaminating RNA activity in HIV-1 Gag VLPs. *Virology Journal*, 8(2011): E462. (12pp). www.virologyj.com/content/8/1/462.
- Van Coeverden de Groot, P.J., Putnam, A.S., Erb, P., Scott, C., Melnick, D., O'Ryan, C. and Boag, P.T. 2011. Conservation genetics of the black rhinoceros *Diceros bicornis bicornis*, in Namibia. *Conservation Genetics*, 12: 783-792.
- Van Rooyen, J., Abratt, V.R., Belrhali, H. and Sewell, B.T. 2011. Crystal structure of type III glutamine synthetase: surprising reversal of the inter-ring interface. *Structure*, 19: 471 – 483.
- Van Rooyen, J., Belrhali, H., Abratt, V.R. and Sewell, B.T. 2011. Proteolysis of the type III glutamine synthetase from *Bacteroides fragilis* causes expedient crystal-packing rearrangements. *Acta Crystallographica Section F-Structural Biology and Crystallization Communications*, F67(2011): 358-363.
- Varsani, A., Regnard, G., Bragg, R., Hitzeroth, I.I. and Rybicki, E.P. 2011. Global genetic diversity and geographical and host-species distribution of beak and

feather disease virus isolates. *Journal of General Virology*, 92: 752-767.

Verhoog, N., Kotitschke, A., Avenant, C. and Hapgood, J. 2011. Glucocorticoid-independent repression of tumor necrosis factor (TNF) α -stimulated Interleukin(il)-6 expression by the glucocorticoid receptor. *Journal of Biological Chemistry*, 286(22): 19297-19310.

Woodman, Z., Mlisana, K., Treurnicht, F., Abrahams, M.H., Thebus, R., Abdool Karim, S. and Williamson, C. 2011. Short communication: decreased incidence of dual infections in South African subtype C-infected women compared to a cohort ten years earlier. *AIDS Research and Human Retroviruses*, 27(11): 1167-1172.

Peer-reviewed published conference proceedings

Chege, G., Burgers, W., Meyers, A.E., Stutz, H., Kiravu, A., Bunjun, R., Chapman, R.E., Shephard, E.G., Rybicki, E.P. and Williamson, A.-L. 2011. A prime-boost immunization with an auxotrophic BCG expressing HIV-1Gag and Gag VLPs induces broad, polyfunctional memory T cell responses in baboons. In *Proceedings of AIDS Vaccine 2011*, 12-15 September 2011, Bangkok, Thailand. USA: Mary Ann Liebert Inc. ISSN 0889-2229.

Van Hille, R.P., van Wyk, N., Motleleng, L. and Mooruth, N. 2011. Lessons in passive treatment: Towards efficient operation of a sulphate reduction - sulphide oxidation system. In T.R. Rude, A. Freund and C. Wolkersdorfer (eds), *Proceedings of the 11th Congress of the International Mine Water Association*, 4-11 September 2011, Aachen, Germany. Germany: RWTH Aachen University, Institute of Hydrogeology on behalf of the International Mine Water Association. ISBN 978-3-00-035543-1.

DEPARTMENT OF OCEANOGRAPHY

(Including the Nansen-Tutu Centre for Marine Environmental Research and the Research Diving Unit)

HEAD OF DEPARTMENT: PROFESSOR CHRIS REASON

DEPARTMENTAL PROFILE

The Department of Oceanography is the only such Department in sub-Saharan Africa, and is the major focus for research in physical oceanography, atmospheric science, ocean circulation, and climate in South Africa and elsewhere in Africa. The Department has research groupings in sea-going observations, satellite marine remote sensing, coastal oceanography, ocean and atmospheric modelling, marine and coastal meteorology, severe weather, the science underpinning operational oceanography, and climate variability and change. Six scientists in the Department have been favourably evaluated in the review process of the National Research Foundation. Active international associations are maintained by collaborative projects with the Netherlands, France, Germany, Spain, the UK, Australia, USA and Canada. The Department maintains close contact with marine science activities in the governmental, private and academic sectors in South Africa and into Africa. The UCT Research Diving Unit (RDU) is housed within the Department and is fully equipped with a decompression chamber and compressor. Most scientific diving at UCT is carried out in conjunction with the RDU.

DEPARTMENTAL STATISTICS

Permanent and Long-term Contract Staff

Professors	2
Senior Lecturer	2
Lecturer	1
Research Staff	1
Technical Support Staff	2
Administrative and Clerical Staff	2
Total	10

Honorary Staff

Emeritus Professor	3
Honorary Professor	1
Honorary Research Associates	8
Total	10

Students

Postdoctoral Fellows	9
Doctoral	26
Master's	21
Honours	10
Undergraduate	158
Total	224

RESEARCH FIELDS AND STAFF

Permanent Staff

PROFESSOR C.J.C. REASON

Head of Department; Southern Hemisphere climate variability and change; coastal and mesoscale meteorology, regional oceanography, modeling.

PROFESSOR F.A. SHILLINGTON

Shelf oceanography; satellite marine remote sensing.

DR I.J. ANSORGE

Senior Lecturer; Southern Ocean.

DR H.N. WALDRON

Senior Lecturer; environmental oceanography.

MR C. WHITTLE

Senior Scientific Officer; satellite marine remote sensing.

MR P. HANEKOM

Diving Supervisor; ocean diving.

ADMINISTRATIVE OFFICER

Mrs C. Khai

RESOURCE CENTRE OFFICER

Mrs N. Jabaar

SARCHI

PROFESSOR S.G.H. PHILANDER

Ocean-atmosphere numerical modeling.

Contract Research Staff

DR M. ROUAULT

Ocean-atmosphere interaction.

Emeritus Professors

PROFESSOR G.B. BRUNDRIT

Operational oceanography

PROFESSOR J.G. FIELD

Marine Research Institute

PROFESSOR J.R.E. LUTJEHARMS

Ocean climatology

Honorary Professors

PROFESSOR L.V. SHANNON

Benguela ecosystem

Honorary Research Associates

DR S. BERNARD

Optical oceanography

DR D. BYRNE

Agulhas Current

DR C. DUNCOMBE RAE

Coastal ocean dynamics

DR K. FINDLAY

Whales

DR J. HERMES

Regional ocean modelling

DR P. MONTEIRO

Environmental oceanography

DR A. MAVUME

Tropical cyclones

EMERITUS PROFESSOR G. SIEDLER

Deep sea oceanography

Distinguished Visitors

DR A. BIASTOCH

University of Kiel, Germany, Ocean numerical modelling

Postdoctoral Fellows

DR B. BACKEBERG

Agulhas Current modelling

DR F. DUFOIS

Coastal oceanography

DR N. FAUCHEREAU

Air-sea interaction

DR C. PALMER

Marine Chemistry

DR N. RASCLE

Climate and ocean modelling

DR R. ROMAN

Agulhas Current

DR S. SWART

Southern ocean Biogeochemistry

DR A. TAGLIABUE

Southern ocean Biogeochemistry

DR S. THOMALLA

Southern ocean

CONTACT DETAILS

Postal Address: Department of Oceanography, University of Cape Town,

Private Bag X3, Rondebosch, 7701

Telephone: +27 21 650 3277

Fax: +27 21 650 3979

E-mail: claire.khai@uct.ac.za

Web: <http://www.sea.uct.ac.za>

UCT General enquiries: +27 21 650 9111

UCT web: <http://www.uct.ac.za>

RESEARCH OUTPUT

Authored books

Bernard, S. and Smith, M.E. 2011. An Investigation of the Potential use of Ocean Colour Remote Sensing to Assess the Influence of Variations in Freshwater Inputs to Coastal Ecosystems: Phytoplankton and Sediment Dynamics of the Natal Bight. WRC Report no. 1852/1/10. Pretoria: Water Research Commission. 38pp. ISBN 9781770059818.

Chapters in books

Lutjeharms, J.R.E. 2011. Marine off-shore environment: introduction. In L. Zietsman (ed.), *Observations on Environmental Change in South Africa*, pp. 263-263. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Lutjeharms, J.R.E. 2011. The Southern African oceans. In L. Zietsman (ed.), *Observations on Environmental Change in South Africa*, pp. 264-267. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Reason, C.J.C. and Hermes, J.C. 2011. Climate change and variability in southern Africa and regional ocean influences. In L. Zietsman (ed.), *Observations on Environmental Change in South Africa*, pp. 270-273. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Rouault, M., Penven, P. and Pohl, B. 2011. On the recent warming of the Agulhas current. In L. Zietsman (ed.), *Observations on Environmental Change in South Africa*, pp. 268-270. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Smith, A.M., Mather, A.A., Theron, A.K. and Guastella, A.M. 2011. The 2006-2007 KwaZulu-Natal coastal erosion event in perspective. In L. Zietsman (ed.), *Observations on Environmental Change in South Africa*, pp. 222-226. Stellenbosch: SUN MeDIA Stellenbosch. ISBN 9781920338244.

Articles in Peer-reviewed Journals

Atkinson, L., Field, J. and Hutchings, L. 2011. Effects of demersal trawling along the west coast of southern Africa: multivariate analysis of benthic assemblages. *Marine Ecology-Progress Series*, 430: 241-255.

Barlow, R., Lamont, T., Kyewalyanga, M., Sessions, H., Van den Berg, M. and Duncan, F. 2011. Phytoplankton production and adaptation in the vicinity of Pemba and Zanzibar islands, Tanzania. *African Journal of Marine Science*, 33(2): 283-295.

Beal, L.M., de Ruijter, W.P.M., Biastoch, A., Zahn, R., Cronin, M., Hermes, J.C., Lutjeharms, J.R.E., Quartly, G.D., Tozuka, T., Baker-Yeboah, S., Bornman, T.G., Cipollini, P., Dijkstra, H., Hall, I., Park, W., Peeters, F., Penven, P., Ridderinkhof, H. and Zinke, J. 2011. On the role of the Agulhas system in ocean circulation and climate. *Nature*, 472: 429-436.

Bouman, H., Scanlan, D.J. and Barlow, R. 2011. Water-column stratification governs the community structure of subtropical marine picophytoplankton. *Environmental Microbiology Reports*, 3(4): 473-482.

Burls, N., Reason, C.J.C., Penven, P. and Philander, G. 2011. Similarities between the tropical Atlantic seasonal cycle and ENSO: An energetics perspective. *Journal of Geophysical Research-Oceans*, 116: C11010. (25pp).

Cokeron, P.J., Minton, G., Collins, T., Findlay, K.P., Willson, A. and Baldwin, R. 2011. Spatial models of sparse data to inform cetacean conservation planning: an example from Oman. *Endangered Species Research*, 15: 39-52.

De Ruijter, W.P.M., Reason, C.J.C., Ansoorge, I.J., Roman, R. and Gordon, A.L. 2011. Johann R. E. Lutjeharms (1944-2011). *EOS*, 92(38): 316.

Duffa, C., Dufois, F. and Coudray, S. 2011. An operational model to simulate post-accidental radionuclide transfers in Toulon marine area: preliminary development. *Ocean Dynamics*, 61: 1811-1821.

Durgadoo, J., Ansoorge, I.J., De Cuevas, B.A., Lutjeharms, J.R.E. and Coward, A.C. 2011. Decay of eddies at the South-West Indian Ridge. *South African Journal of Science*, 107(11/12): 1-10.

Elwen, S.H., Findlay, K.P., Kiszka, J. and Weir, C.R. 2011. Cetacean research in the southern African subregion: a

- review of previous studies and current knowledge. *African Journal of Marine Science*, 33(3): 469-493.
- Everingham, Y.L. and Reason, C.J.C. 2011. Interannual variability in rainfall and wet spell frequency during the New South Wales sugarcane harvest season. *International Journal of Climatology*, 31: 144-152.
- Fauchereau, N., Tagliabue, A., Bopp, L. and Monteiro, P.M.S. 2011. The response of phytoplankton biomass to transient mixing events in the Southern Ocean. *Geophysical Research Letters*, 38: L17601. (6pp).
- Field, J.G. and Ansorge, I.J. 2011. Johann R.E. Lutjeharms FRSSAf 13 April 1944 8 June 2011. *Transactions of the Royal Society of South Africa*, 66(2): 152-153.
- Findlay, K.P., Cockcroft, F.G. and Guissamulo, A.T. 2011. Dugong abundance and distribution in the Bazaruto Archipelago, Mozambique. *African Journal of Marine Science*, 33(3): 441-452.
- Findlay, K.P., Best, P.B. and Meyer, M.A. 2011. Migrations of humpback whales past Cape Vidal, South Africa, and an estimate of the population increase rate (1988-2002). *African Journal of Marine Science*, 33(3): 375-392.
- Grimm, A.M. and Reason, C.J.C. 2011. Does the South American Monsoon influence African rainfall? *Journal of Climate*, 24: 1226-1238.
- Hall, C. and Lutjeharms, J.R.E. 2011. Cyclonic eddies identified in the Cape Basin of the South Atlantic Ocean. *Journal of Marine Systems*, 85: 1-10.
- Hirata, I., Hardman-Mountford, N., Berwin, R.J.W. and Barlow, R. 2011. Synoptic relationships between surface Chlorophyll-a and diagnostic pigments specific to phytoplankton functional types. *Biogeosciences*, 8: 331-327.
- Jackson, J.M., Allen, S.E., McLaughlin, F., Woodgate, R.A. and Carmack, E. 2011. Changes to the near-surface waters in the Canada Basin, Arctic Ocean from 1993-2009: A basin in transition. *Journal of Geophysical Research-Oceans*, 116: C10008. (21pp).
- Joubert, W., Thomalla, S., Waldron, H.N., Lucas, M.I., Boye, M., Le Moigne, F., Planchon, F. and Speich, S. 2011. Nitrogen uptake by phytoplankton in the Atlantic sector of the Southern Ocean during late austral summer. *Biogeosciences*, 8: 2947-2959.
- Lucas, M.I. and Rouault, M. 2011. Scorched, frozen or flooded! What's happening to the weather? *Quest*, 7(1): 38-40.
- Manatsa, D., Nyakudya, I.W., Mukwada, G. and Matsikwa, H. 2011. Maize yield forecasting for Zimbabwe farming sectors using satellite rainfall estimates. *Natural Hazards*, 59(1): 447-463.
- Manatsa, D., Matarira, H.T. and Mukwada, G. 2011. Relative impacts of ENSO and Indian Ocean dipole/zonal mode on east SADC rainfall. *International Journal of Climatology*, 31: 558-577.
- Manhique, A., Reason, C.J.C., Rydberg, L. and Fauchereau, N. 2011. ENSO and Indian Ocean sea surface temperatures and their relationships with tropical temperate troughs over Mozambique and the Southwest Indian Ocean. *International Journal of Climatology*, 31: 1-13.
- Matthews, M. 2011. A current review of empirical procedures of remote sensing in inland and near-coastal transitional waters. *International Journal of Remote Sensing*, 32(21): 6855-6899.
- McIntyre, T., Ansorge, I.J., Bornemann, H., Plötz, J., Tosh, C. and Bester, U. 2011. Elephant seal dive behaviour is influenced by ocean temperature: implications for climate change impacts on an ocean predator. *Marine Ecology Progress Series*, 441: 257-272.
- McLaughlin, F., Carmack, E., Proshutinsky, A., Krishfield, R.A., Guay, C., Yamamoto-Kawai, M., Jackson, J.M. and Williams, B. 2011. The rapid response of the Canada Basin to climate forcing: from bellwether to alarm bells. *Oceanography*, 24(3): 146-148.
- Monteiro, P.M.S., Dewitte, B., Scranton, M.I., Paulmier, A. and van der Plas, A.K. 2011. The role of open ocean boundary forcing on seasonal to decadal-scale variability and long-term change of natural shelf hypoxia. *Environmental Research Letters*, 6: 025002. (18pp).
- Naqvi, S.W.A., Bange, H.W., Farias, L., Monteiro, P.M.S., Scranton, M.I. and Zhang, J. 2010. Marine hypoxia/anoxia as a source of CH₄ and N₂O. *Biogeosciences*, 7: 2159-2190.
- Photopoulou, T., Best, P.B., Hammond, P.S. and Findlay, K.P. 2011. Movement patterns of coastal bottlenose dolphins in the presence of a fast-flowing, prevailing current: shore-based observations at Cape Vidal, South Africa. *African Journal of Marine Science*, 33(3): 393-401.
- Rouault, M.J. and Penven, P. 2011. New perspectives on Natal Pulses from satellite observations. *Journal of Geophysical Research-Oceans*, 116: C07013. (14pp).
- Sankar, S., Kumar, M.R.R. and Reason, C.J.C. 2011. On the relative roles of El Niño and Indian Ocean Dipole events on the Monsoon Onset over Kerala. *Theoretical and Applied Climatology*, 103: 359-374.

