UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Spring Graduation Ceremony
Lentepromosieplegtigheid
Moletlo wa Dialoga wa Seruthwana

2021

Part 4 | Deel 4 | Karolo ya 4

Vision

To be a leading research-intensive university in Africa, recognised internationally for its quality, relevance and impact, and also for developing people, creating knowledge and making a difference locally and globally.

Mission

In pursuing recognition and excellence in its core functions of research, teaching and learning, and integrating engagement with society and communities into these, the University of Pretoria will use quality, relevance, diversity and sustainability as its navigational markers.

GROUPING

13 September 2021 | 15:00

Part 1

FACULTY OF EDUCATION

All postgraduate and undergraduate fields of study

Distance Education:
BEdHons(Teacher Education and Professional Development; Education Management, Law and Policy; Computer Integrated Education; Learning Support)

14 September 2021 | 10:00

Part 2

FACULTY OF THEOLOGY AND RELIGION

All postgraduate and undergraduate fields of study

FACULTY OF LAW

All postgraduate and undergraduate fields of study

14 September 2021 | 15:00

Part 3

FACULTY OF ECONOMIC AND MANAGEMENT SCIENCES

All postgraduate and undergraduate fields of study

GORDON INSTITUTE OF BUSINESS SCIENCE

All postgraduate fields of study

15 September 2021 | 10:00

Part 4

FACULTY OF NATURAL AND AGRICULTURAL SCIENCES

Departments:

Animal Sciences; Agricultural Economics, Extension and Rural Development; Biochemistry, Genetics and Microbiology; Consumer and Food Sciences; Plant and Soil Sciences, Zoology and Entomology

All postgraduate and undergraduate fields of study

15 September 2021 | 15:00

Part 5

FACULTY OF NATURAL AND AGRICULTURAL SCIENCES

Departments:
Actuarial Science; Chemistry; Geography, Geoinformatics and Meteorology; Geology; Mathematics and Applied Mathematics; Physics; Statistics

All postgraduate and undergraduate fields of study

16 September 2021 | 10:00

Part 6

FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

School for the Built Environment; School of Information Technology and Graduate School of Technology Management

All postgraduate and undergraduate fields of study

Honorary Doctorate: Ms SS Nation (posthumously)

16 September 2021 | 15:00

Part 7

FACULTY OF ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY

School of Engineering

All postgraduate and undergraduate fields of study

17 September 2021 | 10:00

Part 8

FACULTY OF HUMANITIES

All postgraduate and undergraduate fields of study

FACULTY OF VETERINARY SCIENCE

All postgraduate and undergraduate fields of study

17 September 2021 | 15:00

Part 9

FACULTY OF HEALTH SCIENCES

All postgraduate and undergraduate fields of study

CHANCELLOR
Prof LW Nkuhlu BCom(UFH) MBA(New York) CA(SA) DCom(*honoris causa*)(UFS) DCom(*honoris causa*)(US) DCom(*honoris causa*)(UCT) DCom(*honoris causa*)(UP) DAccSci(*honoris causa*)(UNISA)

CHAIRPERSON OF COUNCIL
Mr KD Dlamini MPhil(University of Oxford, England) BSocSci(Hons)(UKZN)

VICE-CHANCELLOR AND PRINCIPAL AND CHAIRPERSON OF SENATE
Prof T Kupe BA(Hons) MA(University of Zimbabwe) DPhil(University of Oslo, Norway) DHum(*honoris causa*)(Michigan State University, United States of America)

PRESIDENT OF THE CONVOCATION
Dr HH Köster BSc(Hons) MSc(UP) PhD(Kansas State University, United States of America)

VICE-PRINCIPALS
Prof NTF Duncan BA(Hons)(UWC) MA(Paul Valéry University, France) DPhil(UWC)
Prof NT Mosia BA(Hons) UED(University of the North) MA(Portland State University, United States of America) PhD(UP)
Prof A Ströh BSc(Hons) MSc PhD(UP)

REGISTRAR
Prof CMA Nicholson BProc LLB(Wits) LLM LLD(UNISA) PGDip(ADR) Attorney & Notary Public

EXECUTIVE DIRECTOR
Prof C Koornhof BCom(Hons)(UP) MCom(Wits) DCom(UP) CA(SA)

CHIEF OPERATING OFFICER
Mr SF Mthiyane BSc(UKZN) MBA(US) MSc(UCT)

ADVISOR TO THE UNIVERSITY EXECUTIVE
Prof M Wingfield BSc(Hons)(Natal) MSc(Stellenbosch) PhD(University of Minnesota, United States of America) DSc(*honoris causa*)(North Carolina State University, United States of America) DSc(*honoris causa*)(University of British Columbia, Canada)

DEANS OF FACULTIES

HUMANITIES	Prof V Reddy BA(Hons) HDE(Natal) MA(Wits) PhD(UKZN)
NATURAL AND AGRICULTURAL SCIENCES	Prof BFN Erasmus BSc(Hons) PhD(UP)
LAW	Prof E Schoeman BLC(UP) LLB LLD(UNISA)
THEOLOGY AND RELIGION	Prof J Pillay BTh(Hons) MTh(UDW) PhD(UCT) DD(*honoris causa*)(University of Debrecen, Hungary)
VETERINARY SCIENCE	Prof V Naidoo BVMCh(Medunsa) MSc PhD(UP)
ECONOMIC AND MANAGEMENT SCIENCES	Prof M Chitiga-Mabugu BScHons MSc(University of Zimbabwe) PhD(University of Gothenburg, Sweden)
EDUCATION	Prof CT Sehoole BAPaed(University of the North) BEd MEd PhD(Wits)
HEALTH SCIENCES	Prof C de Jager BSc BSc(Hons) MSc(UFS) PhD(UP)
ENGINEERING, BUILT ENVIRONMENT AND INFORMATION TECHNOLOGY	Prof BTJ Maharaj PrEng MScEng(Natal) MSc(Operat.Telecom) (Coventry, United Kingdom) PhD(UP)

DEAN: GORDON INSTITUTE OF BUSINESS SCIENCE
Dr M Mthombeni (Interim)
B.Juris B.Proc L.L.B(Unisa) MBA(Manchester, United Kingdom) PhD(UP)

DEAN: MAMELODI CAMPUS
Prof NA Ogude BSc(NUL) MSc(Nairobi) DTE(UNISA) PhD(Wits)

Faculty of Natural and Agricultural Sciences

Deputy dean	Prof P Bloomer BSc BSc(Hons)(NWU) PhD(UP)
Deputy dean	Prof VJ Maharaj MSc(UP) PhD(UNISA)

HEADS OF DEPARTMENTS

Actuarial Science	Ms M Venter BSc(Hons)(UJ) BCom(Hons)(UCT) MBA(Wits) PGCHE(UP) FASSA
African Centre for Gene Technologies	Dr JvW Becker Hons MSc PhD(US) MDP USB
Agricultural Economics, Extension and Rural Development	Prof SL Hendriks BSc BSc(Hons)(Home Econ) MSc(Home Econ) PhD(Natal)
Animal Science	Prof E van Marle-Köster BSc(Agric)(UP) MSc(Agric)(UFS) PhD(UP) Pr.Sci.Nat(Anim.Sci)
Biochemistry, Genetics and Microbiology	Prof S Naidoo MSc(Biotechnology) PhD(UP) Pr.Sci.Nat
Centre for Bioinformatics and Computational Biology	Prof F Joubert (acting) BSc(Hons) MSc PhD(UP)
Centre for Environmental Economics and Policy in Africa	Prof E Mungatana BSc(Hons)(Moi University, Kenya) MSc(Agricultural University of Norway, Norway) PhD(Dresden University of Technology, Germany)
Centre for Environmental Studies	Prof ERM Archer (acting) BA(Hons)(UCT) PhD(Clark University, United States of America)
Centre for Microbial Ecology and Genomics	Prof DA Cowan BSc MSc PhD(University of Waikato, New Zealand) FRSSAf, HonFRSNZ, MASSAf, MAAS
Chemistry	Prof M Landman (acting) BSc(Hons) MSc PhD(UP)
Consumer and Food Sciences	Prof EM Buys BSc(Hons)(NWU) MSc(UP) PhD(Wits)
Forestry and Agricultural Biotechnology Institute	Prof B Slippers BSc(Hons) MSc(UFS) PhD(UP) ASSAf
Geography, Geoinformatics and Meteorology	Prof S Coetzee BSc(Hons) HED MSc PHD(UP) GPr GISc
Geology	Prof AJ Bumby BSc(Hons)(University of St Andrews, Scotland) MSc PhD(UP)
Institute for Food, Nutrition and Well Being	Prof SL Hendriks BSc BSc(Hons)(Home Econ) MSc(Home Econ) PhD(Natal)
Mammal Research Institute	Prof A Ganswindt Dipl.Ing(FH)(University of Applied Sciences, TFH Berlin, Germany) PhD(University of Münster, Germany)