Shillington, F.A. 2011. Johann Lutjeharms: Oceanographer (1944-2011). *South African Journal of Science*, 107(9/10): 8-9.

Tagliabue, A. and Völker, C. 2011. Towards accounting for dissolved iron speciation in global ocean models. *Biogeosciences*, 8(10): 3025-3039.

Thomalla, S., Waldron, H.N., Lucas, M.I., Read, J.F., Ansoorge, I.J. and Pakhomov, E.A. 2011. Phytoplankton distribution and nitrogen dynamics in the southwest Indian subtropical gyre and Southern Ocean waters. *Ocean Science*, 7(1): 113-127.

Thomalla, S., Fauchereau, N., Swart, S. and Monteiro, P. 2011. Regional scale characteristics of the seasonal cycle of chlorophyll in the Southern Ocean. *Biogeosciences*, 8: 2849-2866.

Williams, R., Hedley, S.L., Branch, T.A., Bravington, M.V., Zerbini, A.N. and Findlay, K.P. 2011. Chilean Blue Whales as a case study to illustrate methods to estimate abundance and evaluate conservation status of rare species. *Conservation Biology*, 25(3): 526-535.

Williamson, R., Field, J.G., Shillington, F.A., Jarre, A. and Potgieter, A. 2011. A Bayesian approach for estimating vertical chlorophyll profiles from satellite remote sensing: proof-of-concept. *ICES Journal of Marine Science*, 68(4): 792-799.

Peer-reviewed published conference proceedings

Blamey, R.C. and Reason, C.J.C. 2011. The contribution of mesoscale convective complexes to southern African summer rainfall. In S. Venkataraman (ed.), 27th Annual SASAS Conference Proceeding 2011. Interdependent Atmosphere, Land and Ocean, 22-23 September 2011, Pretoria. Pretoria: South African Society for Atmospheric Sciences (SASAS). ISBN 9780620508490.

Collins, C., Reason, C.J.C. and Hermes, J.C. 2011. Comparison of different wind products over the western Indian Ocean. In S. Venkataraman (ed.), 27th Annual SASAS Conference Proceeding 2011. Interdependent Atmosphere, Land and Ocean, 22-23 September 2011, Pretoria. Pretoria: South African Society for Atmospheric Sciences (SASAS). ISBN 9780620508490.

Hart, N., Reason, C.J.C., Fauchereau, N. and Tadross, M.A. 2011. How does ENSO modify synoptic rainfall during summer? In S. Venkataraman (ed.), 27th Annual SASAS Conference Proceeding 2011. Interdependent Atmosphere, Land and Ocean, 22-23 September 2011, Pretoria. Pretoria: South African Society for Atmospheric Sciences (SASAS). ISBN 9780620508490.

Kuyper, B., Palmer, C., Labuschangne, C. and Reason, C.J.C. 2011. Modeling global methyl iodide production.

In S. Venkataraman (ed.), 27th Annual SASAS Conference Proceeding 2011. Interdependent Atmosphere, Land and Ocean, 22-23 September 2011, Pretoria. Pretoria: South African Society for Atmospheric Sciences (SASAS). ISBN 9780620508490.

DEPARTMENT OF PHYSICS

Including the Centre for Theoretical and Mathematical Physics, the NanoSciences Innovation Centre and the UCT-CERN Research Centre

HEAD OF DEPARTMENT: PROFESSOR D G ASCHMAN

DEPARTMENTAL PROFILE

The Department of Physics is accommodated in the R W James Building, which houses research laboratories equipped for nuclear physics, X-ray stress determination, computational physics and nanoelectronics production. Additional facilities available to the Department are provided within the building by the Electron Microscope Unit (Scanning Electron Microscope and Transmission Electron Microscope), and at iThemba LABS (200 MeV cyclotron, a 5 MeV Van de Graaff accelerator used for ion beam analysis, including a nuclear microprobe, high resolution X-ray diffraction, and PET scanners adapted for positron emission particle tracking).

Major areas of interest include:

Experimental nuclear physics at iThemba LABS (D G Aschman, A Buffler, R W Fearick, M R Nchodu): (a) Gamma ray spectroscopy with the AFRODITE array; (b) Giant resonance reactions with the magnetic spectrometer; (c) Fast neutron physics

Theoretical Physics (J W A Cleymans, C A Dominguez, W A Horowitz, A Peshier, S M Perez, H W G Weigert, S M Wheaton and R D Viollier): (a) Research within the Centre for Theoretical and Mathematical Physics; (b) Structure of elementary particles; (c) Weak interactions; (d) Quantum Electrodynamics and Chromodynamics in vacuum at extreme temperatures and densities; (e) Renormalization group equations (Color Glass Condensate); (f) Nonlinear effects in QCD at high densities; (g) Phenomenology of heavy ion reactions; (h) Quark gluon plasma; (i) Nuclear structure and models

Experimental high energy physics (J W A Cleymans, R W Fearick, A Hamilton): (a) Research within the UCT-CERN Research Centre; (b) Relativistic heavy ion collisions within the ALICE collaboration at CERN; (c) High energy proton-proton collisions within the ATLAS collaboration at CERN

Nanophysics and solid state physics (M D Blumenthal, D T Britton, C M Comrie and M Härting): (a) Research within the Nanosciences Innovation Centre; (b) Structural and electrical properties of thin films; (c) X-ray diffraction

studies of strain fields and residual stress analysis; (d) Single electron transport and interactions Applied Physics (A Buffler, I Govender, M R Nchodu, S W Peterson, S M Wheaton): (a) Positron Emission Particle Tracking at PEPT Cape Town, iThemba LABS; (b) Particulate flow and interaction characterization in engineering and biological systems by computational and mechanistic modelling; (c) Radiation transport modelling in industrial and medical systems; (d) Applied nuclear physics using neutrons; (e) Geo-neutrino detection (EARTH collaboration) Tertiary physics education (M S Allie, A Buffler and D Taylor): (a) Curriculum design and evaluation; (b) Role of language; (c) Understanding of measurement and uncertainty; (d) Modelling and visualization

DEPARTMENTAL STATISTICS

Permanent and Long Term Contract Staff

Professor	3
Associate Professor	7
Senior Lecturer	2
Lecturer	5
Part-time Lecturer	1
Technical Staff	4
Administrative Staff	4
Departmental & Lab Assistants	4
TOTAL	30

Research Staff

Emeritus Professor	5
Emeritus Associate Professor	1
Senior Research Associate	1
TOTAL	7

Students

Doctoral	16
Master's	18
Honours	6
Undergraduate	1680
TOTAL	1720

RESEARCH FIELDS AND STAFF

Permanent Staff

PROFESSOR D.G. ASCHMAN

Head of Department; Experimental Nuclear Physics.

PROFESSOR D.T. BRITTON

Solid State Physics.

PROFESSOR A. PESHIER

Theoretical Physics.

ASSOCIATE PROFESSOR M.S. ALLIE* (CHED)

Experimental Nuclear Physics; Physics Education.

ASSOCIATE PROFESSOR M.D. BLUMENTHAL

Solid State Physics.

ASSOCIATE PROFESSOR A. BUFFLER

Experimental Nuclear Physics. Physics Education.

ASSOCIATE PROFESSOR C.M. COMRIE

Solid State Physics.

ASSOCIATE PROFESSOR R.W. FEARICK

Experimental Nuclear Physics.

ASSOCIATE PROFESSOR M. HÄRTING

Solid State Physics.

ASSOCIATE PROFESSOR H.W.G. WEIGERT

Theoretical Physics.

DR I. GOVENDER

Senior Lecturer; Applied Physics.

DR S.M. WHEATON

Senior Lecturer; Theoretical Physics.

DR A. HAMILTON

Lecturer; Experimental Particle Physics.

DR W.A. HOROWITZ

Lecturer; Theoretical Particle Physics.

DR M.R. NCHODU

Lecturer; Experimental Nuclear Physics, Physics Education.

DR S.W. PETERSON

Lecturer; Experimental Nuclear Physics.

MS D. TAYLOR

Lecturer; Physics Education.

MR G. LEIGH

Part-time Lecturer.

Research Staff

EMERITUS PROFESSOR F.D. BROOKS

Experimental Nuclear Physics.

EMERITUS PROFESSOR J.W.A. CLEYMANS

Senior Research Associate; Theoretical Physics.

EMERITUS PROFESSOR C.A. DOMINGUEZ

Theoretical Particle Physics.

PROFESSOR F.E. LUBBEN

Physics Education.

EMERITUS PROFESSOR S.M. PEREZ

Theoretical Nuclear Physics.

EMERITUS ASSOCIATE PROFESSOR P. SPARGO

History of Science.

EMERITUS PROFESSOR R.D. VIOLLIER

Theoretical Particle Physics and Astrophysics.

DR G.B. TUPPER

Theoretical Physics and Applied Physics.

Distinguished Visitors

PROFESSOR M. LOEWE

Pontifical Catholic University of Chile

PROFESSOR H. FALOMIR

University of La Plata, Argentina

DR O. ZIMMER

Institute Laue-Langevin, France

PROFESSOR J. PENARROCHA

University of Valencia, Spain

PROFESSOR S. BUCKMAN

Australian National University, Australia

PROFESSOR K. ZUBER

Technical University Dresden, Germany

PROFESSOR H. FRITZSCH

LM University Munich, Germany

PROFESSOR D. WOLFE

University of New Mexico, US

DR Y. YAMAN

Bilkent University, Turkey

PROFESSOR K. SCHILCHER

University of Mainz, Germany

DR R. NEWMAN

iThemba LABS

PROFESSOR I. TSERRUYA

Weizmann Institute, Israel

DR J. PIERRUS

University of Kwa-Zulu Natal

PROFESSOR S. SEIDEL

University of New Mexico, US

PROFESSOR M. FETEA

University of Richmond, US

DR T. VICKEY

University of Witwatersrand

DR A. CORNELL

University of Witwatersrand

PROFESSOR G. BEAUCAGE

University of Cincinnati, US

PROFESSOR K. AMOS

University of Melbourne, Australia

DR S. PEIGNE

SUBATECH, Nantes, France

DR D. DEMAREE

University of Oregon, US

DR P. SOLOMON

IBM Research Centre New York, US

PROFESSOR J. ELLIS

CERN, Switzerland

PROFESSOR F. DOENAU

Helmholtz Centre Rossendorf, Germany

PROFESSOR A. ZEILINGER

University of Vienna, Austria

PROFESSOR H. LEWANDOWSKI

University of Colorado, US

PROFESSOR R. STOCK

University of Frankfurt, Germany

PROFESSOR R. MANN

University of Waterloo, Canada

DR D. PARKER

University of Birmingham, UK

CONTACT DETAILS

Postal address: Department of Physics, University of Cape Town, Private Bag X3, Rondebosch 7700

Telephone: +27 (21) 650-3326

Fax: +27 (21) 650-3342/3

Email: Margaret.Maich@uct.ac.za

Webpage: www.phy.uct.ac.za

RESEARCH OUTPUT

Articles in Peer-reviewed Journals

Aamodt, K., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Aglieri Rinella, G., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Centrality dependence of the charged-particle multiplicity density at midrapidity in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. *Physical Review Letters*, 106: 032301-1 to 032301-10.

Aamodt, K., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Aglieri Rinella, G., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Femtoscopy of pp collisions at $\sqrt{s} = 0.9$ and 7 TeV at the LHC with two-pion Bose-Einstein correlations. *Physical Review D*, 84: 112004-1 to 112004-22.

Aamodt, K., Abelev, B.I., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Higher harmonic anisotropic flow measurements of charged particles in Pb-Pb collisions at $\sqrt{s_{NN}} = 2,76$ TeV. *Physical Review Letters*, 107: 032301-1 to 032301-9.

Aamodt, K., Abel, N., Abeyssekara, U., Abrahantes Quintana, A., Abramyan, A., Adamova, D., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Production of pions, kaons and protons in pp collisions at $\sqrt{s} = 900$ GeV with ALICE at the LHC. *European Physical Journal C*, 71: 1-22.

Aamodt, K., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Aglieri Rinella, G., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Rapidity and transverse momentum dependence of inclusive J/ψ production in pp collisions at $\sqrt{s} = 7$ TeV. *Physics Letters B*, 704(5): 442-455.

Aamodt, K., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Aglieri Rinella, G., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Strange particle production in proton-proton collisions at $\sqrt{s} = 0.9$ TeV at the LHC. *European Physical Journal C*, 71: 1-24.

Aamodt, K., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Aglieri Rinella, G., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Suppression of charged particle production at large transverse momentum in central Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. *Physics Letters B*, 696(1-2): 30-39.

Aamodt, K., Abrahantes Quintana, A., Adamova, D., Adare, A.M., Aggarwal, M.M., Aglieri Rinella, G., Cleymans, J.W.A., Fearick, R.W. and ALICE Collaboration. 2011. Two-pion Bose-Einstein correlations in central Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. *Physics Letters B*, 696(4): 328-337.

Ayala, A., Bashir, A., Dominguez, C.A., Gutierrez, E., Loewe, M. and Raya, A. 2011. QCD phase diagram from finite energy sum rules. *Physical Review D*, 84: 056004. (7pp).

Bbosa, L.S., Govender, I., Mainza, A.N. and Powell, M.S. 2011. Power draw estimations in experimental tumbling mills using PEPT. *Minerals Engineering*, 24: 319-324.