Mathematics and Applied Mathematics	Prof MK Banda BSc(University of Malawi, Malawi) MSc(Imperial College London, United Kingdom) MSc(University of Kaiserslautern, Germany) PhD(Technische Universität Darmstadt, Germany)
Physics	Prof CC Theron BSc(Hons)(NMU) MSc PhD(US)
Physiology	Prof AM Joubert BSc(Hons) MSc PhD(UP)
Plant and Soil Sciences	Prof NP Barker BSc(Hons) MSc(Wits) PhD(UCT)
Statistics	Prof A Bekker HED MSc(UJ) PhD(UNISA)
Zoology and Entomology	Prof ADS Bastos BSc(Hons) MSc PhD(UP)
University of Pretoria Natural Hazard Centre, Africa	Prof A Kijko MSc(Moscow State University, Russia) PhD(University of Warsaw, Poland) DSc(University of Kraków, Poland) Pr.Sci.Nat

PROGRAMME | PART 4

FACULTY OF NATURAL AND AGRICULTURAL SCIENCES

Wednesday, 15 September 2021 | 10:00

Academic procession

Constitution of the ceremony
Chancellor | Vice-Chancellor and Principal | Vice-Principal

Moment of silence

Welcome

Address

Conferment of degrees

Singing of national anthem

Dissolution of the ceremony

Academic procession leaves the hall

NB

(1) You are requested to stand when the academic procession enters the hall and also when it leaves at the conclusion of the proceedings.

(2) * Next to name:

Certificate or diploma with distinction: SRC Certificate of Merit.

Degree with distinction: SRC Academic Honorary Colours and Certificate of Merit.

(3) Specified field of study appears in parentheses.

(4) You are requested to switch off your cellphone and to refrain from moving about in the hall to take photos or make video recordings while the ceremony is in session.

(5) The words of the national anthem are printed on the inside back cover of the programme.

Faculty of Natural and Agricultural Sciences

Doctor of Philosophy

Aiki Istifanus Peni (Entomology)

Thesis	:	**Diversity, nesting behaviour, thermoregulation and cephalic secretions of termites from two Nigerian savannahs**
Supervisor	:	Dr AA Yusuf
Co-supervisor	:	Prof CWW Pirk
External examiner	:	Dr A Bagneres-Urbany (French National Centre for Scientific Research, France)
External examiner	:	Dr AB Davies (Harvard University, United States of America)
External examiner	:	Dr D Sillam-Dussès (University of Paris North, France)

Ayelo Mahukpe Pascal (Entomology)

Thesis	:	**Identification of kairomones for the biological control of *Tuta absoluta* (Meyrick) and *Trialeurodes vaporariorum* (Westwood), two major pests of tomato *Solanum lycopersicum* L.**
Supervisor	:	Dr AA Yusuf
Co-supervisor	:	Prof CWW Pirk
External co-supervisor	:	Dr ÉMM Delétré (French Agricultural Research Centre for International Development, France)
External examiner	:	Prof A Biondi (University of Catania, Italy)
External examiner	:	Prof A Cortesero (University of Rennes 1, France)
External examiner	:	Dr RS Nofemela (Agricultural Research Council)

Bekele Bethelihem Mekonnen (Entomology)

Thesis	:	**Semiochemicals from the African weaver ant *Oecophylla longinoda* (Hymenoptera: Formicidae) and their repellency on mango fruit flies**
Supervisor	:	Dr AA Yusuf
Co-supervisor	:	Prof CWW Pirk
External co-supervisor	:	Dr ÉMM Delétré (French Agricultural Research Centre for International Development, France)
External examiner	:	Prof T Dekker (Swedish University of Agricultural Sciences, Sweden)
External examiner	:	Prof EN Ngumbi (University of Illinois at Urbana-Champaign, United States of America)
External examiner	:	Dr PN Mothapo (Stellenbosch University)

Brannan Kelly Elizabeth (Animal Science)

Thesis	:	**Broiler performance and avian uncoupling protein mRNA expression during acute heat stress as influenced by thermal manipulation and dietary fat source**
Supervisor	:	Dr C Jansen van Rensburg
Internal examiner	:	Prof NH Casey
External examiner	:	Dr R Barekatain (South Australian Research and Development Institute, Australia)
External examiner	:	Dr RP Kwakkel (Wageningen University, The Netherlands)

Dawelbeit Iman Brema Hassaballa (Entomology)

Thesis	:	**Studies on sand fly resting habitats, plant feeding patterns and volatilome in a leishmaniasis endemic are of Kenya**
Supervisor	:	Prof CL Sole
Co-supervisor	:	Prof B Torto
External co-supervisor	:	Dr DP Tchouassi (International Centre of Insect Physiology and Ecology, Kenya)
External examiner	:	Prof D da Silva Tavares (Christus University Center, Brazil)
External examiner	:	Dr DAO Courtenay (University of Warwick, United Kingdom)
External examiner	:	Dr DEA Elnaiem (University of Maryland Eastern Shore, United States of America)

Engelbrecht Juanita (Microbiology)

Thesis	:	Population genetics and genomics of *Phytophthora cinnamomi*
Supervisor	:	Prof N van den Berg
Internal examiner	:	Prof ET Steenkamp
External examiner	:	Prof RR Vetukuri (Swedish University of Agricultural Sciences, Sweden)
External examiner	:	Dr F Martin (United States Department of Agriculture, United States of America)

Guignard Quentin (in Entomology)

Thesis	:	Visual and chemical ecology of *Sirex noctilio*
Supervisor	:	Dr JD Allison
Co-supervisor	:	Prof B Slippers
Internal examiner	:	Prof CWW Pirk
External examiner	:	Dr D Avtzis (Forest Research Institute, Greece)
External examiner	:	Dr RA Hayes (University of the Sunshine Coast, Australia)

Havenga Minette (Genetics)

Thesis	:	Biology and pathology of the *Eucalyptus* foliar pathogen *Teratosphaeria destructans*
Supervisor	:	Dr J Aylward
Co-supervisor	:	Prof BD Wingfield
Co-supervisor	:	Prof MJ Wingfield
External co-supervisor	:	Prof LL Dreyer (Stellenbosch University)
External co-supervisor	:	Prof F Roets (Stellenbosch University)
Internal examiner	:	Dr G Fourie
External examiner	:	Prof D Croll (University of Neuchâtel, Switzerland)
External examiner	:	Dr LSS Oliveira (Asia Pacific Resources International Limited, Indonesia)

Jordaan Rowan Keith (Zoology)

Thesis	:	The demography and sociality of killer whales, *Orcinus orca*, at subantarctic Marion Island
Supervisor	:	Prof PJN de Bruyn
External co-supervisor	:	Dr WC Oosthuizen (Nelson Mandela University)
External co-supervisor	:	Dr RR Reisinger (University of California Santa Cruz, United States of America)
External examiner	:	Prof PJ Miller (University of St Andrews, United Kingdom)
External examiner	:	Dr R Esteban (Madeira Whale Museum, Portugal)
External examiner	:	Dr SH Ferguson (University of Manitoba, Canada)

Kabwe Mubanga Hellen (in Microbiology)

Thesis	:	Metagenomic analysis of the South African human gut microbiome
Supervisor	:	Prof TP Makhalanyane
Internal examiner	:	Prof O Reva
External examiner	:	Prof S Kumar (Dr. Rammanohar Lohia Anadh University, India)
External examiner	:	Dr E Jameson (University of Warwick, United Kingdom)

Kung'u Caroline Wanjiku (Entomology)

Thesis	:	Biological traits, plant sugar feeding patterns and chemical ecology of *Aedes aegypti*
Supervisor	:	Prof CL Sole
Co-supervisor	:	Prof CWW Pirk
Co-supervisor	:	Prof B Torto
External co-supervisor	:	Dr DP Tchouassi (International Centre of Insect Physiology and Ecology, Kenya)
External examiner	:	Dr TE Lefevre (University of Montpellier, France)
External examiner	:	Dr AC Morrison (University of California, Davis, United States of America)
External examiner	:	Dr EJ Muturi (United States Department of Agriculture, United States of America)

Lefophane Mapula Hildah (in Agricultural Economics)

Thesis	:	The effects of information communication technology policy alternatives on South Africa's agro-processing industries
Supervisor	:	Dr MW Kalaba
Internal examiner	:	Dr MN Makhura
External examiner	:	Prof LJS Baiyegunhi (University of KwaZulu-Natal)
External examiner	:	Dr ARA Abu Hatab (Swedish University of Agricultural Sciences, Sweden)

Malefo Mammoloro Boitshoko Lydia (in Biotechnology)

Thesis	:	Functional characterization of transgenic Arabidopsis plants overexpressing the maize Bowman-Birk serine protease inhibitor gene under biotic and abiotic stress
Supervisor	:	Dr BG Crampton
Co-supervisor	:	Prof BJ Vorster
Internal examiner	:	Prof DK Berger
External examiner	:	Prof E Venter (University of Johannesburg)
External examiner	:	Dr RD Hancock (James Hutton Institute, United Kingdom)

Mojekwu Tonna Onyekachukwu (in Genetics)

Thesis	:	The natural genetic resource in *Oreochromis mossambicus* and threats from invasive introgression
Supervisor	:	Dr TB Hoareau
Co-supervisor	:	Dr MJ Cunningham
External examiner	:	Prof ME D'Amato (University of the Western Cape)
External examiner	:	Dr CJP Firmat (National Institute of Agricultural Research, France)
External examiner	:	Dr DJ Penman (University of Stirling, United Kingdom)

Mostert Marja Mirjam (Genetics)

Thesis	:	Genomic consequences of natural and artificial selection in wild and advanced breeding populations of *Eucalyptus grandis*
Supervisor	:	Prof AA Myburg
External co-supervisor	:	Prof JOC Borevitz (Australian National University, Australia)
External co-supervisor	:	Dr JJ Acosta Jaramillo (North Carolina State University, United States of America)
External examiner	:	Dr A De La Torre (Northern Arizona University, United States of America)
External examiner	:	Dr D Grattapaglia (Brazilian Agricultural Research Corporation, Brazil)
External examiner	:	Dr S Yeaman (University of Calgary, Canada)

Nel Wilma Janine (Microbiology)

Thesis	:	Ophiostomatoid fungi associated with fungus farming insects in South Africa
Supervisor	:	Dr A Duong
Co-supervisor	:	Prof ZW de Beer
Co-supervisor	:	Prof MJ Wingfield
Internal examiner	:	Prof MPA Coetzee
External examiner	:	Prof M Kasson (West Virginia University, United States of America)
External examiner	:	Dr M Gryzenhout (University of the Free State)

Ngcamphalala Celiwe Angel (Zoology)

Thesis	:	Glucocorticoid responses to capture, captivity and high environmental temperatures among southern African birds
Supervisor	:	Prof AE McKechnie
Co-supervisor	:	Prof A Ganswindt
Co-supervisor	:	Prof SW Nicolson
External examiner	:	Prof LM Romero (Tufts University, United States of America)
External examiner	:	Dr R Ghosal (Ahmedabad University, India)
External examiner	:	Dr DC Koester (Cleveland Metroparks Zoo, United States of America)

Onyeoziri Isiguzoro Omenukoaku (in Food Science)

Thesis	:	Extrusion cooking of pearl millet: effects on sensory attributes of porridges made from pre-cooked flours
Supervisor	:	Prof HL de Kock
Co-supervisor	:	Prof JRN Taylor
External examiner	:	Prof SH Alavi (Kansas State University, United States of America)
External examiner	:	Dr AO Obilana (Cape Peninsula University of Technology)
External examiner	:	Dr GO Olatunde (Federal University of Agriculture, Nigeria)

Phasha Mmatshepho Malekgale (in Microbiology)

Thesis	:	Functional characterization of pathogenicity genes in *Fusarium circinatum*
Supervisor	:	Prof ET Steenkamp
Co-supervisor	:	Prof MPA Coetzee
Co-supervisor	:	Prof BD Wingfield
Co-supervisor	:	Prof MJ Wingfield
Internal examiner	:	Prof N van den Berg
External examiner	:	Prof S Kang (Penn State University, United States of America)
External examiner	:	Prof BÅ Olson (Swedish University of Agricultural Sciences, Sweden)

Queffelec Joséphine (in Genetics)

Thesis	:	Influence of reproductive biology on the invasion dynamics of *Sirex noctilio*
Supervisor	:	Prof B Slippers
Co-supervisor	:	Prof JM Greeff
Co-supervisor	:	Dr JD Allison
Internal examiner	:	Prof RM Crewe
External examiner	:	Prof C Stauffer (University of Natural Resources and Life Sciences, Austria)
External examiner	:	Dr MZ Ahmed (United States Department of Agriculture, United States of America)

Tola Yosef Hamba (Genetics)

Thesis	:	Characterization of the honey bee and stingless bee gut microbiota: A hidden diversity and host-specific microbiomes from sub-Saharan-African region
Supervisor	:	Prof B Slippers
External co-supervisor	:	Dr JC Paredes Escobar (International Centre of Insect Physiology and Ecology, Kenya)
Internal examiner	:	Dr AA Yusuf
External examiner	:	Prof M Kaltenpoth (Max Planck Institute for Chemical Ecology, Germany)
External examiner	:	Dr HMG Lattorff (International Centre of Insect Physiology and Ecology, Kenya)

Toukem Nadia Karelle (Entomology)

Thesis	:	An integrated pest and pollinator management approach for smallholder avocado (*Persea americana* Mill.) farms under different landscape contexts
Supervisor	:	Dr AA Yusuf
External co-supervisor	:	Dr TLM Dubois (International Centre of Insect Physiology and Ecology, Kenya)
External examiner	:	Dr F Chidawanyika (University of the Free State)
External examiner	:	Dr MGA Tamò (International Institute of Tropical Agriculture, Benin)
External examiner	:	Dr P Theodorou (Martin-Luther-University of Halle-Wittenberg, Germany)

Wandja Kamgang Vanessa (Zoology)

Thesis	:	New insights into the reproductive behaviour and its endocrine correlates in the roan antelope (*Hippotragus equinus*) for captive management
Supervisor	:	Prof A Ganswindt
Co-supervisor	:	Prof NC Bennett
External co-supervisor	:	Dr AC van der Goot (Lapalala Wilderness)
Internal examiner	:	Prof CG Faulkes
External examiner	:	Prof EZ Cameron (University of Canterbury, New Zealand)
External examiner	:	Dr LC Metrione (South-East Zoo Alliance for Reproduction & Conservation, United States of America)

Webster Andrea Bea (Zoology)

Thesis : **Non-invasive assessment of trace elements to evaluate African savannah ecosystem health**
Supervisor : Prof A Ganswindt
Co-supervisor : Prof NC Bennett
Internal examiner : Prof MS Bornman
External examiner : Prof J Legler (Utrecht University, The Netherlands)
External examiner : Prof LN Vandenberg (University of Massachusetts Amherst, United States of America)

Master of Agriculture
Animal Production Management

De Bruyn Sonya

Dissertation : **Reproductive and body size measurements in a cohort of roan- and sable antelope (*Hippotragus equinus & -niger*) in South Africa**
Supervisor : Dr KN Koeppel
Co-supervisor : Prof DE Holm
Internal examiner : Prof HJ Bertschinger
External examiner : Prof M Mwanza (North-West University)

Extension

Mente Nokulunga

Dissertation : **Factors influencing irrigation management decision making: The case of Taung Irrigation Scheme in North West Province of South Africa**
Supervisor : Dr JB Stevens
External examiner : Prof DB Afful (University of Limpopo)
External examiner : Prof FS Lategan (Nelson Mandela University)

Master of Agricultural Science
Agricultural Economics

Atieno Prisca
Banda Chikumbutso Katukula
Chitekwere Brown
Hattingh Jodie
* **Kaango** Eugine
* **Maseko** Sulinkhundla
Miller Taaibah
Mndzebele Mancoba Knowledge
Mpande Brian
Mwangomba Wantwa
Ngalande Nashon
Nsakilwa Musowe
Odhiambo Valiant Otieno