Bodenstein, S., Bordes, J., Dominguez, C.A., Penarrocha, J. and Schilcher, K. 2011. QCD sum rule determination of the charm-quark mass. *Physical Review D*, 83: 074014. (4pp).

Blaschke, D., Berdermann, J., Cleymans, J.W.A. and Redlich, K. 2011. Chiral condensate and chemical freeze-out. *Physics of Particles and Nuclei Letters*, Letters vol 8(8): 811-817.

Buck, B., Merchant, A. and Perez, S.M. 2011. Generation of excited K bands in heavy nuclei. *Physical Review C*, 84: 034310. (9pp).

Cleymans, J.W.A. 2011. Maximum net baryon density in the energy region covered by NICA. *Physics of Particles and Nuclei Letters*, Letters vol 8(8): 1-4.

Cleymans, J.W.A., Kabana, S., Kraus, I., Redlich, K. and Sharma, N. 2011. Antimatter production in proton-proton and heavy-ion collisions at ultrarelativistic energies. *Physical Review C*, 84: 054916. (7pp).

Cleymans, J.W.A., Lykasov, G.I., Sorin, A.S. and Teryaev, O.V. 2011. Duality of dynamical and thermal descriptions in parton distribution functions. *Modern Physics Letters A*, 26(14): 1009-1016.

Cleymans, J.W.A. and Worku, D. 2011. The Hagedorn temperature revisited. *Modern Physics Letters A*, 26(16): 1197-1209.

Demeulemeester, J., Schrauwen, A., Nakatsuka, O., Zaima, S., Adachi, M., Shimura, Y., Comrie, C.M., Fleischmann, C., Detavernier, C., Temst, K. and Vantomme, A. 2011. Sn diffusion during Ni germanide growth on Ge_{1-x}Sn_x. *Applied Physics Letters*, 99: 211905. (3pp).

Dominguez, C.A., Loewe, M., Rojas, J.C. and Zhang, Y. 2011. (Pseudo)scalar charmonium in finite temperature QCD. *Physical Review D*, 83: 034033. (7pp).

Dominguez, C.A. 2011. Quark masses in QCD: a progress report. *Modern Physics Letters A*, 26(10): 691-710.

Gorbunov, S., Rohr, D., Aamodt, K., Alt, T., Appelshauser, H., Arend, A., Fearick, R.W., Vilakazi, Z.Z. and ALICE Collaboration. 2011. ALICE HLT high speed tracking on GPU. *IEEE Transactions on Nuclear Science*, 58(4): 1845-1851.

Govender, I., Mangesana, N., Mainza, A.N. and Franzidis, J.-P. 2011. Measurement of shear rates in a laboratory tumbling mill. *Minerals Engineering*, 24: 225-229.

Govender, I., Tupper, G.B. and Mainza, A.N. 2011. Towards a mechanistic model for slurry transport in tumbling mills. *Minerals Engineering*, 24(3-4): 230-235.

Horowitz, W.A. 2011. Qualitative and quantitative energy loss? *Nuclear Physics A*, 855: 225-228.

Horowitz, W.A. and Gyulassy, M. 2011. Quenching and tomography from the RHIC to the LHC. *Journal of Physics G-Nuclear and Particle Physics*, 38: 124114. (4pp).

Horowitz, W.A. and Kovchegov, Y.V. 2011. Running coupling corrections to high energy inclusive gluon production. *Nuclear Physics A*, 849: 72-97.

Horowitz, W.A. and Kovchegov, Y.V. 2011. Running coupling corrections to inclusive gluon productions. *Journal of Physics G-Nuclear and Particle Physics*, 38: 124064-1 -124064-4.

Horowitz, W.A. and Gyulassy, M. 2011. The surprisingly transparent sQGP at LHC. *Nuclear Physics A*, 872: 265-285.

Jayasundara, C.T., Yang, R.Y., Guo, B.Y., Yu, A.B., Govender, I., Mainza, A.N., Van der Westhuizen, A.P. and Rubenstein, J. 2011. CFD-DEM modelling of particle flow in IsaMills--Comparison between simulations and PEPT measurements. *Minerals Engineering*, 24(3-4): 181-187.

Jia, J., Horowitz, W.A. and Liao, J. 2011. Correlations between jet-quenching observables at energies available at the BNL Relativistic Heavy Ion Collider. *Physical Review C*, 84: 034904. (8pp).

Kallon, D., Govender, I. and Mainza, A.N. 2011. Circulation rate modelling of mill charge using position emission particle tracking. *Minerals Engineering*, 24(3-4): 282-289.

Neveling, R., Fujita, H., Smit, F.D., Adachi, T., Berg, G.P.A., Buthelezi, E.Z., Carter, J., Conradie, J.L., Couder, M., Fearick, R.W., Fortsch, S., Fourie, D.T., Fujita, Y., Gorres, J., Hatanaka, K., Jingo, M., Krumbholz, A.M., Kureba, C.O., Mira, J.P., Murray, S., von Neumann-Cosel, P., O'Brien, S., Papka, P., Poltoratska, I., Richter, A., Sideras-Haddad, E., Swartz, J.A., Tamii, A., Usman, I. and van Zyl, J.J. 2011. High energy-resolution zero-degree facility for light-ion scattering and reactions at iThemba LABS. *Nuclear Instruments & Methods in Physics Research Section A-Accelerators Spectrometers Detectors and Associated Equipment*, 654: 29-39.

Nsengiyumva, S., Riviere, J.P., Raji, A.T., Comrie, C.M., Britton, D.T. and Harting, M. 2011. Oxygen depth profiling

in Kr+-implanted polycrystalline alpha titanium by means of ^{16}O ^{16}O resonance scattering. *Journal of Nuclear Materials*, 414: 150-155.

Raji, A.T., Mazzarello, R., Scandolo, S., Harting, M. and Britton, D.T. 2011. Defects in ion-implanted hcp-titanium: A first-principles study of electronic structures. *Solid State Communications*, 151: 1889-1893.

Raji, A.T., Mazzarello, R., Scandolo, S., Nsengiyumva, S., Harting, M. and Britton, D.T. 2011. Intrinsic defects and krypton impurity atoms in hcp titanium: A first-principles study. *Physical Review B*, 83: 054120. (10pp).

Richter, A., Aamodt, K., Alt, T., Appelshauser, H., Arend, A., Becker, B., Bottger, S., Breitner, T., Busching, H., Cleymans, J.W.A. and Fearick, R.W. 2011. Event reconstruction performance of the ALICE high level trigger for p+p collisions. *IEEE Transactions on Nuclear Science*, 58(4): 1706-1712.

Robertson, D., Polf, J.C., Peterson, S., Gillin, M.T. and Beddar, S. 2011. Material efficiency studies for a Compton camera designed to measure characteristic prompt gamma rays emitted during protein beam radiotherapy. *Physics in Medicine and Biology*, 56: 3047-3059.

Scriba, M.R., Britton, D.T. and Harting, M. 2011. Electrically active, doped monocrystalline silicon nanoparticles produced by hot wire thermal catalytic pyrolysis. *Thin Solid Films*, 519: 4491-4494.

Sichalwe, K., Govender, I. and Mainza, A.N. 2011. Characterising porosity of multi-component mixtures in rotary mills. *Minerals Engineering*, 24(3-4): 276-281.

Smeets, D., Johnson, B.C., McCallum, J.C. and Comrie, C.M. 2011. Real-time in situ study of hydrogen diffusion in amorphous Si formed by ion implantation. *Nuclear Instruments & Methods in Physics Research Section B-Beam Interactions with Materials and Atoms*, 269(22): 2657-2661.

Stranex, T. and Wheaton, S. 2011. A new corrective scheme for SPH. *Computer Methods in Applied Mechanics and Engineering*, 200: 392-402.

Usman, I., Buthelezi, E.Z., Carter, J., Cooper, G.R.J., Fearick, R.W., Fortsch, S., Fujita, H., Fujita, Y., Kalmykov, Y., von Neumann-Cosel, P., Neveling, R., Papaconstantinou, P., Richter, A., Roth, R., Shevchenko, A., Sideras-Haddad, E. and Smit, F.D. 2011. Fine structure of the isoscalar giant quadrupole resonance in ^{40}Ca due to Landau damping? *Physics Letters B*, 698(3): 191-195.

Usman, I., Buthelezi, E.Z., Carter, J., Cooper, G.R.J., Fearick, R.W., Fortsch, S., Fujita, H., Kalmykov, Y., von Neumann-Cosel, P., Neveling, R., Poltoratska, I., Richter,

A., Shevchenko, A., Sideras-Haddad, E., Smid, F.D. and Warmbach, J. 2011. Level density of 2+ states in 40Ca from high-energy-resolution (p,p) experiments. *Physical Review C*, 84: 054322. (7pp).

Van der Westhuizen, A.P., Govender, I., Mainza, A.N. and Rubenstein, J. 2011. Tracking the motion of media particles inside an IsaMill™ using PEPT. *Minerals Engineering*, 24: 195-204.

Volkwyn, T.S., Buffler, A., Govender, I., Franzidis, J.-P., Morrison, A., Odo, A., van der Meulen, N.P. and Vermeulen, C. 2011. Studies of the effect of tracer activity on time-averaged positron emission particle tracking measurements on tumbling mills at PEPT Cape Town. *Minerals Engineering*, 24: 261-266.

Wheaton, S. and Hauer, M. 2011. Recent applications of Thermus, *Physics of Particles and Nuclei Letters*, 8(8): 869-873.

Peer-reviewed published conference proceedings

Dominguez, C.A. 2011. Electromagnetic Form Factors of Hadrons in Dual-Large Nc QCD. In A. Ayala, G. Contreras, I. Leon and P. Podestra (eds), *Proceedings of XII Mexican Workshop on Particles and Fields*, 9-14 November 2009, Moztatlan, Mexico. New York: American Institute of Physics. ISBN 978-0-7354-0919-4.

Dominguez, C.A. 2011. The operator product expansion beyond perturbation theory in QCD. In A. Ayala, G. Contreras, I. Leon and P. Podestra (eds), *Proceedings of XII Mexican Workshop on Particles and Fields*, 9-14 November 2009, Moztatlan, Mexico. New York: American Institute of Physics. ISBN 978-0-7354-0919-4.

DEPARTMENT OF STATISTICAL SCIENCES

HEAD OF DEPARTMENT: ASSOCIATE PROFESSOR CHRISTIEN THIART

DEPARTMENTAL PROFILE

Statistical sciences are defined to include the traditional concepts of statistics as well as allied areas such as operation management research and decision modeling. The department is located academically in both the Faculties of Science and Commerce. Research within the department covers econometrics and financial modeling, biodiversity modelling, mathematical and theoretical statistics, operational research, reliability and geostatistics.

DEPARTMENTAL STATISTICS

Permanent and long-term contract staff

Professors	6
Associate Professors	3
Senior Lecturers	4
Lecturers	10
Emeritus Professor	2
Emeritus Associate Professor	1
Administrative and Clerical Staff	6
Total	32

Students

Doctoral	8
Master's	13
Postgraduate service courses	138
Honours	15
Undergraduate	4366
Total	4540

RESEARCH FIELDS AND STAFF

Permanent staff

PROFESSOR TIM DUNNE

Generalized linear models; statistical methods in education and psychology.

ASSOCIATE PROFESSOR CHRISTIEN THIART

Head of Department; GIS and spatial modeling; mixed linear models.

PROFESSOR GRAHAM BARR

Econometrics and economic forecasting; financial modeling; problem gambling analysis

PROFESSOR DAVE BRADFIELD

Financial modelling.

PROFESSOR RENKUAN GUO

Reliability and quality; imprecise spatial analysis.

PROFESSOR LINDA HAINES

Optimal experimental design; extreme value theory; modelling count data; time series.

PROFESSOR LES UNDERHILL

Director, Animal Demography Unit; Director, South African Bird Ringing Unit (SAFRING); multivariate analysis; multidimensional scaling and related graphical display methods; ecological applications of statistics.

EMERITUS PROFESSOR THEODOR STEWART

Multicriteria decision analysis and multiobjective optimization; resource allocation and management.

EMERITUS PROFESSOR CAS TROSKIE

Multivariate regression.

ASSOCIATE PROFESSOR FRANCESCA LITTLE

Statistical methods in medicine; biology; generalized linear and nonlinear mixed effect models.

ASSOCIATE PROFESSOR SUGNET LUBBE

Multivariate statistics; Graphical displays; Biplots.

EMERITUS ASSOCIATE PROFESSOR JUNE JURITZ

Biostatistics, hierarchical generalised mixed models.

DR BIRGIT ERNI

Senior Lecturer; environmetrics; biometrics; generalized linear models; spatial statistics.

DR JUWA NYIRENDA

Senior Lecturer; operations research, management studies.

DR LEANNE SCOTT

Senior Lecturer; decision analysis; statistical methods in the social sciences and local government; operations research in developing countries.

MR KARL STIELAU

Senior Lecturer; sampling, ecological statistics and probability models.

MR ALLAN CLARK

Lecturer; Bayesian analysis; Extreme value theory; Econometric modelling.

MR GREG DISTILLER

Lecturer, biostatistics; statistical ecology.

MR IAN DURBACH

Lecturer; decision analysis.

DR FREEDOM GUMEDZE

Lecturer; biostatistics; mixed linear models.

MR DOMINIQUE KATSHUNGA

Lecturer; multivariate analysis; financial modelling.

MISS KERRY LEASK

Lecturer; generalized linear; nonlinear modelling; biostatistics.

MR MIGUEL LACERDA

Lecturer; bioinformatics; stochastic processes.

MISS KUTLWANO RAMABOA

Lecturer; multivariate analysis, data mining and statistical methods in education.

MR MELVIN VARUGHESE

Lecturer; ecological modelling, statistical analysis of cosmological data.

MRS LIDA ZACNA

Lecturer; educational applications.

CONTACT DETAILS

Postal address: Department of Statistical Sciences, University of Cape Town, Private Bag X3, Rondebosch, 7701

Telephone: +27 21 650 3219

Fax: +27 21 650 4773

Web: <http://www.uct.ac.za/depts/stats/>

UCT General enquiries: +27 21 650 9111

UCT web: <http://www.uct.ac.za>

RESEARCH OUTPUT

Authored books

Gower, J., Lubbe, S. and le Roux, N.J. 2011. Understanding Biplots. England: John Wiley and Sons, Ltd. 448pp. ISBN 978-0-470-01255-0.

Chapters in books

Guo, D., Guo, R., Cui, Y., Midgley, G.F., Altwegg, R. and Thiart, C. 2011. Climate change impact on quiver trees in arid Namibia and South Africa. In J. Blanco and H. Kheradmand (eds), Climate Change - Geophysical Foundations and Ecological Effects, pp. 323-342. Croatia: Open Access Publisher. ISBN 9789533074191.

Guo, D., Guo, R., Thiart, C. and Cui, Y. 2011. Imprecise uncertainty modelling of air pollutant PM10. In F. Nejadkoorki (ed.), *Advanced Air Pollution*, pp. 193-212. Croatia: Open Access Publisher. ISBN 9789533075112.

Articles in Peer-reviewed Journals

Barr, G.D.I. and Dowie, K. 2011. Swivelling probabilities - the winning hand at poker. *American Statistician*, 65(3): 170-176.

Barr, G.D.I. and Scott, L.D. 2011. Teaching statistics in a Spreadsheet Environment Using Simulation. *Spreadsheets in Education*, 4(3): 1-18.

Coetzer, R.L.J., Haines, L.M. and Fatti, L.P. 2011. Central composite designs for estimating the optimum conditions for a second-order model. *Journal of Statistical Planning and Inference*, 141(5): 1764-1773.

Collins, P., Stein, D.J., Pretorius, A., Sinclair, H., Ross, D.A., Barr, G.D.I., Hofmeyr, A.K., Sharp, C., Spurrett, D., Rousseau, J., Ainslie, G., Dellis, A., Kincaid, H. and Bak, N. 2011. Addressing problem gambling: South Africa's National Responsible Gambling Programme. *SAMJ South African Medical Journal*, 101(10): 722-723.

Cui, Y., Guo, R., Dunne, T.T. and Guo, D. 2011. Bayesian Uncertainty Decision Analysis. *Reliability: Theory & Applications*, 2(1): 70-81.

Debushe, L.K. and Haines, L.M. 2011. D- and V-optimal population designs for the quadratic regression model with a random intercept term. *Journal of Statistical Planning and Inference*, 141(2): 889-898.

Dunne, T.T. 2011. Road maps for learning: a bird's eye view. *Measurement: Interdisciplinary Research & Perspective*, 9: 134-137.

Dunne, T.T. 2011. The role of the unit in physics and psychometrics: a commentary. *Measurement: Interdisciplinary Research & Perspective*, 9: 36-39.

Durbach, I.N. and Stewart, T.J. 2011. an experimental study of the effect of uncertainty representation on decision making. *European Journal of Operational Research*, 214: 380-392.

Gumedze, F.N. and Jackson, D. 2011. A random effects variance shift model for detecting and accommodating outliers in meta-analysis. *Bmc Medical Research Methodology*, 11:19. (9pp).

Gumedze, F.N. and Dunne, T.T. 2011. Parameter estimation and inference in the linear mixed model. *Linear Algebra and its Applications*, 435: 1920-1944.

Guo, R., Guo, D. and Cui, Y. 2011. An uncertain regression model. *Grey Systems: Theory and Application*, 1(3): 202-215.

Guo, R., Guo, D. and Thiart, C. 2011. Hybrid poisson processes with fuzzy rate. *International Journal of Performability Engineering*, 7(1): 97-106.

Guo, R., Cui, Y., Thiart, C. and Guo, D. 2011. Hybrid reliability modeling with imprecise parameter. *Reliability: Theory & Applications*, 2(1): 82-95

Guo, R., Cui, Y. and Guo, D. 2011. Uncertainty linear regression models. *Journal of Uncertain Systems*, 5(4): 286-304.

Jaspan, H.B., Liebenberg, L., Hanekom, W.A., Burgers, W., Coetzee, D.J., Williamson, A.-L., Little, F., Myer, L., Coombs, R.W., Sodora, D. and Passmore, J.S. 2011. Immune Activation in Female Genital Tract During HIV Infection Predicts Mucosal Cd4 Depletion and HIV Shedding. *Journal of Infectious Diseases*, 204: 1550-1556.

Khumalo, N.P., Gumedze, F.N. and Lehloeny, R. 2011. Folliculitis keloidalis nuchae is associated with the risk for bleeding from haircuts. *International Journal of Dermatology*, 50: 1212-1216.

Kredo, T., Mauff, K., Van der Walt, J.-S., Wiesner, J., Maartens, G., Cohen, K., Smith, P.J. and Barnes, K.I. 2011. Interaction between Artemether-Lumefantrine and Nevirapine-Based Antiretroviral Therapy in HIV-1-Infected Patients. *Antimicrobial Agents and Chemotherapy*, 55(12): 5616-5623.

Lawn, S.D., Campbell, L., Kaplan, R., Little, F., Morrow, C.D. and Wood, R. 2011. Delays in starting antiretroviral therapy in patients with HIV-associated tuberculosis accessing non-integrated clinical services in a South African township. *BMC Infectious Diseases*, 11:258. (9pp).

Lawn, S.D., Campbell, L., Kaplan, R., Boule, A.M., Cornell, M., Kerschberger, B., Morrow, C.D., Little, F., Egger, M. and Wood, R. 2011. Time to initiation of Antiretroviral Therapy Among Patients with HIV-Associated Tuberculosis in Cape Town, South Africa. *Jacids-Journal of Acquired Immune Deficiency Syndromes*, 57(2): 136-140.

Letvin, N.L., Rao, S.S., Montefiori, D.C., Seaman, M.S., Sun, Y., Lim, S., Yeh, W.W., Asmal, M., Gelman, R.S., Shen, L., Whitney, J.B., Seoighe, C., Lacerda, M., Keating, S., Norris, P.J., Hudgens, M.G., Gilbert, P.B., Buzby, A.P., Mach, L.V., Zhang, J., Balachandran, H., Shaw, G.M., Schmidt, S.D., Todd, J.P., Dodson, A., Mascola, J.R. and Nabel, G.J. 2011. Immune and genetic correlates of vaccine protection against mucosal infection by siv in monkeys. *Science Translational Medicine*, 3:81.

Newling, J., Varughese, M., Bassett, B.A., Campbell, H., Hlozek, R., Kunz, M., Lampeitl, H., Martin, B., Nichol, R., Parkinson, D. and Smith, M. 2011. Statistical classification techniques for photometric supernova typing. *Monthly Notices of the Royal Astronomical Society*, 414: 105-112.

Ntusi, N., Badri, M., Gumedze, F.N., Wonkam, A. and Mayosi, B.M. 2011. Clinical characteristics and outcomes of familial and idiopathic dilated cardiomyopathy in Cape Town: A comparative study of 120 cases followed up over 14 years. *SAMJ South African Medical Journal*, 101(6): 399-404.

Raman, J., Mauff, K., Muianga, P., Mussa, A., Maharaj, R. and Barnes, K.I. 2011. Five Years of Antimalarial Resistance Marker Surveillance in Gaza Province, Mozambique, Following Artemisinin-Based Combination Therapy Roll Out. *PLoS One*, 6(10): 1-8.

Schultz, A., Underhill, L.G., Earle, R. and Underhill, G. 2011. Seasonality, distribution and taxonomic status of avian haemosporidian parasites within the Greater Cape Town area, South Africa. *Ostrich*, 82(2): 141-153.

Sher, G.M. and Barr, G.D.I. 2011. Portfolio rebalancing in South Africa. *SA Journal of Accounting Research*, 25(1): 59-80.

Scriba, T.J., Tameris, M.D., Mansoor, N., Smit, E., Van der Merwe, L., Mauff, K.A.L., Hughes, E.J., Moyo, S., Brittain, N., Lawrie, A., Mulenga, H., de Kock, M., Gelderbloem, S., Veldsman, A., Hatherill, M., Geldenhuys, H.D., Hill, A.V.S., Hussey, G.D., Mahomed, H., Hanekom, W.A. and McShane, H. 2011. Dose-Finding Study of the Novel Tuberculosis Vaccine, MVA85a, in Healthy BCG-Vaccinated Infants. *Journal of Infectious Diseases*, 203: 1832-1843.

Taylor, L., Kaminer, D.B. and Hardy, A. 2011. Risk factors for premature termination of treatment at a child and family mental health clinic. *Journal of Child and Adolescent Mental Health*, 23(2): 155-164.

Varughese, M. 2011. A framework for modelling ecological communities and their interactions with the environment. *Ecological Complexity*, 8: 105-112.

Peer-reviewed published conference proceedings

Cui, Y. and Guo, R. 2011. Lambda algorithm and maximum likelihood estimation. In K. Koowrocki, J. Soszyska and E. Zio (eds), *Proceedings of Summer Safety and Reliability Seminars, 20-26 June, Gsansk-Sopot, Poland*. Poland: Polish Safety and Reliability Association. ISBN 978-83-925436-2-6.

Cui, Y. and Guo, R. 2011. Lambda algorithm and Nash equilibrium numerical solution. In K. Hirota, D.A. Ralescu and J. Peng (eds), *Proceedings of the Second International*

Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China. Cincinatti, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Cui, Y. and Guo, R. 2011. Nash-lambda algorithm with applications in reliability and risk. In K. Koowrocki, J. Soszyska and E. Zio (eds), *Proceedings of Summer Safety and Reliability Seminars, 20-26 June, Gsansk-Sopot, Poland*. Poland: Polish Safety and Reliability Association. ISBN 978-83-925436-2-6.

Cui, Y., Guo, R. and Guo, D. 2011. Theory of algorithm. In Z. Guo, Y. Xiang-Qun, P. Jin and N. Yufu (eds), *Proceedings of Ninth China Annual Conference on Uncertainty, 27-31 July, 2011, Nanjing, China*. Hong Kong: Global-Link Publisher. ISBN 962-8286-65-2.

Dai, W., Guo, R., Guo, D. and Cui, Y. 2011. The autocorrelation of a standard uncertain canonical process. In K. Hirota, D.A. Ralescu and J. Peng (eds), *Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China*. Cincinatti, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, D., Guo, R. and Cui, Y. 2011. Application of uncertain canonical process in spatial predictions. In Z. Guo, Y. Xiang-Qun, P. Jin and N. Yufu (eds), *Proceedings of Ninth China Annual Conference on Uncertainty, 27-31 July, 2011, Nanjing, China*. Hong Kong: Global-Link Publisher. ISBN 962-8286-65-2.

Guo, D., Guo, R., Cui, Y., Midgley, G.F., Altwegg, R. and Thiart, C. 2011. Climate change impact on quiver trees in arid Namibia and South Africa. In K. Hirota, D.A. Ralescu and J. Peng (eds), *Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China*. Cincinatti, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, D., Guo, R., Thiart, C. and Cui, Y. 2011. Imprecise uncertainty modeling of air pollutant PM10. In K. Hirota, D.A. Ralescu and J. Peng (eds), *Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China*. Cincinatti, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, D., Guo, R., Cui, Y. and Dunne, T.T. 2011. The uncertain fractional canonical process regression. In K. Hirota, D.A. Ralescu and J. Peng (eds), *Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China*. Cincinatti, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, R., Cui, Y. and Guo, D. 2011. An uncertain regression model. In S. Liu (ed.), *Proceedings of the 2011 IEEE*

International Conference on Grey Systems and Intelligent Services, 15-18 September 2011, Nanjing, China. Piscataway, NJ: Institute of Electrical and Electronic Engineers. ISBN 978-1-61284-488-6.

Guo, R., Thiart, C., Cui, Y. and Guo, D. 2011. Lifetime distributions with wavelike bathtub hazard. In K. Koowrocki, J. Soszyska and E. Zio (eds), Proceedings of Summer Safety and Reliability Seminars, 20-26 June, Gsansk-Sopot, Poland. Poland: Polish Safety and Reliability Association. ISBN 978-83-925436-2-6.

Guo, R., Dai, W., Guo, D. and Cui, Y. 2011. The autocorrelation of an uncertain integral driven process. In K. Hirota, D.A. Ralescu and J. Peng (eds), Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China. Cincinnati, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, R., Dai, W., Guo, D., Cui, Y. and Dunne, T.T. 2011. The uncertain canonical process regression models. In K. Hirota, D.A. Ralescu and J. Peng (eds), Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China. Cincinnati, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, R., Cui, Y. and Guo, D. 2011. Uncertain canonical process driven models and data analysis. In Z. Guo, Y. Xiang-Qun, P. Jin and N. Yufu (eds), Proceedings of Ninth China Annual Conference on Uncertainty, 27-31 July, 2011, Nanjing, China. Hong Kong: Global-Link Publisher. ISBN 962-8286-65-2.

Guo, R., Guo, D. and Cui, Y. 2011. Uncertain DEAR models. In K. Hirota, D.A. Ralescu and J. Peng (eds), Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China. Cincinnati, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Guo, R., Guo, D., Cui, Y. and Dai, W. 2011. Uncertain temporal regression models. In K. Hirota, D.A. Ralescu and J. Peng (eds), Proceedings of the Second International Conference on Uncertainty Theory, 6-11 August 2011, Lhasa, Tibet, China. Cincinnati, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Ramaboa, K. and Underhill, L.G. 2011. Eigenvector cutoff value for collinear variables in multivariate data. In Proceedings of World Academy of Science, Engineering and Technology: WASET 2011 Winter International Conference, 25-27 January 2011, Dubai. Dubai: Thomson Reuters. ISSN 2010-3778.

DEPARTMENT OF ZOOLOGY

(Including the FitzPatrick Institute, DST/NRF Centre of Excellence, the Marine Research Institute and the Animal Demography Unit)

HEAD OF DEPARTMENT: PROFESSOR ANUSUYA CHINSAMY-TURAN

DEPARTMENT PROFILE

The Zoology Department houses the Marine Biology Research Centre (MBRC), the Percy FitzPatrick Institute, DST/NRF Centre of Excellence (PFIAO); the Freshwater Research Unit (FRU) and the Animal Demography Unit (ADU). Other smaller cogent groups co-ordinate research on mammals, palaeobiology, entomology and physiology. The Department hosts South African Research Chairs in Evolution and Systematics and in Marine Ecology and Fisheries. The Department has a large postgraduate school of some 130 master's and doctoral students and a significant portion of the research publications produced by UCT originate from Zoology.

Research interests of the MBRC include fisheries and coastal zone management, rocky shore ecology, seaweed and invertebrate biodiversity and systematics, the biology of the Benguela upwelling ecosystem, and biogeochemical cycles of the ocean, particularly of carbon and nitrogen, and how such cycles may be impacted by climate change. The PFIAO remains primarily involved in avian research, coupled with a strong emphasis on conservation biology. Research in the FRU focuses on the ecology of freshwater ecosystems, and on the conservation and management of rivers and wetlands. The Animal Demography Unit focuses on statistical ecology, with two strands of activities: a series of monitoring projects for birds, butterflies and reptiles, and a cohort of postgraduate students with statistics-rich research projects relating to various aspects of population dynamics. Other research in the department is centred around: the behaviour, ecology, physiology, systematics and evolutionary biology of a variety of small mammals (mole rats, golden moles, rodents, bats), seals and primates; palaeobiology and osteohistology, including factors that affect bone depositional rates in modern birds and reptiles and the biological signals recorded in fossil bones of non-mammalian therapsids, mammals, dinosaurs and other archosaurs; the systematics and biogeography of insects and insect ecology in arid ecosystems; biological control, especially the use of herbivorous insects to curb the seeding capacity and invasiveness of problematic Australian acacia species; and physiological studies on how small peptide hormones produced in nerve cells regulate energy metabolism, growth, development and reproduction in insects and crustaceans and how astaxanthin and chitin can be used in an economically viable way to deal with so-called waste products of the rock lobster industry.