Agronomy

Magwaza Siboniso Ntabeni

Dissertation : **Application of long-term trial data and crop modelling to inform the ecological intensification of wheat (*Triticum aestivum L.*) production**
Supervisor : Prof M van der Laan
Co-supervisor : Dr D Marais
External examiner : Dr O Crespo (University of Cape Town)
External examiner : Mr MR Jones (South African Sugarcane Research Institute)

* **Raphela** Arnold Lesetja

Dissertation	:	**Improving crop productivity with an organic crop enhancer**
Supervisor	:	Dr D Marais
External examiner	:	Prof MM Slabbert (Tshwane University of Technology)
External examiner	:	Dr MP Bopape-Mabapa (University of Limpopo)

Shabangu Nhlanhla Mncedisi

Dissertation	:	**Effect of long-term inorganic fertilizer combinations on weed abundance and diversity in maize**
Supervisor	:	Dr D Marais
Co-supervisor	:	Prof BJ Vorster
External examiner	:	Dr E Hugo (Syngenta)
External examiner	:	Dr N Mashingaidze (University of the Free State)

in Animal Science: Animal Nutrition

Van der Westhuizen Rudie Hermann

Dissertation	:	**Performance and gut microbiome diversity of broilers supplemented with a single strain *Bacillus subtilis* probiotic and a multi-complex carbohydrase**
Supervisor	:	Dr C Jansen van Rensburg
Internal examiner	:	Dr TT Nkukwana
External examiner	:	Prof PA Iji (Fiji National University, Fiji)

Animal Science
Animal Nutrition

Greeff Ivan Hardus

Dissertation	:	**Effect of level of urea supplementation on performance and rumen fermentation dynamics in feedlot lambs**
Supervisor	:	Prof LJ Erasmus
Co-supervisor	:	Dr CJL du Toit
Internal examiner	:	Prof JB Jansen van Ryssen
External examiner	:	Dr PH Henning (Meadow Feeds)

Olaniyi Michael Olanrewaju

Dissertation	:	**Effect of plant extracts used as a methane mitigation additive on carcass fat content and fatty acid composition of South African Merino sheep**
Supervisor	:	Prof EC Webb
Co-supervisor	:	Prof A Hassen
Internal examiner	:	Dr CJL du Toit
External examiner	:	Dr HA O'Neill (University of the Free State)

Animal Science
Production Physiology and Product Quality

Duvenage Twanette

Dissertation	:	**Fat content and fatty acid composition of South African Wagyu beef**
Supervisor	:	Prof EC Webb
External examiner	:	Prof A Hugo (University of the Free State)
External examiner	:	Dr L Frylinck (Agricultural Research Council)

* **Honneysett** Kayla Morgan

Dissertation	:	**Porcine embryo development and cryopreservation**
Supervisor	:	Dr A Maqhashu
Co-supervisor	:	Prof EC Webb
Internal examiner	:	Prof A Hassen
External examiner	:	Dr HA O'Neill (University of the Free State)
External examiner	:	Mr MB Raito (Central University of Technology)

Krynauw Johanna Catharina

Dissertation : The effect of flush feeding during lactation on sow reproductive efficiency, litter size, birth weight and within litter variation

Supervisor : Prof EC Webb

External co-supervisor : Dr LJ Zak (Topigs Norsvin Research Center B.V., The Netherlands)

Internal examiner : Dr A Maqhashu

External examiner : Dr NM Soede (Wageningen University, The Netherlands)

Morris Jarred Daniel

Dissertation : Effects of dietary energy levels and supplemental rumen protected fat on growth performance and carcass characteristics of feedlot bulls fed Zilpaterol diets

Supervisor : Prof EC Webb

Co-supervisor : Dr CJL du Toit

Internal examiner : Prof LJ Erasmus

External examiner : Prof DU Thomson (Iowa State University, United States of America)

Pasture Science

Van Antwerpen Philmi

Dissertation : The effects of selected constituents of potential concern on maize (*Zea mays*) and soya (*Glycine max*) grown on siliceous coal ash and organic waste ameliorated soil

Supervisor : Prof WF Truter

External co-supervisor : Dr T Morgenthal (Department of Agriculture, Land Reform and Rural Development)

External examiner : Prof LF Petrik (University of the Western Cape)

External examiner : Dr AO Odindo (University of KwaZulu-Natal)

Plant Pathology

* Loots Maike

Dissertation : Microbial risk factors with macadamia nut (*Macadamia integrifolia*) production and processing in South Africa

Supervisor : Prof L Korsten

Co-supervisor : Dr L Chidamba

External examiner : Prof K Kniel-Tolbert (University of Delaware, United States of America)

External examiner : Prof M Uyttendaele (Ghent University, Belgium)

Master of Consumer Science
Clothing Management

* Van der Hout Maria Cathalina

Dissertation : The interrelationship between luxury value perceptions, sustainability excellence and purchase intentions towards exotic leather products: a comparative analysis among American and Chinese consumers

Supervisor : Dr NC Sonnenberg

Co-supervisor : Prof HM de Klerk

External examiner : Dr M Strydom (University of South Africa)

External examiner : Dr N le Roux (North-West University)

Food Management

* **Hodgson** Erin Ashley
Dissertation : **Consumer prioritisation of product-related attributes within the breakfast cereal category**
Supervisor : Dr JMM Marx-Pienaar
Co-supervisor : Dr BM Jacobs
External examiner : Dr N Cronje (University of the Free State)
External examiner : Dr N le Roux (North-West University)

Master of Science
Biochemistry

Els Fiona
Dissertation : **Genetic manipulation of *Plasmodium falciparum* for conditional knockdown of potassium channels**
Supervisor : Dr J Niemand
Co-supervisor : Prof L Birkholtz
Internal examiner : Prof W Schubert
External examiner : Dr M de Villiers (Stellenbosch University)

Biotechnology

* **Dlangalala** Manana
Dissertation : **Molecular detection, quantification and characterization of extended-spectrum β-lactamase (ESBL)- and AmpC-encoding genes in a cucumber agroecosystem**
Supervisor : Prof L Korsten
Co-supervisor : Dr EM du Plessis
Co-supervisor : Dr S Duvenage
External examiner : Prof MAA El-Shenawy (National Research Center, Egypt)
External examiner : Prof AI Okoh (University of Fort Hare)

Entomology

Koka Mmatlala Dorothy
Dissertation : **Annual cycle and morphology of lice parasitizing two sympatric African small mammals (*Micaelamys namaquensis* and *Elephantulus myurus*)**
Supervisor : Dr H Lutermann
External examiner : Prof LA Durden (Georgia Southern University, United States of America)
External examiner : Prof S Matthee (Stellenbosch University)

Environmental Ecology

Taylor Liezl

Genetics

* **Bishop** Laura Jane
Dissertation : **Development of a high-throughput diagnostic screening tool to monitor the status of amitraz resistance and genotype in the cattle tick, *Rhipicephalus microplus***
Supervisor : Prof C Maritz-Olivier
Co-supervisor : Prof MC Oosthuizen
Co-supervisor : Dr NE Collins
Internal examiner : Dr MC Marufu
External examiner : Dr M Joshi (University of KwaZulu-Natal)

Hanneman Juanita Joyce

Dissertation	:	Analyses of the *in vitro* effects of phosphite on *Phytophthora cinnamomi* isolates
Supervisor	:	Prof N van den Berg
Co-supervisor	:	Dr SA Prabhu
Co-supervisor	:	Miss J Engelbrecht
External examiner	:	Prof A McLeod (Stellenbosch University)
External examiner	:	Dr M Gryzenhout (University of the Free State)

Henning Johannes Stephanus

Dissertation	:	Genome-wide diversity assessment for genetic resource management of *Eucalyptus dunnii, E. grandis, E. nitens* and *E. urophylla*
Supervisor	:	Prof AA Myburg
Co-supervisor	:	Prof NA van der Merwe
External examiner	:	Dr M Byrne (Department of Biodiversity, Conservation and Attractions, Australia)
External examiner	:	Dr DA Steane (University of Tasmania, Australia)

* Khoete Lomile

Dissertation	:	Population genetic tools for *Gonipterus* sp. 2 and its egg parasitoid A*naphes nitens*
Supervisor	:	Prof MPA Coetzee
Co-supervisor	:	Prof I Barnes
Co-supervisor	:	Prof BP Hurley
Co-supervisor	:	Prof B Slippers
Co-supervisor	:	Dr ML Schroder
Internal examiner	:	Prof BD Wingfield
External examiner	:	Dr H Nahrung (University of the Sunshine Coast, Australia)