DEPARTMENTAL STATISTICS

Permanent and Long-term Contract Staff

Professors	6
Associate Professors	7
Senior Lecturers	2
Lecturers	4
Research Staff	3
Librarian	1
Technical Support Staff	4
Scientific Officers	5
Administrative and Clerical Staff	8
Laboratory Assistants	2
Total	42

Honorary Staff

Research Associates	15
Emeritus Professors	3
Emeritus Associate Professors	2
Professors	3
Associate Professor	1
Total	23

Contract Staff

Research Assistants	6
----------------------------	----------

Students

Postdoctoral	26
Doctoral	53
Master's	86
Honours	9
Undergraduate	652
Total	826

RESEARCH FIELDS AND STAFF

Permanent Staff

ASSOCIATE PROFESSOR COLIN ATTWOOD

Marine protected areas; line fish population ecology.

DR JACQUI BISHOP

Lecturer. Evolutionary biology and conservation genetics.

DR GARY BRONNER

Senior Lecturer; systematics, ecology and conservation biology of African small mammals, with emphasis on endemic and threatened golden moles; Scientific Editor: African Zoology

PROFESSOR ANUSUYA CHINSAMY-TURAN

Head of Department. Palaeobiologist. Undertakes comparative bone and teeth histology of extant and extinct vertebrates (such as dinosaurs, Mesozoic birds, pterosaurs, nonmammalian therapsids, as well as, more recent Pliocene vertebrates).

ASSOCIATE PROFESSOR JENNY DAY

Director of the Freshwater Research Unit; freshwater ecology; bioassessment; crustaceans; wetlands, particularly temporary and saline waters; conservation and management of inland water ecosystems; water chemistry and water quality

PROFESSOR CHARLES GRIFFITHS

Director of the Marine Biology Research Centre; aquatic invasive alien species; biodiversity and endemism patterns of African marine fauna; coastal marine ecology; amphipod taxonomy

ASSOCIATE PROFESSOR JOHN HOFFMANN

Integrating biological control into the management of alien invasive weeds in South Africa

ASSOCIATE PROFESSOR DAVID JACOBS

DST & NRF Research Chair in Animal Evolution and Systematics. Evolutionary biology; behavioural ecology, systematics and evolutionary development; bats and other mammals

ASSOCIATE PROFESSOR ASTRID JARRE

DST & NRF Research Chair in Marine Ecology & Fisheries. Ecosystem modeling; ecosystem approach to fisheries management, collaboration between social and natural scientists

ASSOCIATE PROFESSOR MIKE LUCAS

Honorary Research Fellowship, National Oceanography Centre, Southampton, UK. UCT: biological oceanography; biogeochemical cycling; phytoplankton dynamics, carbon/nitrogen cycling and climate change. Research in the Benguela upwelling, North and South Atlantic and Southern Ocean ecosystems. South African Surface Ocean Lower Atmosphere Study (SOLAS) SSC

DR HEATHER MARCO

Lecturer; Neuropeptide purification/biochemistry; crustacean neuroendocrinology & physiology; insect neuroendocrinology; Convenor of second year Form and function (Ecophysiology) course. Alexander von Humboldt Foundation Research Fellow

ASSOCIATE PROFESSOR COLEEN MOLONEY

Plankton ecology; ecosystem dynamics; fisheries ecology; ecological modelling.

ASSOCIATE PROFESSOR JUSTIN O'RIAIN

Social mammals; behavioural ecology; vertebrate reproduction

ASSOCIATE PROFESSOR MIKE PICKER

Insect ecology; insect biodiversity

DR DEENA PILLAY

Awarded the UCT College of Fellows Younger Researcher Award for 2011

Lecturer; estuarine ecology; rocky-shore ecology; benthic ecology, biological interactions

DR CECILE C. REED

Lecturer; Aquatic Parasitology, freshwater ecology and conservation

DR JANE TURPIE

Resource economics, conservation planning, estuarine ornithology

PROFESSOR LES UNDERHILL

Director Animal Demography Unit. Interfaces statistics and biology, in applications of statistics in the biological sciences, particularly ornithology and ecology

Technical and Administrative Support Staff

George du Plessis – Chief Technical Officer

Granville Faulmann – Workshop/Departmental Assistant

Natalie Jodamus – SAP Administrator

Sue Kuyper – Administrator ADU

Shanaaz Manie – Administrative Officer

Petra Muller – Chief Technical Officer

Jo-Wayne Palmer – Senior Secretary

Liesl Phigeland – Senior Scientific Officer

Andrea Plos – Principal Technical Officer

Contract Research Staff

DR MARIENNE DE VILLIERS

SARCA Project Manager. Diversity and distribution of reptiles in South Africa, Lesotho and Swaziland.

MR DOUG HAREBOTTLE

SABAP2 Project Manager. Movement data for waterbirds in the African Eurasian flyway.

MS FIONA IMPSON

Development of insect agents for biological control of alien invasive plants.

MS CARIEN KLEINJAN

Evaluation of insect agents used for biological control of alien invasive plants.

MR ANDREW KNIGHT

Terrestrial conservation planning and natural resource management.

DR AMANDA LOMBARD

Marine and terrestrial conservation planning.

DR HEATHER MALAN

Aquatic pollution; water quality; wetlands, sustainable urban drainage.

DR SILVIA MECENERO

SABCA Project Coordinator. Southern African Butterfly conservation Assessment.

DR DIETER OSCHADLEUS

SAFRING Project Coordinator. African Weaver birds

DR L SHANNON

Ecosystem models, ecosystem approach to fishing.

MRS DONELLA YOUNG

CAR Project Coordinator. Coordinated Avifaunal Roadcounts; Long term monitoring of large terrestrial birds in agricultural landscapes

MR EDWARD HILL

EAF group GIS specialist

MRS GILLY SMITH

MBRC Research Officer

MR MARIUS WHEELER

CWAC and BIRP Project Coordinator. Long term monitoring of waterbirds and birds in protected areas

Emeritus Professors and Associate Professors

EMERITUS PROFESSOR GEORGE BRANCH

Rocky-shore ecology; estuarine and lagoonal ecology; invertebrate fisheries management; fisheries policy; subsistence fisheries; impacts of diamond-mining; coastal ecology

EMERITUS PROFESSOR GERD GÄDE

Invertebrates; isolation and characterisation of neuropeptides; intermediary metabolism; anaerobic metabolism; insect flight and its control by hormones; mode of action of invertebrate neuropeptide hormones; phylogeny; confirmation of expression of genome predicted neuropeptides by mass spectrometric methods; spectrometric methods; cloning of neuropeptide precursors and their cognate receptors

EMERITUS ASSOCIATE PROFESSOR BRYAN DAVIES

River ecology; ecosystem processes; ecological effects of dams and rivers; wetland ecology

EMERITUS PROFESSOR JOHN FIELD

Director Marine Research Institute

EMERITUS ASSOCIATE PROFESSOR JENNIFER JARVIS

Small and subterranean mammal ecophysiology and ethology

Honorary Professors

PROFESSOR DAVID CUMMINGS

Influence of land use policy and practice on biodiversity and resilience in social-ecological systems

PROFESSOR LARRY HUTCHINGS

Marine fisheries

PROFESSOR SUZANNE MILTON

Arid zone disturbance and rehabilitation ecology

Honorary research associates

DR RES ALTWEGG

Statistical ecology

DR LARA ATKINSON

DR PAUL BARHAM

Penguin survival

DR R BARLOW

DR BARRY CLARK

DR ROB CRAWFORD

Ecosystem approach to fisheries (as it relates to seabirds) and the conservation and suitable utilization of South Africa's seabirds

DR A COCKROFT

DR MARIENNE DE VILLIERS

SARCA Project Manager. Diversity and distribution of reptiles in South Africa, Lesotho and Swaziland.

DR DEON DURHOLTZ

Fish ageing, squid ageing, fisheries management

DR D Y GHEBREHWET

DR DAVID GRÉMILLET

Visiting Research Associate. Functional ecology of marine birds. Ecophysiology of marine birds facing global change; functional and evolutionary ecology; avian energetic; biotelemetry; impact of marine fisheries; polar ecosystems; Benguela upwelling ecosystem.

DR H J HAWKINS

DR JENNY HUGGETT

DR ALAN KEMP

Natural history, behavioural ecology and systematics of birds, especially hornbills, and diurnal and nocturnal raptors

DR SVEN KERWATH

DR R W LESLIE

EMERITUS PROFESSOR CLIFF MORAN

DR B PATERSON

DR GRANT PITCHER

DR JEAN-PAUL ROUX

Benguela system

DR T SAMAAI

DR CARL VAN DER LINGEN

Pelagic fish, fish feeding ecology, pelagic fisheries management

DR H VERHEYE

DR ROSS WANLESS

Seabird conservation; island restoration; invasive alien species; mitigation measures for avoiding seabird bycatch in fisheries; population biology and demography for conservation; seabird and insular ecology, remote tracking of seabirds at sea, marine protected areas and marine Important Bird Areas; genetics, taxonomy and conservation of the Aldabra Rail; conservation and ecological applications of stable light isotopes

DR INGRID WIESEL

DR TONY WILLIAMS

Seabird biology and conservation; the status and distribution of seabirds in Latin America; synanthropic ecology

Postdoctoral Fellows

DR LAURA BLAMEY

Coastal and fisheries ecology

DR FLORENT BLED

Dynamic macroecology in conservation

DR RUTLEDGE BOYES

Rarity & Conservation of African Birds

DR AURORE CANOVILLE

Palaeobiology of early tetrapods

DR SUSAN CUNNINGHAM

Sub-lethal Effects of Climate Change on Desert Birds

DR FITSUM GEBRESELASSIE

Integrated population modelling

DR ROMALA GOVENDER

Marine vertebrates from Langebaanweg

DR SANDRA JASINOSKI

Biomechanics and functional morphology of non-mammalian therapsid skulls

DR THOMAS LADO

Inquiline associations in fungal galls

DR DOUGLAS LOEWENTHAL

Oystercatcher Conservation Programme

DR KATRIN LUDYNIA

Namibian seabirds in the Benguela System

DR ROWAN MARTIN

Parrot biology and conservation

DR ANGELA MEAD

Marine biodiversity

DR FELIX NCHU

Veterinary parasitology

DR HILKKA NDJAULA

Modeling marine fisheries

DR GRAEME OATLEY

Phylogenetics and biogeography of the African white-eyes

DR LORIEN PICHEGRU

Marine Protected Areas for seabird foraging effort

DR TIMOTHY REID

Island Conservation & Seabird Research

DR RICHARD SHERLEY

Seabird biology

DR CLELIA SIRAMI

Landscape ecology of bats

DR ANTJE STEINFURTH

Factors influencing the ecology of the African Penguin

DR DANIEL THOMAS

Bone diagenesis of fossils from Western Cape localities

DR YASEMIN TULU

Assessment of fossil shark diversity at the Pliocene locality Langebaanweg

DR KIRSTEN WIMBERGER

Animal behaviour

DR HENNING WINKER

Assessment of Fish Stocks

Research affiliates**DR BRUCE PAXTON**

Freshwater fish ecology; environmental flows

DR GEORDIE RACTLIFFE

River and wetland impact assessment, management plans, rehabilitation and biomonitoring; Western Cape river systems; role of disturbance in invertebrate community structure

DR HELEN DALLAS

Water quality and bioassessment; development and validation of appropriate biomonitoring tools for river health monitoring, and aquatic biodiversity and conservation; development of the National River Health Programme; development of national water quality guidelines for aquatic ecosystems; effects of temperature on aquatic ecosystems

MS KATE SNADDON

Inter-basin transfer effects, identification of freshwater invertebrates, biomonitoring, management of rivers, environmental impact assessment, Ecological Reserve determination and the mapping and rehabilitation of urban rivers and wetlands

MS JUSTINE EWART-SMITH

Ecological Reserve Determination and rehabilitation of riverine systems, assessing the integrity of rivers and wetlands for Environmental Impact Assessments (EIAs); development of a wetland classification system

MS NANCY JOB

Wetlands (delineation, functional assessment and rating, mitigation, law and policy), land-use and zoning review, analysis of aerial photography, GIS and mapping. Assessment and classification of streams

MR DEAN OLLIS

Testing, use and development of 'tools' for the assessment of freshwater ecosystems. Management of water resources, and the incorporation of ecological assessment in Environmental Impact Assessment (EIA)

DR LIZ DAY

Aquatic ecology, specialising in urban river and wetland management and rehabilitation, impact assessments, situation assessments, biomonitoring, and specialist input into Catchment Management Plans

CONTACT DETAILS

Tel: +27 21 650 3603/4

Fax: +27 21 650 3301

E-mail: soraya.abrahams@uct.ac.za

Web: www.zoology.uct.ac.za

UCT General enquiries: +27 21 650 9111

UCT web: <http://www.uct.ac.za>

RESEARCH OUTPUT

Authored books

Cumming, G.S. 2011. Spatial Resilience in Social-Ecological Systems. Dordrecht: Dordrecht: Springer. 254pp. ISBN 9789400703070.

Picker, M. and Griffiths, C. 2011. Alien and Invasive Animals – A South African Perspective. Struik Nature. 240pp. ISBN 9781770078239

Chapters in books

Collier, J. and Cumming, G.S. 2011. A dynamical approach to ecosystem identity. In K. deLaplante, B. Brown and K.A. Peacock (eds), *Philosophy of Ecology*, pp. 3-431. Oxford: Elsevier Sci Ltd. ISBN 9780444516732.

Griffiths, C.L., Robinson, T.B. and Mead, A. 2011. Impacts of alien marine Crustacea in South Africa. In B. Galil, P.E. Clark and J.T. Carlton (eds), *In the Wrong Place: Alien Marine Crustacea – Distribution, Biology and Impacts*, pp. 269-282. Invasion Biology Series, Springer. ISBN 9789400705913

Guo, D., Guo, R., Cui, Y., Midgley, G.F., Altwegg, R. and Thiart, C. 2011. Climate change impact on quiver trees in arid Namibia and South Africa. In J. Blanco and H. Kheradmand (eds), *Climate Change - Geophysical Foundations and Ecological Effects*, pp. 323-342. Croatia: Open Access Publisher. ISBN 9789533074191.

Articles in Peer-reviewed Journals

Allen, C.R., Cumming, G.S., Garmestani, A.S., Taylor, P.D. and Walker, B.H. 2011. Managing for resilience. *Wildlife Biology*, 17: 337-349.

Altwegg, R., Donnelly, R.E., Katzner, T., Gordon, I.J., Gompfer, M.E., Redpath, S., Garner, T.W.J. and Reed, D.H. 2011. Putting the eco back in ecotourism. *Animal Conservation*, 14(4): 325-327.

Amar, A., Grant, M., Buchanan, G.M., Sim, I., Wilson, J., Pearce-Higgins, J.W. and Redpath, S. 2011. Exploring the relationships between wader declines and current land-use in the British uplands. *Bird Study*, 58: 13.

Amar, A., Davies, J., Meek, E., Williams, J., Knight, A. and Redpath, S. 2011. Long-term impact of changes in sheep *Ovis aries* densities on the breeding output of the hen harrier *Circus cyaneus*. *Journal of Applied Ecology*, 48: 220-227.

Angelini, R. and Vaz-Velho, F. 2011. Ecosystem structure and trophic analysis of Angolan fishery landings. *Scientia Marina*, 75: 309-319.

Atkinson, L., Leslie, R.W., Field, J.G. and Jarre, A.C. 2011. Changes in demersal fish assemblages on the west coast of South Africa, 1986-2009. *African Journal of Marine Science*, 33(1): 157-170.

Atkinson, L., Field, J. and Hutchings, L. 2011. Effects of demersal trawling along the west coast of southern Africa: multivariate analysis of benthic assemblages. *Marine Ecology-Progress Series*, 430: 241-255.

Attwood, C.G., Petersen, S.L. and Kerwath, S.E. 2011. Bycatch in South Africa's inshore trawl fishery as determined from observer records. *ICES Journal of Marine Science*, 68(10): 2163-2174.

Barclay, R.M.R. and Jacobs, D.S. 2011. Differences in the foraging behaviour of male and female Egyptian fruit bats (*Rousettus aegyptiacus*). *Canadian Journal of Zoology- Revue Canadienne de Zoologie*, 89: 466-473.

Barshep, Y., Hedenstrom, A. and Underhill, L.G. 2011. Impact of climate and predation on autumn migration of the Curlew Sandpiper. *Waterbirds*, 34(1): 1-9.

Barshep, Y., Minton, C., Underhill, L.G. and Remisiewicz, M. 2011. The primary moult of Curlew Sandpipers *Calidris ferruginae* in North-western Australia shifts according to breeding success. *Ardea*, 99(1): 43-51.

Birkhead, T.R., Hemmings, N., Spottiswoode, C.N., Mikulica, O., Moskat, C., Bán, M. and Schulze-Hagen, K. 2011. Internal incubation and early hatching in brood parasitic birds. *Proceedings of the Royal Society B-Biological Sciences*, 278: 1019-1024.

Bollmohr, S., van den Brink, P.J., Wade, P.W., Day, J.A. and Schultz, R. 2011. Environmental variables, pesticide pollution and meiofaunal community structure in two contrasting temporarily open/closed False Bay estuaries. *Water SA*, 37(3): 391-400.

Braby, J., Braby, S.J., Braby, R. and Altwegg, R. 2011. Immature survival and age at first breeding of Damara Terns: conservation from a non-breeding perspective. *Ardea*, 99(2): 185-190.

Braby, J., Underhill, L.G. and Simmons, R.E. 2011. Prey capture success and chick diet of Damara terns *Sterna*

- balaenarum* in Namibia. African Journal of Marine Science, 33(2): 247-254.
- Branch, G.M. 2011. Intraspecific Competition in *Patella cochlear* Born. Journal of Animal Ecology, 44(1): 263-281.
- Caron, A., Abolnik, C., Mundava, J., Gaidet, N., Burger, C.E., Mochotloane, B., Bruinzeel, L.W., Chiweshe, N., De Garine-Wichatitsky, M. and Cumming, G.S. 2011. Persistence of low pathogenic avian influenza virus in waterfowl in a southern African ecosystem. Ecohealth, 8: 109-115.
- Charalampopoulou, A., Poulton, J., Tyrrell, T. and Lucas, M.I. 2011. Irradiance and pH affect coccolithophore community composition on a transect between the North Sea and the Arctic Ocean. Marine Ecology-Progress Series, 431: 25-43.
- Chinsamy-Turan, A. 2011. Tiarajudens: a significant mammal-like reptile. South African Journal of Science, 107(5/6): 11-12.
- Cooper, J. and Clokie, L. 2010. Brown skuas *Stercorarius antarcticus* incubate macaroni penguin *Eudyptes chrysolophus* egg at Marion Island. Marine Ornithology, 38: 59-60.
- Covas, R., Deville, A.S., Doutrelant, C., Spottiswoode, C.N. and Grégoire, A. 2011. The effect of helpers on the postfledging period in a cooperatively breeding bird, the sociable weaver. Animal Behaviour, 81: 121-126.
- Crawford, R.J.M., Altwegg, R., Barham, B., Durant, J.M., Dyer, B.M., D Geldenhuys, D., Makhado, A.B., Pichegru, L., Barham, P., Ryan, P.G., Underhill, L.G., Upfold, L., Visagie, J., Waller, L. and Whittington, P.A. 2011. Collapse of South Africa's penguins in the early 21st century. African Journal of Marine Science, 33(1): 139-156.
- Cruaud, A., Jabbour-Zahab, R., Genson, G., Couloux, A., Yan-Qiong, P., Da Rong, Y. and van Noort, S. 2011. Out of Australia and back again: the world-wide historical biogeography of non-pollinating fig wasps (Hymenoptera:Sycopaginae). Journal of Biogeography, 38: 209-225.
- Cumming, G.S. 2011. Spatial resilience: integrating landscape ecology, resilience, and sustainability. Landscape Ecology, 26: 899-909.
- Cumming, G.S. 2011. The resilience of big river basins. Water International, 36(1): 63-95.
- Cumming, G.S. and Ndlovu, M. 2011. Satellite telemetry of Afrotropical ducks: methodological details and assessment of success rates. African Zoology, 46(2): 425-434.
- Cumming, G.S., Caron, A., Abolnik, C., Cattoli, G., Bruinzeel, L.W., Burger, C.E., Cecchetti, K., Chiweshe, N., Mochotloane, B., Mutumi, G. and Ndlovu, M. 2011. The ecology of influenza A viruses in wild birds in Southern Africa. EcoHealth, 8: 413.
- Cundill, G., Cumming, G.S., Biggs, D. and Fabricius, C. 2011. Soft systems thinking and social learning for adaptive management. Conservation Biology, 26(1): 13-20.
- Cunningham, S., Alley, M.R. and Castro, I. 2011. Facial bristle feather histology and morphology in New Zealand birds: implications for function. Journal of Morphology, 272: 118-128.
- Cunningham, S. and Castro, I. 2011. The secret life of wild brown kiwi: studying behaviour of a cryptic species by direct observation. New Zealand Journal of Ecology, 35(3): 209-219.
- Cury, P., Boyd, I.L., Bonhommeau, S., Anker-Nilssen, T., Crawford, R., Furness, R.W., Mills, J.A., Murphy, E.J., Osterblom, H., Paleczny, M., Piatt, J.F., Roux, J.-P., Shannon, L. and Sydeman, W.J. 2011. Global seabird response to forage fish depletion - one-third for the birds. Science, 334: 1703-1706.
- Cuthbert, R., Visser, P., Louw, H. and Ryan, P.G. 2011. Palatability and efficacy of rodent baits for eradicating house mice (*Mus musculus*) from Gough Island, Tristan da Cunha. Wildlife Research, 38: 196-203.
- Dallas, H. and Rivers-Moore, N. 2011. Micro-scale heterogeneity in water temperature. Water SA, 37(4): 505-512.
- Dallas, H. and Ketley, Z.A. 2011. Upper thermal limits of aquatic macroinvertebrates: comparing critical thermal maxima with 96-LT(50) values. Journal of Thermal Biology, 36: 322-327.
- De Lecea, A.M., Cooper, R., Omarjee, A. and Smit, A.J. 2011. The effects of preservation methods, dyes and acidification on the isotopic values($\delta^{15}\text{N}$ and $\delta^{13}\text{C}$) of two zooplankton species from the KwaZulu-Natal Bight, South Africa. Rapid Communications in Mass Spectrometry, 25(13): 1853-1861.
- De Villiers, M.S., Mecenero, S., Sherley, R.B., Heinze, E., Kieser, J., Leshoro, T.M., Merbold, L., Nordt, A., Parsons, N.J. and Peter, H.-U. 2010. Introduced European rabbits (*Oryctolagus cuniculus*) and domestic cats (*Felis catus*) on Robben Island: Population trends and management recommendations. South African Journal of Wildlife Research, 40: 139-148.
- Djernaes, M., Klass, K.-D., Picker, M.D. and Damgaard, J. 2011. Phylogeny of cockroaches (Insecta, Dictyoptera,

- Blattodea), with placement of aberrant taxa and exploration of out-group sampling. *Systematic Entomology*, 37(1): 65-83.
- Doutrelant, C., Dalecky, A. and Covas, R. 2011. Age and relatedness have an interactive effect on the feeding behaviour of helpers in cooperatively breeding sociable weavers. *Behaviour*, 148: 1399-1417.
- Duy-Jacquemin, M.N., Uys, C.J. and Geoffroy, J.J. 2011. Two remarkable new species of Penicillata (Diplopoda, Polyxenida) from Table Mountain National Park (Cape Town, South Africa). *ZooKeys*, 156: 85-103.
- Eberhard, M.J.B., Picker, M.D. and Klass, K.-D. 2011. Sympatry in Mantophasmatodea, with the description of a new species and phylogenetic considerations. *Organisms Diversity & Evolution*, 11(1): 43-59.
- Fahrig, L., Baudry, J., Brotons, L. and Sirami, C. 2011. Functional landscape heterogeneity and animal biodiversity in agricultural landscapes. *Ecology Letters*, 14: 101-112.
- Flower, T. 2011. Fork-tailed drongos use deceptive mimicked alarm calls to steal food. *Proceedings of the Royal Society B-Biological Sciences*, 278: 1548-1555.
- Fort, J., Porter, W.P. and Grémillet, D. 2011. Energetic modelling: a comparison of the different approaches used in seabirds. *Comparative Biochemistry and Physiology A-Molecular & Integrative Physiology*, 158: 358-365.
- Fuchs, J., Fjeldså, J. and Bowie, R.C.K. 2011. Diversification across an altitudinal gradient in the Tiny Greenbul (*Phyllastrephus debilis*) from the Eastern Arc Mountains of Africa. *BMC Evolutionary Biology*, 11:17. (17pp).
- Fuchs, J., Crowe, T. and Bowie, R.C.K. 2011. Phylogeography of the fiscal shrike (*Lanius collaris*): a novel pattern of genetic structure across the arid zones and savannas of Africa. *Journal of Biogeography*, 38: 2210-2222.
- Gäde, G., Simek, P. and Fescemyer, H.W. 2011. Adipokinetic hormones provide inference for the phylogeny of Odonata. *Journal of Insect Physiology*, 57(1): 174-178.
- Gäde, G., Simek, P. and Marco, H. 2011. An invertebrate [hydroxyproline]-modified neuropeptide: further evidence for a close evolutionary relationship between insect adipokinetic hormone and mammalian gonadotropin hormone family. *Biochemical and Biophysical Research Communications*, 414(3): 529-597.
- Gäde, G. and Marco, H. 2011. The adipokinetic hormone family in Chrysomeloidea: structural and functional considerations. *ZooKeys*, 157: 81-94.
- Goetz, A., Kerwath, S.E., Attwood, C.G. and Sauer, W.H.H. 2011. An alternative method for estimating the status of resident reef fish stocks, based on differential fishing effort across a marine reserve boundary. *African Journal of Marine Science*, 33(1): 107-113.
- González-Solís, J., Smyrli, M., Militão, T., Grémillet, D., Tveraa, T., Phillips, R.A. and Boulinier, T. 2011. Combining stable isotope analyses and geolocation to reveal kittiwake migration. *Marine Ecology-Progress Series*, 435: 251-261.
- Govender, R., Avery, G. and Chinsamy-Turan, A. 2011. Pathologies in the Early Pliocene phocid seals from Langebaanweg, South Africa. *South African Journal of Science*, 107(1/2): 1-6.
- Grantham, H., Richardson, A.J., Huggett, J.A., Coetzee, J., Petersen, S.L., Merkle, U., Possingham, H.P., Huggett, J.A., Game, E., Lombard, A.T., van der Lingen, C.D., Hobday, A., Beckley, L. and Pressey, R.L. 2011. Accommodating dynamic oceanographic processes and pelagic biodiversity in marine conservation planning. *PLoS One*, 6(2): e16552. (16pp).
- Grémillet, D. and Lescroël, A. 2011. Libyan uprising may boost bluefin tuna. *Nature*, 472: 169.
- Grote, B., Hagen, W., Lipinski, M.R., Verheye, H.M.S., Stenevik, E.K. and Ekau, W. 2011. Lipids and fatty acids as indicators of egg condition, larval feeding and maternal effects in Cape hakes (*Merluccius paradoxus* and *M. capensis*). *Marine Biology*, 158: 1005-1017.
- Haley, C., Blamey, L., Atkinson, L. and Branch, G.M. 2011. Dietary change of the rock lobster *Jasus lalandii* after an invasive geographic shift: Effects of size, density and food availability. *Estuarine Coastal and Shelf Science*, 30: 160-170.
- Helm, C., Wilson, G., Midgley, J.J., Kruger, L. and Witkowski, E. 2011. Investigating the vulnerability of an African savanna tree *Sclerocarya birrea* ssp. *caffra* to fire and herbivory. *Austral Ecology*, 36: 10.
- Hockey, P.A.R., Wanless, R.M. and von Brandis, R. 2011. Demographic resilience of territorial island birds to extinction: the flightless Aldabra Rail *Dryolimnas (cuvieri) aldabranus* as an example. *Ostrich*, 82(1): 19.
- Hockey, P.A.R., Sirami, C., Ridley, M., Midgley, G.F. and Babiker, H. 2011. Interrogating recent range changes in South African birds: confounding signals from land use and climate change present a challenge for attribution. *Diversity and Distributions*, 17: 254-261.
- Hoffmann, J.H., Moran, V.C. and van Wilgen, B. 2011. Prospects for the biological control of invasive *Pinus* species (Pinaceae) in South Africa. *African Entomology*, 19(2): 393-401.