Majaja Pozisa Sinayo

Dissertation	:	*Fusarium* species diversity from maize and teff in the northern Free State
Supervisor	:	Prof NA van der Merwe
Co-supervisor	:	Dr N Yilmaz Visagie
Internal examiner	:	Dr PM Wilken
External examiner	:	Prof K Jacobs (Stellenbosch University)

* Smit Michaela Shannon

Dissertation	:	Development of a high-throughput diagnostic screening tool to monitor the status of pyrethroid resistance in the cattle tick, *Rhipicephalus microplus*
Supervisor	:	Prof C Maritz-Olivier
Co-supervisor	:	Prof MC Oosthuizen
Co-supervisor	:	Dr NE Collins
External examiner	:	Prof XJ Zhou (University of Kentucky, United States of America)
External examiner	:	Dr MA Adeleke (University of KwaZulu-Natal)

* Wilson Shannon Kathleen

Dissertation	:	Systemic defence responses induced by *Chrysoporthe austroafricana* in *Eucalyptus grandis*
Supervisor	:	Prof S Naidoo
External co-supervisor	:	Dr LS Shuey (Department of Agriculture and Fisheries, Australia)
Internal examiner	:	Prof TA Coutinho
External examiner	:	Prof P Bonello (The Ohio State University, United States of America)

in Microbiology

* Kleinhans Nadine

Dissertation	:	Engineering of African horse sickness virus vaccine candidates by targeting the VP4 protein responsible for capping and methylation of viral mRNA
Supervisor	:	Prof J Theron
Internal examiner	:	Dr TE Motaung
External examiner	:	Prof N Potgieter (University of Venda)

Microbiology

* **Arnold** Danielle Patricia

Dissertation	:	Development of a recombinant adenoviral immunocontraceptive vaccine (Ad-GKT) for use in domestic dogs
Supervisor	:	Prof LH Nel
Co-supervisor	:	Dr N Wright
Internal examiner	:	Prof EH Venter
External examiner	:	Dr DL Horton (University of Surrey, United Kingdom)

* **Townsend** Garyn Ross

Dissertation	:	Initial assessment of the Polyphagous Shot Hole Borer (PSHB) in indigenous afrotemperate forests
Supervisor	:	Prof ZW de Beer
External co-supervisor	:	Prof MP Hill (Rhodes University)
External co-supervisor	:	Prof F Roets (Stellenbosch University)
Internal examiner	:	Prof MP Robertson
External examiner	:	Dr S Freeman (The Volcani Center, Israel)

Nutrition

Kapp Dianré

Dissertation	:	Development and assessment of a diabetes nutrition education DVD for low literacy level adults living with diabetes
Supervisor	:	Miss GJ Gericke
Co-supervisor	:	Dr JW Muchiri
Internal examiner	:	Miss N de Villiers
External examiner	:	Ms MM Bopape (University of Limpopo)

in Plant Pathology

Coetzee Charlene

Dissertation	:	Bacterial dynamics and the prevalence of foodborne pathogens associated with the avocado fruit, *Persea americana* Mill. in a food processing facility, a case study
Supervisor	:	Prof L Korsten
Co-supervisor	:	Dr EM du Plessis
Co-supervisor	:	Dr S Duvenage
External examiner	:	Prof SA Micallef (University of Maryland, United States of America)
External examiner	:	Dr M Sharma (United States Department of Agriculture, United States of America)

Plant Pathology

Ratshilingano Tshidino Muneiwa

Dissertation	:	Determining the microbiological safety of commercially produced lettuce and spinach
Supervisor	:	Prof L Korsten
Co-supervisor	:	Dr EM du Plessis
Co-supervisor	:	Dr S Duvenage
External examiner	:	Prof GO Sigge (Stellenbosch University)
External examiner	:	Dr M Sharma (United States Department of Agriculture, United States of America)

in Plant Science

Ntshangase Sinethemba Nombulelo

Dissertation	:	An assessment of the anatomical and genetic diversity of *Themeda triandra* Forssk.
Supervisor	:	Prof NP Barker
Co-supervisor	:	Prof WF Truter
External examiner	:	Prof GA Verboom (University of Cape Town)
External examiner	:	Dr MS Vorontsova (Royal Botanic Gardens Kew, United Kingdom)

Plant Science

* Gouws Charné Aniska

Dissertation	:	Biotic and abiotic drivers of fine scale variation in the performance of a dominant sub-Antarctic grass species
Supervisor	:	Dr PC le Roux
Co-supervisor	:	Dr NS Haussmann
External examiner	:	Dr A Filazzola (University of Alberta, Canada)
External examiner	:	Dr C Kleier (Regis University, United States of America)

Mathibela Elizabeth Ofentse

Dissertation	:	The impact of delayed nodule senescence by tissue-specific cysteine protease inhibitor expression in soybean [*Glycine max* (L.) Merr.] development and response to abiotic stress
Supervisor	:	Prof BJ Vorster
External examiner	:	Dr U Schlüter (Heinrich Heine University Düsseldorf, Germany)
External examiner	:	Dr C van der Vyver (Stellenbosch University)

Soil Science

Thakali Pati Peter

Dissertation	:	Improving water and nitrogen use efficiency of green maize using simple tools and the Soil Water Balance model
Supervisor	:	Dr AJ Sanewe
Co-supervisor	:	Prof JG Annandale
Co-supervisor	:	Prof RJ Stirzaker
External examiner	:	Prof W van Averbeke (Tshwane University of Technology)
External examiner	:	Dr M Fanadzo (Cape Peninsula University of Technology)

Water Resource Management

Albrecht Ulané Noëlle
* Chimhundi Jeremiah
Mametja Edwin
Ngobeni Vongani Vallery

Biyase Nokulunga Precious

Dissertation	:	Evaluation of the flow regime impacts on water quality in the Crocodile river catchment of Mpumalanga
Supervisor	:	Dr M Claassen
Internal examiner	:	Prof SN Venter
External examiner	:	Prof PJ Oberholster (University of the Free State)

Wildlife Management

Kudze Emily Norma

Dissertation	:	Species richness and modelled distribution of bats in Ghana
Supervisor	:	Dr M Keith
Co-supervisor	:	Dr ME van der Walt
External examiner	:	Prof MB Fenton (University of Western Ontario, Canada)
External examiner	:	Dr PW Webala (Maasai Mara University, Kenya)

Reynecke Frans

Dissertation	:	Assessing the efficacy of five commonly used snake and gecko repelling agents when applied outdoors
Supervisor	:	Dr M Keith
Co-supervisor	:	Dr AA Yusuf
External co-supervisor	:	Mr L Verburgt (Enviro-Insight CC)
External examiner	:	Dr T Hibbitts (Texas A&M University, United States of America)
External examiner	:	Dr A Shuttleworth (University of KwaZulu-Natal)

Zoology

Jepsen Emma Maeve

Dissertation	:	Non-invasive monitoring of a stress biomarker in captive and re-wilded tigers (*Panthera tigris*) in South Africa
Supervisor	:	Prof A Ganswindt
External co-supervisor	:	Dr J Scheun (University of South Africa)
External examiner	:	Dr R Ghosal (Ahmedabad University, India)
External examiner	:	Dr N Wielebnowski (Oregon Zoo, United States of America)

* **Oosthuizen** Tasha

Dissertation	:	Personality and foraging behaviour of Namaqua rock mice (*Micaelamys namaquensis*)
Supervisor	:	Dr H Lutermann
External examiner	:	Prof N Pillay (University of the Witwatersrand)
External examiner	:	Prof A le Roux (University of the Free State)

* **Roberts** Jessica Dorothy

Dissertation	:	Thermoregulatory behaviour and microhabitat use by Dune Larks in the Namib Sand Sea
Supervisor	:	Prof AE McKechnie
External co-supervisor	:	Dr SJ Cunningham (University of Cape Town)
External examiner	:	Prof AJF Craig (Rhodes University)
External examiner	:	Dr DM Harebottle (Sol Plaatje University)

Bachelor of Agricultural Science Honours

Crop Science

Gibson Steven Gordon
Knight Calvin

Bachelor of Science Honours

Bioinformatics

Nante Ruth

Food Science

Nzwana Zenani Miemie

Zoology

Damon Cheryldene Shirley
Osburn Kayla Rae

Bachelor of Agricultural Science
Animal Science

Kekana Tshego Angella

Applied Plant and Soil Sciences

Blignaut Dirk Johannes
Fundzo Abongile
Mokwena Jerry Mlapisi

Plant Pathology

Leighton Mikayla Ann

Bachelor of Consumer Science
Food Retail Management

Hanmonth Kiara

in Hospitality Management

Van der Merwe Carina

Bachelor of Science

Mostert Gerhard Stefan
Yeni Cwenga

Bachelor of Science
Biochemistry

Mahlangu Mandla Alfred
Phala Mantsomele Caroline

Biotechnology

Chimhandamba Ngonidzashe Jeff
Govender Sadashni
Stephens Reece

Food Science

Govender Aaron Cole
Haigh Angelique
Mathebe Itumeleng Marriat
Rammala Lefa Nkhesilo

Human Genetics

Jantjie Sibusiso
Mhlanga Belinda Thando
Ndlazi Thandolwethu

in Human Physiology

Rubin Benjamin Israel Matthew

Human Physiology

Lekhuleni Felicia Buhle Mpumelelo
Madiba Ntswaki Kimberlin
Meiring Chloe
Moloantoa Koketjo Jaquiline
Mphuthi Nokukhanya Valencia
Msiza Ulender Zinhle
Nxumalo Sbusisiwe Ntokazi Zamandwandwe
Phakathi Senzo Lucas
Tabane Tshegofatso Nomzamo Angelou

Human Physiology, Genetics and Psychology

Gwala Nonsindiso
Harman Nicola
Mapayila Batsebiye Reginah
Mbere Tshegofatso Nomakhosi Poppy
Mofokeng Rearabiloe Unity
Monyebodi Gillian Tlou
Morare Given Refilwe
Mosia Ikaheng
Mothapo Thato Paledi
Theuri Nyaruai Virginia
Van der Westhuizen Caitlin Chévaun
Van Dyk Emma Elizabeth
Van Eeden Salome
Zuma Nothile

Medical Sciences

Lethoba Katleho
Mlotshwa Njabulo
Pheko Khotsofalo Tsegofatso

in Microbiology

Motha Lindokuhle Sinclaire
Rikhotso Thembi Cosier

Microbiology

Pereira Siobhan Caitlin

Zoology

Neilon Stuart James

Citations

The degree Doctor of Philosophy

Istifanus Peni **Aiki**

In his thesis, **Diversity, nesting behaviour, thermoregulation and cephalic secretions of termites from two Nigerian savannahs**, the *promovendus* investigated the ecology and nesting behaviour of mound-building termites found in two savannah biomes. He developed a new identification key for mound-building termites using both workers' morphological characters and mound structures. The inclusion of mound structural features strengthened existing identification keys that use only soldiers' morphology. The thesis identified a strong association of the mound structures such as dome, cone, cathedral, and mushroom-shaped with the seven species of termites from the study area. To further address the taxonomic gap of termites from West Africa, he added a chemotaxonomic approach using chemical profiles of cephalic and cuticular secretions to identify termites to species level. His research deepens understanding of termite species' diversity and the variability of mound structures, chemical profiles, and morphology of termites from two savannahs in Nigeria.

The degree Doctor of Philosophy

Mahukpe Pascal **Ayelo**

In his thesis, **Identification of kairomones for the biological control of *Tuta absoluta* (Meyrick) and *Trialeurodes vaporariorum* (Westwood), two major pests of tomato *Solanum lycopersicum* L.**, the *promovendus* investigated how three natural enemies of two major tomato pests, *Tuta absoluta* and *Trialeurodes vaporariorum,* can be attracted to tomato plants. He examined behavioural responses of natural enemies to herbivore-induced plant volatiles (HIPVs) and host/prey-associated chemicals. He demonstrated that attraction of the natural enemies to HIPVs increases as the infestation density of *T. absoluta* increases, unlike the infestation by *Tr. vaporariorum*. Additionally, the specialist predators of these tomato pests showed higher sensitivity of detecting kairomones from HIPVs and host/prey's chemicals than generalists. His findings contribute to a better understanding of the kairomones used by the natural enemies to locate pests and their possible use in integrated pest management for tomato plants.

The degree Doctor of Philosophy

Bethelihem Mekonnen **Bekele**

In her thesis, **Semiochemicals from the African weaver ant *Oecophylla longinoda* (Hymenoptera: Formicidae) and their repellency on mango fruit flies**, the *promovenda* investigated the effect of ant chemical cues on the oviposition behaviour of fruit flies. She examined the effects of an ant's whole body extracts on the oviposition behaviours of *Bactrocera dorsalis* (an invasive pest) and *Ceratitis cosyra* (a native pest). The flies' oviposition behaviours were affected by abdominal extracts. By extracting Dufour's sternal, rectal and poison glands and exposing the flies to these, she demonstrated that Dufour's and poison gland extracts effectively influenced oviposition. For the first time, a gall midge parasitoid of the African weaver ants was also reported. Her findings contribute to a better understanding of ant-fruit fly interaction and pave the way for developing effective biocontrol methods for fruit flies using semiochemicals from ants.

The degree Doctor of Philosophy

Kelly Elizabeth **Brannan**

In her thesis, **Broiler performance and avian uncoupling protein mRNA expression during acute heat stress as influenced by thermal manipulation and dietary fat source**, the *promovenda* investigated the balance between broiler performance and heat stress management. She examined two interventions reported to improve thermotolerance as well as carcass composition. Meat birds selected for high growth and carcass yield are more susceptible to hyperthermia, which results in significant economic losses for producers. By applying prospective heat stress interventions to chickens in semi-commercial conditions, she demonstrated that heat stress adaptation does not support optimal broiler performance. Additionally, she established that avian uncoupling protein does not contribute to reduced oxidative damage for either heat stress strategy; however, a significant sexual dimorphism was noted for the protein expression and oxidative damage. Her findings contribute to a better understanding of heat stress and avian uncoupling protein in commercial chickens.

The degree Doctor of Philosophy

Iman Brema Hassaballa **Dawelbeit**

In her thesis, **Studies on sand fly resting habitats, plant feeding patterns and volatilome in a leishmaniasis endemic are of Kenya**, the *promovenda* explored phlebotomine sand fly ecology that causes leishmaniasis, vital to public health. Focusing on the leishmaniasis endemic area of Baringo County, Kenya, five interconnected research chapters addressed whether adult sand fly distribution varies in three different habitats used as resting sites, as well as the volatile organic compounds associated with these habitats. In addition to this, the *promovenda* identified sand fly host plants and potential semiochemical components from the volatiles of their host plants. Her findings indicated that volatile organic compounds might contribute to the structure of sand flies in associated habitats. By applying behavioural assays on sand flies, her results demonstrated that behavioural responses to plant-derived attractants could potentially be exploited as lures to improve Afrotropical sand fly surveillance and control.

The degree Doctor of Philosophy

Juanita **Engelbrecht**

In her thesis, **Population genetics and genomics of *Phytophthora cinnamomi*,** the *promovenda* studied the population biology and genomics of an important pathogen of forestry and crops worldwide. The *promovenda* developed a comprehensive set of microsatellite markers that can characterise the genetic diversity and population biology of *P. cinnamomi*. She applied this set of markers on a collection of *P. cinnamomi* isolates from avocado orchards and natural vegetations in four provinces of South Africa and provided insight into the genetic diversity and movement of the pathogen between these populations. A high-quality genome of *P. cinnamomi* was generated and characterised, which resulted in improved gene discovery, including essential pathogenicity-related genes. Overall, the research provided valuable contributions to understanding the biology and genomics of P. cinnamomi and deepened knowledge in the field of population genetics and genomics of oomycetes in general.

The degree Doctor of Philosophy

Quentin **Guignard**

In his thesis, **Visual and chemical ecology of *Sirex noctilio***, the *promovendus* investigated the visual and chemical basis of the globally invasive woodwasp *Sirex noctilio.* The thesis synthesises the knowledge on colour vision and pheromone communication in the *Symphyta*, a basal group of *Hymenoptera*. The study then used this knowledge to characterise the molecular basis of colour vision and pheromone communication in *S. noctilio*. Three genes responsible for colour vision were identified in the genome of this wasp, and its expression and light sensitivity were characterised. The study then compared the evolution of these genes across all insects and showed a correlation with key morphological traits such as simple eyes and life history. Finally, the *promovendus* characterised four compounds constituting a male pheromone, its production and its antennal sensitivity. The study advances knowledge of vision and chemical communication in *Symphyta* and *Hymenoptera* in general and has applied value for the surveillance and management of *S. noctili*o.