- Hofmeyr, G.J.G., du Toit, M. and Kirkman, S.P. 2011. Early post-release survival of stranded Cape fur seal pups at Black Rocks, Algoa Bay, South Africa. *African Journal of Marine Science*, 33(3): 463-468.
- Hollén, L.I., Bell, M.B.V., Russell, A., Niven, F., Ridley, M. and Radford, A.N. 2011. Calling by concluding sentinels: coordinating cooperation or revealing risk? *PLoS One*, 6(10): e25010. (6pp).
- Hollén, L.I., Bell, M.B.V., Wade, H.M., Rose, R., Russell, A., Niven, F., Ridley, M. and Radford, A.N. 2011. Ecological conditions influence sentinel decisions. *Animal Behaviour*, 82: 1435-1441.
- Houser, A.M., Gusset, G.M., Bragg, C., Boast, L.K. and Somers, M.J. 2011. Pre-release hunting training and post-release monitoring are key components in the rehabilitation of orphaned large felids. *South African Journal of Wildlife Research*, 41(1): 11-20.
- Huisamen, J., Kirkman, S.P., Watson, L., Cockcroft, V.G. and Pistorius, P.A. 2011. Recolonisation of the Robberg Peninsula (Plettenberg Bay, South Africa) by Cape fur seals. *African Journal of Marine Science*, 33(3): 453-461.
- Impson, F.A.C., Kleinjan, C.A., Hoffmann, J.H., Post, J.A. and Wood, A.R. 2011. Biological control of Australian *Acacia* species and *Paraserianthes lophantha* (Willd.) Nielsen (Mimosaceae) in South Africa. *African Entomology*, 19(2): 186-207.
- Jacobs, D.S. and Odendaal, L. 2011. Morphological correlates of echolocation frequency in the endemic Cape horseshoe bat, *Rhinolophus capensis* (Chiroptera: Rhinolophidae). *Journal of Comparative Physiology A-Neuroethology Sensory Neural and Behavioral Physiology*, 197(5): 435-446.
- Jenkins, A.R., Shaw, J.M., Smallie, J.J., Gibbons, B., Visagie, R. and Ryan, P.G. 2011. Estimating the impacts of power line collisions on Ludwig's Bustards *Neotis ludwigii*. *Bird Conservation International*, 21: 303-310.
- Jewell, O.J.D., Wcisel, M.A., Gennari, E., Towner, A., Bester, M., Johnson, R. and Singh, S. 2011. Effects of smart position only (SPOT) tag deployment on white sharks *Carcharodon carcharias* in South Africa. *PLoS One*, 6(11)(e27242): 1-4.
- Joseph, G., Cumming, G.S., Cumming, D., Mahlangu, Z., Altwegg, R. and Seymour, C.L. 2011. Large termitaria act as refugia for tall trees, deadwood and cavity-using birds in a miombo woodland. *Landscape Ecology*, 26: 439-448.
- Joubert, W., Thomalla, S., Waldron, H.N., Lucas, M.I., Boye, M., Le Moigne, F., Planchon, F. and Speich, S. 2011. Nitrogen uptake by phytoplankton in the Atlantic sector of the Southern Ocean during late austral summer. *Biogeosciences*, 8: 2947-2959.
- Kaplan, B.S., O'Riain, M.J., Van Eeden, R. and King, A.J. 2011. A low-cost manipulation of food resources reduces spatial overlap between baboons (*Papio ursinus*) and humans in conflict. *International Journal of Primatology*, 32(6): 1397-1412.
- Karnovsky, N.J., Brown, Z., Welcker, J., Harding, A.M.A., Walkusz, W., Cavalcanti, A., Hardin, J., Kitaysky, A., Gabrielsen, G. and Gremillet, D. 2011. Inter-colony comparison of diving behavior of an Arctic to predator: implications for warming in the Greenland Sea. *Marine Ecology-Progress Series*, 440: 229-240.
- Kirkman, S.P., Oosthuizen, W.H., Meyer, M.A., Seakamela, S.M. and Underhill, L.G. 2011. Prioritising range-wide scientific monitoring of the Cape fur seal in southern Africa. *African Journal of Marine Science*, 33(3): 495-509.
- Kohler, S., Connan, M., Hill, J.M., Mablouk, C., Ludynia, K., Bonnevie, B.T., Kemper, J., Huisamen, J., Underhill, L.G., Cherel, Y., McQuaid, C. and Jaquemet, S. 2011. Geographic variation in the trophic ecology of an avian rocky shore predator, the African black oystercatcher, along the southern African coastline. *Marine Ecology-Progress Series*, 435: 235-249.
- Lescroel, A. and Grémillet, D. 2011. Fishery threatens protected ocean. *Nature*, 479: 299.
- Lipshutz, S., Remisiewicz, M., Underhill, L.G. and AVNI, J. 2011. Seasonal fluctuations in population size and habitat segregation of Kittlitz's Plover *Charadrius pecuarius* at Barberspan Bird Sanctuary, North West province, South Africa. *Ostrich*, 82(3): 207-215.
- Lucas, M.I. and Rouault, M. 2011. Scorched, frozen or flooded! What's happening to the weather? *Quest*, 7(1): 38-40.
- Macgregor, L., Cumming, G.S. and Hockey, P.A.R. 2011. Understanding pathogen transmission dynamics in waterbird communities: at what scale should interactions be studied? *South African Journal of Science*, 107(9/10): 1-10.
- Mandiwana-Neudani, T., Kopuchian, C., Louw, G.J. and Crowe, T. 2011. A study of gross morphological and histological syringeal features of true francolins (Galliformes: *Francolinus*, *Scleroptila*, *Peliperdix* and *Dendroperdix* spp.) and spurfowls (*Ptemistis* spp.) in a phylogenetic context. *Ostrich*, 82(2): 115-127.
- Marchante, H., Freitas, H. and Hoffmann, J.H. 2011. Assessing the suitability and safety of a well-known bud-galling wasp, *Trichilogaster acaciaelongifoliae*, for biological control of *Acacia longifolia* in Portugal. *Biological Control*, 56: 193-201.

- Marchante, H., Freitas, H. and Hoffmann, J.H. 2011. Post-clearing recovery of coastal dunes invaded by *Acacia longifolia*: is duration of invasion relevant for management success? *Journal of Applied Ecology*, 10: 1295-1304.
- Marchante, H., Freitas, H. and Hoffmann, J.H. 2011. The potential role of seed banks in the recovery of dune ecosystems after removal of invasive plant species. *Applied Vegetation Science*, 14: 107-119.
- Marco, H., Simek, P. and Gade, G. 2011. The first decapeptide adipokinetic hormone (AKH) in Heteroptera: A novel AKH from a South African saucer bug, *Laccocoris spurcus* (Naucoridae, Laccocorinae). *Peptides*, 32(3): 454-460.
- Martin, T., Lloyd, P., Bosque, C., Barton, D.C., Bianucci, A.L., Cheng, Y.R. and Ton, R. 2011. Growth rate variation among passerine species in tropical and temperate sites: an antagonistic interaction between parental food provisioning and nest predation risk. *Evolution*, 65(6): 1607-1622.
- McGeoch, M.A., Sithole, H., Samways, M., Simaika, J.P., Pryke, J.S., Picker, M.D., Uys, C.J., Armstrong, A.J., Dippenaar-Schoeman, A.S., Engelbrecht, I.A., Braschler, B. and Hamer, M. 2011. Conservation and monitoring of invertebrates in terrestrial protected areas. *Koedoe: Research Journal of the South African National Parks*, 53(2): 1-13.
- McLeish, M., Guo, D., van Noort, S. and Midgley, G.F. 2011. Life on the edge: Rare and restricted episodes of a pan-tropical mutualism adapting to drier climates. *New Phytologist*, 191: 210-222.
- Mead, A., Carlton, J., Griffiths, C.L. and Rius, M. 2011. Introduced and cryptogenic marine and estuarine species of South Africa. *Journal of Natural History*, 45: 2463-2524.
- Mead, A., Carlton, J., Griffiths, C.L. and Rius, M. 2011. Revealing the scale of marine bioinvasions in developing regions: a South African re-assessment. *Biological Invasions*, 13: 1991-2008.
- Meissner, T.W.J., Remisiewicz, M. and Pilacka, L. 2011. Investigations of sexual dimorphism in live Kittlitz's Plover *Charadrius pecuarius* from inland South Africa. *Ostrich*, 82(2): 135-139.
- Melo, M., Warren, B.H. and Jones, P.J. 2011. Rapid parallel evolution of aberrant traits in the diversification of the Gulf of Guinea white-eyes (Aves, Zosteropidae). *Molecular Ecology*, 20: 4953-4967.
- Meyer, M.A., Anderson-Reade, M.D., Cliff, G., Dudley, S. and Kirkman, S.P. 2011. Trends and interventions in large whale entanglement along the South African coast. *African Journal of Marine Science*, 33(3): 429-439.
- Mills, M., Olmos, F., Melo, M. and Dean, W.R.J. 2011. Mount Moco: its importance to the conservation of Swierstras Francolin *Pternistis swierstrai* and the Afromontane avifauna of Angola. *Bird Conservation International*, 21: 119-133.
- Mlambo, M., Bird, M., Reed, C.C. and Day, J.A. 2011. Diversity patterns of temporary wetland macroinvertebrate assemblages in the south-western Cape, South Africa. *African Journal of Aquatic Science*, 36(1): 299-308.
- Molodtsova, T.N., Griffiths, C.L. and Acuna, F. 2011. A new species of shallow-water cerianthid (Cnidaria: Anthozoa) from South Africa, with remarks on the genus *Ceriantheopsis*. *African Natural History*, 7: 1-8.
- Moloney, C.L., St John, M.A., Denman, K., Karl, M., Kster, F.W., Sundby, S. and Wilson, R. 2011. Weaving marine food webs from end to end under global change. *Journal of Marine Systems*, 84: 106-116.
- Moran, V.C., Hoffmann, J.H. and Hill, M.P. 2011. A context for the 2011 compilation of reviews on the biological control of invasive alien plants in South Africa. *African Entomology*, 19(2): 177-185.
- Musvuugwa, M. and Hockey, P.A.R. 2011. Latitudinal patterns of reproductive effort in gamebirds and waterfowl: bucking the trend? *Ibis*, 153: 165-169.
- Nchu, F., Githiori, J.B., McGaw, L.J. and Eloff, J.N. 2011. Anthelmintic and cytotoxic activities of extracts of *Markhamia obtusifolia* Sprague (Bignoniaceae). *Veterinary Parasitology*, 183: 184-188.
- Ndhlovu, T., Milton, S. and Esler, K.J. 2011. Impact of *Prosopis* (mesquite) invasion and clearing on the grazing capacity of semiarid Nama Karoo rangeland, South Africa. *African Journal of Range and Forage Science*, 28(3): 129-137.
- Nel, J., Turak, E., Linke, S. and Brown, C. 2011. Integration of environmental flow assessment and freshwater conservation planning: a new era in catchment management. *Marine and Freshwater Research*, 62(3): 290-299.
- Nelson-Flower, M., Hockey, P.A.R., O'Ryan, C., Raihani, N.J., Du Plessis, M.A. and Ridley, M. 2011. Monogamous dominant pairs monopolize reproduction in the cooperatively breeding pied babbler. *Behavioral Ecology*, 22: 559-565.
- Oatley, G., Bowie, R.C.K. and Crowe, T. 2011. The use of subspecies in the systematics of southern African white-eyes: historical entities or eco-geographic variants. *Journal of Zoology*, 284: 21-30.
- O'Riain, M.J. and Hoffman, T. 2011. The spatial ecology of Chacma Baboons (*Papio ursinus*) in a human-modified environment. *International Journal of Primatology*, 32(2): 308-328.

- Paterson, I.D., Hoffmann, J.H., Klein, H., Mathenge, C.W., Naser, S. and Zimmermann, H.G. 2011. Biological control of Cactaceae in South Africa. *African Entomology*, 19(2): 230-246.
- Pfaff, M., Branch, G.M., Wieters, E., Branch, R.A. and Broitman, B.R. 2011. Upwelling intensity and wave exposure determine recruitment of intertidal mussels and barnacles in the southern Benguela upwelling region. *Marine Ecology-Progress Series*, 425: 141-152.
- Phiri, C., Chakona, A. and Day, J.A. 2011. Aquatic insects associated with two morphologically different submerged macrophytes, *Lagarosiphon ilicifolius* and *Vallisneria aithiopica*, in small fishless ponds. *Aquatic Ecology*, 45(3): 405-416.
- Phiri, C., Chakona, A. and Day, J.A. 2011. The effect of plant density on epiphytic macroinvertebrates associated with a submerged macrophyte, *Lagarosiphon ilicifolius* Obermeyer, in Lake kariba, Zimbabwe. *African Journal of Aquatic Science*, 36(3): 289-297.
- Pichegru, L., Ropert-Coudert, Y., Kato, A., Takahashi, A., Dyer, B.M. and Ryan, P.G. 2011. Diving patterns of female macaroni penguins breeding on Marion Island, South Africa. *Polar Biology*, 34: 945-954.
- Pillay, D. and Branch, G.M. 2011. Bioengineering effects of burrowing Thalassinidean shrimps on marine soft-bottom ecosystems. *Oceanography and Marine Biology*, 49: 137-192.
- Pillay, D., Branch, G.M., Dawson, J. and Henry, D. 2011. Contrasting effects of ecosystem engineering by the cordgrass *Spartina maritima* and the sandprawn *Callinassa kraussi* in a marine-dominated lagoon. *Estuarine Coastal and Shelf Science*, 91: 169-176.
- Pillay, D. and Dawson, J. 2011. Influence of starfish grazing on lagoonal microalgal communities: non-competitive mechanisms for unimodal effects on diversity. *Marine Ecology-Progress Series*, 435: 75-82.
- Pitcher, G.C., Krock, B. and Cembella, A.D. 2011. Accumulation of diarrhetic shellfish poisoning toxins in the oyster *Crassostrea gigas* and the mussel *Choromytilus meridionalis* in the southern Benguela ecosystem. *African Journal of Marine Science*, 33(2): 273-281.
- Pitcher, G.C. and Probyn, T. 2011. Anoxia in southern Benguela during the autumn of 2009 and its linkage to a bloom of the dinoflagellate *Ceratium balechii*. *Harmful Algae*, 11: 23-32.
- Pohle, G., Iken, I., Clarke, R.K., Trott, T., Konar, B., Cruz-Motta, J.o.s.e., Wong, M., Benedetti-Cecchi, L., Mead, A., Miloslavich, P., Mieszkowska, N., Milne, R., Tamburello, L., Knowlton, A., Kimani, E. and Shirayama, Y. 2011. Aspects of benthic decapod diversity and distribution from rocky nearshore habitat at geographically widely dispersed sites. *PLoS One*, 6(4): e18606. (11pp).
- Pons, J.-M., Oliso, G., Cruaud, C. and Fuchs, J. 2011. Phylogeography of the Eurasian green woodpecker (*Picus viridis*). *Journal of Biogeography*, 38: 3113-3125.
- Pryke, J.S., Samways, M. and Hockey, P.A.R. 2011. Persistence of the threatened Knysna warbler *Bradypterus sylvaticus* in an urban landscape: do gardens substitute for fire? *African Journal of Ecology*, 49: 199-208.
- Puttick, J., Hoffman, M.T. and Gambiza, J. 2011. Historical and recent land-use impacts on the vegetation of Bathurst, a municipal commonage in the Eastern Cape, South Africa. *African Journal of Range and Forage Science*, 28(1): 920.
- Quillfeldt, P., Schroff, S., van Noordwijk, H.J., Michalik, A., Ludynia, K. and Masello, J.F. 2011. Flexible foraging behaviour of a sexually dimorphic seabird: large males do not always dive deep. *Marine Ecology-Progress Series*, 428: 271-287.
- Radford, A.N., Bell, M.B.V., Hollen, L.I. and Ridley, M. 2011. Singing for your supper: sentinel calling by kleptoparasites can mitigate the cost to victims. *Evolution*, 65(3): 900-906.
- Reaugh-Flower, K., Branch, G.M., Harris, J.M., McQuaid, C., Currie, B., Dye, A. and Robertson, B. 2011. Scale-dependent patterns and processes of intertidal mussel recruitment around southern Africa. *Marine Ecology-Progress Series*, 434: 101-119.
- Remisiewicz, M. and AVNI, J. 2011. Status of migrant and resident waders, and moult strategies of migrant waders using African inland wetland habitats, at Barberspan Bird Sanctuary in South Africa. *Ibis*, 153(2): 433-437.
- Ribeiro, A., Lloyd, P. and Bowie, R.C.K. 2011. A tight balance between natural selection and gene flow in a Southern African arid-zone endemic bird. *Evolution*, 65(12): 3499-3514.
- Richardson, D.M., Carruthers, J., Hui, C., Impson, F.A.C., Miller, T., Robertson, M.P., Rouget, M., Le Roux, J.J. and Wilson, J.R.U. 2011. Human-mediated introductions of Australian acacias a global experiment in biogeography. *Diversity and Distributions*, 17: 771-787.
- Ridley, M. and Thompson, A.M. 2011. Heterospecific egg destruction by Wattle Starlings and the impact on Pied Babbler reproductive success. *Ostrich*, 82(3): 201-205.
- Rius, M. and Teske, P. 2011. A revision of the *Pyura stolonifera* species complex (Tunicata, Ascidiacea), with

a description of a new species from Australia. *Zootaxa*, 2754: 27-40.