The degree Doctor of Philosophy

Minette **Havenga**

In her thesis, **Biology and pathology of the *Eucalyptus* foliar pathogen *Teratosphaeria*** *destructans*, the *promovenda* used genomic and transcriptomic approaches to investigate the reproductive strategy of *T. destructans*, its potential to generate novel genetic combinations in several global populations, to assess genes involved in pathogenicity and virulence, and identify genes involved in signalling for compatible sexual partners. Specific mating types and microsatellite markers for population genetic analyses of this important *eucalyptus* pathogen were developed. The mating-type (*MAT*) markers were successfully used to determine the *MAT* idiomorphs for several other *Teratosphaeria* species, and the microsatellites were developed into a rapid diagnostic assay for six *Teratosphaeria* foliar pathogens. In addition, baseline transcriptomic studies were undertaken to investigate pheromone expression patterns and putative pathogenicity-gene pathways. This research represents a solid foundation to understand the global movement, sexual recombination, and pathology of this devastating tree pathogen.

The degree Doctor of Philosophy

Rowan Keith **Jordaan**

In his thesis, **The demography and sociality of killer whales, *Orcinus orca*, at subantarctic Marion Island**, the *promovendus* investigated the potential demography and social structure drivers for this population. Demographic findings for this population are new and serve as a baseline and for comparison to other populations. Survival was found to be positively influenced by increased levels of sociality and increased Patagonian toothfish *Dissotichus elegenoides* fishery effort in surrounding waters, but not by the abundance of natural prey. Additionally, the *promovendus* established that natural prey abundances had no influence on the calving rate of killer whales, and toothfish fisheries did not influence social structure or calving rate. Further analysis suggested that killer whales vary social structure in response to the type and abundance of their natural prey. His findings showed that killer whales at Marion Island adjust social structure in response to prey availability and that social structure is an essential determinant of survival in this population.

The degree Doctor of Philosophy

Mubanga Hellen **Kabwe**

In her thesis, **Metagenomic analysis of the South African human gut microbiome**, the *promovenda* characterised gut microbiomes from urban and rural South Africans. The study employed amplicon sequencing of the internal transcribed spacer (ITS) gene region and shotgun metagenomics to elucidate fungi and microbial functional capacity. Phylogenetic analysis showed that *Pichia* were an important mycobiota in the guts of South Africans. Statistical analysis revealed that geographic locality was a major determinant of gut mycobiota and suggested that other factors, including cigarette smoking and breastfeeding, may be determinants of gut mycobiota, albeit to a lower extent. This study also provided evidence of potential biomarker fungal taxa in urban and rural mycobiota, respectively. The analysis of functional genes revealed that antimicrobial resistance (AMR) profiles were geography-specific and correlated with some multi-AMR taxa resistance profiles. Factors such as age and gender appear to significantly influence AMR gene diversity in the gut microbiomes of South Africans. This study provides the first large-scale dataset profiling South African gut microbiomes.

The degree Doctor of Philosophy

Caroline Wanjiku **Kung'u**

In her thesis, **Biological traits, plant sugar feeding patterns and chemical ecology of *Aedes aegypti***, the *promovenda* investigated biological characteristics and plant-sugar feeding behaviour of *Ae. aegypti* from two areas of contrasting dengue endemicity in Kenya and plant-derived attractants for field monitoring of the vector species. She examined differences in body size and energy reserves: biological traits, seasonality in plant feeding, the composition of sugars acquired from plant feeding, plant sources of sugar meals and field trapping potential of a blend of compounds derived from one of the identified host plants. Using chemical, molecular, and field ecology tools, she demonstrated that variations in biological traits might contribute to scale differences in the vectorial capacity of *Ae. aegypti*. The vector feeds on various plants, acquiring a broad range of sugars varying by sex and season. The findings increase understanding of the biology, behaviour and ecology of *Ae. aegypti.*

The degree Doctor of Philosophy

Mapula Hildah **Lefophane**

In her thesis, **The effects of information communication technology policy alternatives on South Africa's agro-processing industries**, the *promovenda* studied the extent to which the contribution of the agro-processing industries to the economy could be strengthened by leveraging information and communications technology (ICT) investment. She used an ICT-intensity index to develop a database on the ICT intensity of agro-processing industries. Using this database, she performed various econometric analyses to ascertain whether industries that had invested more in ICT contributed more to growth in labour productivity, output and employment. Her findings proved that the contribution of ICT investment to growth would take time to materialise. In addition, it made several other contributions, including how long it would take for ICT-led growth to manifest among industries and the identification of industries that would exhibit higher growth through ICT-related investment. Overall, her thesis ascertained that ICT investment could contribute to addressing some of the economic challenges facing South Africa.

The degree Doctor of Philosophy

Mammoloro Boitshoko Lydia **Malefo**

In her thesis, **Functional characterization of transgenic Arabidopsis plants overexpressing the maize Bowman-Birk serine protease inhibitor gene under biotic and abiotic stress**, the *promovenda* studied the molecular mechanisms of serine protease inhibitors in enhancing tolerance to biotic and abiotic stresses. Her study provides the first analysis of Bowman-Birk Inhibitor (BBI) gene overexpression profiling in stress occurring individually and in combination. Arabidopsis plants overexpressing a maise serine protease inhibitor, BBI, were assessed for physiological and biochemical responses to drought stress. A significant finding in the study is that BBI-expressing plants exhibit better performance under drought stress. BBI was also assessed under pathogen infection. Leaf inoculation studies revealed that Arabidopsis plants expressing BBI experience delayed disease symptoms and decreased leaf chlorophyll accumulation. Her work indicates that BBI modulates the defence response of plants to abiotic and biotic stresses by regulating cellular oxidative stress to both biotic and abiotic stress occurring individually and in combination.

The degree Doctor of Philosophy

Tonna Onyekachukwu **Mojekwu**

In his thesis, **The natural genetic resource in *Oreochromis mossambicus* and threats from invasive introgression**, the *promovendus* observed that the diversity in *Oreochromis* using mitochondrial cytochrome oxidase subunit1 (mtDNA-CO1) of wild native origin showed misidentification, cryptic diversity, hybridisation between feral populations, and introgression. The *promovendus* discovered 55 genes linked to a microsatellites marker that was effective when eight of them were used to detect hybrid in *O. mossambicus*. The study developed an exome gene-capture panel from the genome of *O. niloticus* for accurate estimation of admixtures in Pseudocrenilabrinae. This study improves the knowledge of taxonomy and biodiversity in *Oreochromis* and provides a reliable approach for introgressive hybridisation detection for conservation.

The degree Doctor of Philosophy

Marja Mirjam **Mostert**

In her thesis, **Genomic consequences of natural and artificial selection in wild and advanced breeding populations of *Eucalyptus grandis***, the *promovenda* interrogated the genomes of a widely cultivated forest tree species to uncover genetic footprints of natural and artificial selection and, in preparation for future climates, identified untapped, wild diversity for genetic infusion into existing breeding programmes. To reveal how *E. grandis* responds to changing environments and selection pressures, the fine-scale population structure of the natural species range was investigated in terms of neutral and adaptive genetic variation. Advanced *E. grandis* breeding populations were interrogated to reveal how a century of domestication has affected the genetic population structure of the species and to decipher the genomic consequences of artificial selection for economic traits. This research represents the first steps in developing applied landscape genomics models by integrating ecology and population genomics to predict which genotypes will perform best under particular environmental conditions.

The degree Doctor of Philosophy

Wilma Janine **Nel**

In her thesis, **Ophiostomatoid fungi associated with fungus farming insects in South Africa**, the *promovenda* presented research on the symbiosis between ambrosia beetles, termites, and fungi. This study provided a comprehensive list of *Scolytinae* and *Platypodinae* species from South Africa and reported 25 species from the country for the first time. The study identified nine fungal species, from which two new genera and five new species were described, and two species were found in South Africa for the first time. Additionally, Ophiostomatalean fungi were detected for the first time in the fungus-farming termite system. Finally, using comparative genomics methods, the researcher determined changes to the genomes of the arthropod mutualistic fungi associated with this unique lifestyle. This study provides a substantial contribution to knowledge on the diversity of ambrosia beetles and their fungi in South Africa and provides a better understanding of the molecular evolution of the arthropod mutualistic *Sordariomycetes*.