Rius, M., Heasman, K.G. and McQuaid, C. 2011. Long-term coexistence of non-indigenous species in aquaculture facilities. *Marine Pollution Bulletin*, 62: 2395-2403.

Robson, B., Glass, T., Glass, N., Glass, J., Green, J., Repetto, C., Rodgers, G., Ronconi, R.A., Ryan, P.G., Swain, G. and Cuthbert, R.J. 2011. Revised population estimate and trends for the endangered Northern Rockhopper Penguin *Eudyptes moseleyi* at Tristan da Cunha. *Bird Conservation International*, 21: 454-459.

Rosendo, S., Brown, K., Joubert, A.R., Jiddawi, N. and Mechisso, M. 2011. A clash of values and approaches: A case study of marine protected area planning in Mozambique. *Ocean & Coastal Management*, 54: 55-65.

Ryan, P.G. and Ronconi, R.A. 2011. Continued increase in numbers of spectacled petrels *Procellaria conspicillata*. *Antarctic Science*, 23: 332-336.

Ryan, P.G., Glass, N. and Ronconi, R.A. 2011. The plants and birds of Stoltenhoff and Middle Islands, Tristan da Cunha. *Polar Record*, 47: 86-90.

Schoeman, M.C. and Jacobs, D.S. 2011. The relative influence of competition and prey defences on the trophic structure of animalivorous bat ensembles. *Oecologia*, 166(2): 493-506.

Schultz, A., Underhill, L.G., Earle, R. and Underhill, G. 2011. Seasonality, distribution and taxonomic status of avian haemosporidian parasites within the Greater Cape Town area, South Africa. *Ostrich*, 82(2): 141-153.

Scott, A., Dean, W.R.J. and Watson, L. 2011. Breeding success and changes in numbers of African black oystercatchers *Haematopus moquini* in relation to habitat quality and protection status. *Marine Ornithology*, 39: 189-199.

Swedell, L., Saunders, J., Schreier, A., Davis, B., Tesfaye, T. and Pines, M. 2011. Female "dispersal" in Hamadryas baboons: transfer among social units in a multilevel society. *American Journal of Physical Anthropology*, 145: 360-370.

Simmons, R.E. 2011. Greater Kestrel survives impact with power lines. *Ostrich*, 82(1): 75-76.

Sithaldeen, R., Bishop, J. and Ackermann, R. 2011. The role of landscape in shaping contemporary genetic structure in the chacma baboon (*Papio ursinus*). *American Journal of Physical Anthropology*, 144: 275-275.

Smith, A., Brown, C.J., Bulman, C.M., Fulton, E.A., Johnson, P., Kaplan, I.C., Lozano-Montes, H., Mackinson,

S., Marzloff, M., Shannon, L. and Shin, Y.-J. 2011. Impacts of fishing low trophic level species on marine ecosystems. *Science*, 333: 1147-1150.

Smith, M.D. and Jarre, A.C. 2011. Modelling regime shifts in the southern Benguela: a frame-based approach. *African Journal of Marine Science*, 33(1): 17-35.

Spottiswoode, C.N., Stryjewski, K.F., Quader, S., Colebrook-Robjent, J.F.R. and Sorenson, M.D. 2011. Ancient host specificity within a single species of brood parasitic bird. *Proceedings of the National Academy of Sciences of the United States of America*, 108(43): 17738-17742.

Spottiswoode, C.N. and Stevens, M. 2011. How to evade a coevolving brood parasite: egg discrimination versus egg variability as host defences. *Proceedings of the Royal Society B-Biological Sciences*, 278: 3566-3573.

Stoffberg, S., Jacobs, D.S. and Matthee, C. 2011. The divergence of echolocation frequency in horseshoe bats: moth hearing, body size or habitat? *Journal Of Mammalian Evolution*, 18(2): 117-129.

Summers, R., Underhill, L.G. and Waltner, M. 2011. The dispersion of red knots *Calidris canutus* in Africa-is southern Africa a buffer for West Africa? *African Journal of Marine Science*, 33(2): 203-208.

Teske, P., Rius, M., McQuaid, C. and Styan, C.A. 2011. Nested cryptic diversity in a widespread marine ecosystem engineer: A challenge for detecting biological invasions. *BMC Evolutionary Biology*, 11:176 (13pages).

Thomalla, S., Waldron, H.N., Lucas, M.I., Read, J.F., Ansoorge, I.J. and Pakhomov, E.A. 2011. Phytoplankton distribution and nitrogen dynamics in the southwest Indian subtropical gyre and Southern Ocean waters. *Ocean Science*, 7(1): 113-127.


Thomas, D. and Chinsamy-Turan, A. 2011. Chemometric analysis of EDXRF measurements from fossil bone. *X-Ray Spectrometry*, 40(6): 441-445.

Thomas, D. and Ksepka, D.T. 2012. Multiple cenozoic invasions of Africa by penguins (Aves, Sphenisciformes). *Proceedings of the Royal Society B-Biological Sciences*, 10: 1-6.

Thomas, D., McGoverin, M., Chinsamy-Turan, A. and Manley, M. 2011. Near infrared analysis of fossil bone from the Western Cape of South Africa. *Journal of Near Infrared Spectroscopy*, 19(3): 151-159.

Thomas, D., Ksepka, D.T. and Fordyce, R.E. 2011. Penguin heat-retention structures evolved in a greenhouse Earth. *Biology Letters*, 7(3): 461-464.

- Thomas, D., McGoverin, M., Fordyce, R.E., Frew, R.D. and Gordon, K.C. 2011. Raman spectroscopy of fossil bioapatite - A proxy for diagenetic alteration of the oxygen isotope composition. *Palaeogeography Palaeoclimatology Palaeoecology*, 310: 62-70.
- Tuck, G.N., Phillips, R.A., Small, C., Thomson, R.B., Klaer, N.L., Taylor, F., Wanless, R.M. and Arrizabalaga, H. 2011. An assessment of seabird-fishery interactions in the Atlantic Ocean. *Ices Journal of Marine Science*, 68(8): 1628-1637.
- Turner, R.C., Midgley, J.J., Barnard, P., Simmons, R.E. and Johnson, S.D. 2011. Experimental evidence for bird pollination and corolla damage by ants in the short-tubed flowers of *Erica halicacaba* (Ericaceae). *South African Journal of Botany*, 79: 25-31.
- Valeix, M., Fritz, H., Sabatier, R., Murindagomo, F., Cumming, D. and Duncan, P. 2011. Elephant-induced structural changes in the vegetation and habitat selection by large herbivores in an African savanna. *Biological Conservation*, 144: 902-912.
- van der Horst, G., maree, L., Kotze, S.H. and O'Riain, M.J. 2011. Sperm structure and motility in the eusocial naked mole-rat, *Heterocephalus glaber*: a case of degenerative ortogenesis in the absence of sperm competition? *BMC Evolutionary Biology*, 11:351. (11pp).
- van Wilgen, B., Dyer, C., Hoffmann, J.H., Ivey, P., Le Maitre, D.C., Moore, J.L., Richardson, D.M., Rouget, M., Wannenburgh, A. and Wilson, J.R.U. 2011. National-scale strategic approaches for managing introduced plants: insights from Australian acacias in South Africa. *Diversity and Distributions*, 17: 1060-1075.
- Veldtman, R., Lado, T., Botes, A., Proches, S., Timm, A.E., Geertsema, H. and Chown, S. 2011. Creating novel food webs on introduced Australian acacias: indirect effects of galling biological control agents. *Diversity and Distributions*, 17: 958-967.
- Viseshakul, N., Charoennitikul, W., Kitamura, S., Kemp, A., Thong-Aree, S., Surapunpitak, Y., Poonswad, P. and Ponglikitmongkol, M. 2011. A phylogeny of frugivorous hornbills linked to the evolution of Indian plants within Asian rainforests. *Journal of Evolutionary Biology*, 24: 1533-1545.
- von Byern, J., Scott, R., Griffiths, C.L., Micossi, A., Grunwald, I. and Cyran, N. 2011. Characterization of the adhesive areas in *Sepia tuberculata* (Mollusca, Cephalopoda). *Journal of Morphology*, 272: 1245-1258.
- Wakelin, J., McKechnie, A.E. and Woodborne, S. 2011. Stable isotope analysis of migratory connectivity in a threatened intra-African migrant, the Blue Swallow (*Hirundo atrocaerulea*). *Journal of Ornithology*, 152: 171-177.
- White, C.R., Grémillet, D., Green, J.A., Martin, G.R. and Butler, P.J. 2011. Metabolic rate throughout the annual cycle reveals the demands of an Arctic existence in Great Cormorants. *Ecology*, 92(2): 475-486.
- White, C.R., Boertmann, D., Grémillet, D., Butler, P.J., Green, J.A. and Martin, G.R. 2011. The relationship between sea surface temperature and population change of Great Cormorants *Phalacrocorax carbo* breeding near Disko Bay, Greenland. *Ibis*, 153: 170-174.
- Whitehead, O.T., Biccard, A. and Griffiths, C.L. 2011. South African pelagic goose barnacles (Cirripedia, Thoracica): substratum preferences and influence of plastic debris on abundance and distribution. *Crustaceana*, 84: 635-649.
- Williamson, R., Field, J., Shillington, F.A., Jarre, A.C. and Potgieter, A.E.G. 2011. A Bayesian approach for estimating vertical chlorophyll profiles from satellite remote sensing: proof-of-concept. *ICES Journal of Marine Science*, 68(4): 792-799.
- Wilson, J.R.U., Gairifo, C., Gibson, M.R., Arianoutsou, M., Bakar, B., Baret, S., Celesti-Grapow, L., DiTomaso, J.M., Dufour-Dror, J.M., Kueffer, C., Kull, C.A., Hoffmann, J.H., Impson, F.A.C., Loope, L.L., Marchante, E., Marchante, H., Moore, J.L., Murphy, D.J., Tassin, J., Witt, A., Zenni, R.D. and Richardson, D.M. 2011. Risk assessment, eradication, and biological control: global efforts to limit Australian acacia invasions. *Diversity and Distributions*, 17: 1030-1046.
- Pines, M., Swedell, L. and Saunders, J. 2011. Alternative routes to the leader male role in a multi-level society: follower vs. solitary male strategies and outcomes in Hamadryas Baboons. *American Journal of Primatology*, 73: 679-691.
- Woodson, C.B., Barth, J.A., Cheriton, O.M., McManus, M.A., Ryan, J.P., Washburn, L., Carden, K.N., Cheng, B.S., Fernandes, J., Garske, L.E., Gouhier, T.C., Haupt, A.J., Honey, K.T., Hubbard, M., Iles, A., Kara, L., Lynch, M.C., Mahoney, B., Pfaff, M., Pinsky, M.L., Robart, M.J., Stewart, J.S., Teck, S.J. and True, A. 2011. Observations of internal wave packets propagating along-shelf in northern Monterey Bay. *Geophysical Research Letters*, 38: L01605. (6pp).
- Woodward, H.N., Rich, T.H., Chinsamy-Turan, A. and Vickers-Rich, P. 2011. Growth dynamics of Australia's polar dinosaurs. *PLoS One*, 6:8. (e23339). 5pp.
- Wright, K.L.B., Pichegru, L. and Ryan, P.G. 2011. Penguins are attracted to dimethyl sulphide at sea. *Journal of Experimental Biology*, 214: 2509-2511.
- Zachariades, C., Hoffmann, J.H. and Roberts, A.P. 2011. Biological control of mesquite (*Prosopis* species) (Fabaceae) in South Africa. *African Entomology*, 19(2): 402-415.



Zetlmeisl, C., Hermann, J., Petney, T., Glenner, H., Griffiths, C.L. and Taraschewski, H. 2011. Parasites of the shore crab *Carcinus maenas*(L.): implications for reproductive potential and invasion success. *Parasitology*, 138(3): 394-401.

Peer-reviewed published conference proceedings

Cooper, J., Cuthbert, R.J., Gremmen, N., Ryan, P.G. and Shaw, J.D. 2011. Earth, fire and water: applying novel techniques to eradicate the invasive plant, procumbent pearlwort *Sagina procumbens*, on Gough Island, a World Heritage Site in the South Atlantic. In C.R. Veitch, M.N. Clout and D.R. Towns (eds), *Proceedings of the International Conference on Island Invasives*, 8-12 February 2010, University of Auckland, New Zealand. Gland, Switzerland and Auckland, New Zealand: IUCN and The Centre for Biodiversity and Biosecurity (CBB). ISBN 978-2-8317-1291-8.

Cuthbert, R.J., Visser, P., Louw, H., Rexer-Huber, K., Parker, G. and Ryan, P.G. 2011. Preparations for the eradication of mice from Gough Island: results of bait acceptance trials above ground and around cave systems. In C.R. Veitch, M.N. Clout and D.R. Towns (eds), *Proceedings of the International Conference on Island Invasives*, 8-12 February 2010, University of Auckland, New Zealand. Gland, Switzerland and Auckland, New Zealand: IUCN and The Centre for Biodiversity and Biosecurity (CBB). ISBN 978-2-8317-1291-8.

Guo, D., Guo, R., Cui, Y., Midgley, G.F., Altwegg, R. and Thiart, C. 2011. Climate change impact on quiver trees in arid Namibia and South Africa. In K. Hirota, D.A. Ralescu and J. Peng (eds), *Proceedings of the Second International Conference on Uncertainty Theory*, 6-11 August 2011, Lhasa, Tibet, China. Cincinnati, USA: International Consortium for Uncertainty Theory. ISSN 2079-5238.

Ramaboa, K. and Underhill, L.G. 2011. Eigenvector cutoff value for collinear variables in multivariate data. In *Proceedings of World Academy of Science, Engineering and Technology: WASET 2011 Winter International Conference*, 25-27 January 2011, Dubai. Dubai: Thomson Reuters. ISSN 2010-3778.