The degree Doctor of Philosophy

Celiwe Angel **Ngcamphalala**

In her thesis, **Glucocorticoid responses to capture, captivity and high environmental temperatures among southern African birds**, the *promovenda* investigated endocrine responses associated with avian stress. The research is directly relevant to several areas of inquiry, including animal welfare and species' sensitivity to climate change. Novel insights are provided into stress responses to capture, including how the magnitude of increases in circulating levels of the major avian stress hormone, corticosterone, differs across species and between seasons in five common southern African birds. The thesis also significantly advances our capacity to non-invasively monitor stress levels in southern African birds and critically assess the potential of this technique for experimentally investigating birds' physiological responses to periods of hot weather. Overall, the research represents a significant step forward in the integration of endocrinology into ongoing efforts to predict the impact of climate change on birds.

The degree Doctor of Philosophy

Isiguzoro Omenukoaku **Onyeoziri**

In his thesis, **Extrusion cooking of pearl millet: effects on sensory attributes of porridges made from pre-cooked flours**, the *promovendus* studied the impact of extrusion-cooking on the sensory attributes of porridges prepared from stored wholegrain and decorticated/refined pearl millet flours by using a commercial-type electrically-heated twin-screw extruder and a low-cost friction-heated single-screw extruder. Pearl millet flour undergoes lipid hydrolysis and oxidation resulting in off-aromas and flavours, typically within two weeks of storage. Extrusion-cooking could potentially improve flour stability by inactivating flour lipases and retarding free fatty acid oxidation. Porridges made from the flours showed increased intensities of desirable aromas and flavours following flour extrusion-cooking and remained stable for up to six months of flour storage. Thermally-induced reactions were responsible for flavour development, inactivation of lipolytic enzymes, and degradation of potential goitrogenic factors. The study confirms that the effects on the sensory attributes depend on extrusion-cooking conditions. These must be optimised to produce convenient, ready-to-eat, safe foods from pearl millet flour with improved sensory quality and stability.

The degree Doctor of Philosophy

Mmatshepho Malekgale **Phasha**

In her thesis, **Functional characterization of pathogenicity genes in *Fusarium circinatum***, the *promovenda* investigated the role of putative pathogenicity genes during pine infection by the fungus *Fusarium circinatum*. A literature review was presented, in which the role of pathogenicity and virulence factors of filamentous fungal phytopathogens were discussed. The review also discussed current methods used to identify and characterise fungal pathogenesis genes and the need to adapt these methods to study the genes in economically important fungi. Research presented in this thesis utilised genetic engineering methods to investigate the role of growth and a mycotoxin gene during *Pinus patula* infection by *F. circinatum*. The study found that both genes contributed to the virulence of the fungus. Additional pathogenicity genes were also identified. These findings increase knowledge of the molecular basis and mechanisms of pathogenesis in *F. circinatum*, and the data presented will foster improved.

The degree Doctor of Philosophy

Joséphine **Queffelec**

In her thesis, **Influence of reproductive biology on the invasion dynamics of *Sirex noctilio***, the *promovenda* examined aspects of the reproductive biology of the invasive woodwasp *Sirex noctilio*. She investigated changes in sex ratio in the South African populations of the wasp, the effect of age and size on mating success, and the potential influence of bacterial reproductive parasites in *S. noctilio*. She demonstrated that after introduction in South Africa, female *S. noctilio* invested disproportionally more in sons than in daughters. Furthermore, she demonstrated that both size and age influence mate choice in *S. noctilio*. Finally, she proved that *S. noctilio* in South Africa is unlikely to be infected with *Wolbachia* but that the wasp's genome contains pseudogenes from the bacterial symbiont. This thesis illustrates the importance of understanding reproductive biology for monitoring and managing invasive species and implementing biological control programmes using insects as biological control agents.

The degree Doctor of Philosophy

Yosef Hamba **Tola**

In his thesis, **Characterization of the honey bee and stingless bee gut microbiota: A hidden diversity and host-specific microbiomes from sub-Saharan-African region**, the *promovendus* investigated the structures and diversity of gut microbiota in sub-Saharan Africa populations of the honey bee and stingless bee species. All the known core gut microbiota members were recorded in the African honey bee populations. The study showed that factors such as altitude and humidity potentially impact the abundance of some microbiota members of honey bees. Unlike populations from temperate regions of the world, it was noted that the sampled populations in Africa harbour lower densities of the bacterium *Lactobacillus.* In the eight species of stingless bees investigated, the study revealed a significant continent-specific and host intra-species diversity, with each stingless bee species having a distinct gut bacteria composition. The study also developed a protocol for laboratory rearing of mono-inoculated bees. Insights from this study will guide the development of potential probiotics to improve bee health, resistance to pests and pathogens, nutrition, and resilience against climate change.

The degree Doctor of Philosophy

Nadia Karelle **Toukem**

In her thesis, **An integrated pest and pollinator management approach for smallholder avocado (*Persea americana* Mill.) farms under different landscape contexts**, the *promovenda* investigated interactions between integrated pest management (IPM) and honeybee introduction using a strategy called integrated pest and pollinator management (IPPM) on avocado yield in smallholder farms in Kenya. Pests, the oriental fruit fly, and false codling moth were suppressed and resulted in a significant yield increase across the low, medium, and high landscape vegetation productivity classes. The IPM strategy did not synergistically increase yield but could provide additional incomes to farmers through beekeeping products or pollinator resources and pest biological control. The research also emphasised the vital role of non-honeybee insects in avocado pollination, increasing productivity. This thesis improved understanding of the IPM strategy and provided better tools to small farmers on cost-effective and environmentally friendly practices that increase quantitative and qualitative avocado yield.

The degree Doctor of Philosophy

Vanessa **Wandja Kamgang**

In her thesis, **New insights into the reproductive behaviour and its endocrine correlates in the roan antelope (*Hippotragus equinus*) for captive management**, the *promovenda* provided a detailed description of the reproductive behaviours and its endocrine correlates in the roan antelope, an endangered species in southern Africa. Behavioural observations and faecal samples collected non-invasively were used to quantify faecal steroid metabolites concentrations during key reproductive events in both males and females to assess the levels of reproductive and stress-related hormones concerning reproductive activity and ecological seasons. This study provided a detailed ethogram of the reproductive behaviour of the roan antelope and related information on their reproductive endocrinology and established non-invasive methods to monitor reproductive and stress-related hormones in this species. It demonstrated that faecal steroid analysis is a valuable non-invasive tool for monitoring the roan antelope's reproductive processes and responses to stressors.

The degree Doctor of Philosophy

Andrea Bea **Webster**

In her thesis, **Non-invasive assessment of trace elements to evaluate African savannah ecosystem health**, the *promovenda* developed a non-invasive framework for the simultaneous detection and assessment of 20 trace elements across 17 different species of terrestrial mammals living in protected areas of South Africa's savannah biome. Following the inductively coupled plasma-mass spectrometry method optimisation, trace elements in sediment and vegetation from two protected areas were examined and compared. Using non-invasively collected faecal samples from 21 different mammalian species, trace element concentration differences in herbivores, omnivores and carnivores were compared against measured concentrations in the environment. This is the first study to assess trace element concentrations in a wide variety of free-ranging African wildlife species occupying different trophic levels in terrestrial ecosystems. The non-invasive approach provides an alternative method to typically invasive, often lethal environmental monitoring strategies and lays the foundation for multiple avenues of ecotoxicological research in wildlife.

E&OE

National anthem | Nasionale lied | Koša ya Setšhaba

Nkosi sikelel' iAfrika

Maluphakanyisw' uphondo lwayo,

Yizwa imithandazo yethu,

Nkosi sikelela, thina lusapho lwayo.

Morena boloka setjhaba sa heso,

O fedise dintwa le matshwenyeho,

O se boloke, O se boloke setjhaba sa heso,

Setjhaba sa South Afrika – South Afrika.

Uit die blou van onse hemel,

Uit die diepte van ons see,

Oor ons ewige gebergtes,

Waar die kranse antwoord gee,

Sounds the call to come together,

And united we shall stand,

Let us live and strive for freedom,

In South Africa our land.

Director: Department of Enrolment and Student Administration | Direkteur: Departement Toelating en Studenteadministrasie | Molaodimogolo: Kgoro ya Ngwadišo le Taolo ya Baithuti

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