



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY

DIPLOMA- EN GRADEPLEGTIGHEDE: DESEMBER 2011

DIPLOMA AND GRADUATION CEREMONIES: DECEMBER 2011

UMSITHO WOTHWESO-ZIDANGA NEEDIPLOMA: DISEMBA 2011



DIE FAKULTEIT NATUURWETENSKAPPE

THE FACULTY OF SCIENCE

IFAKHALTHI YOBUNZULULWAZI KWEZOBUGQI

*Tweede Plegtigheid/ Second Ceremony/ uMsitho Wesibini*

# PROGRAM VIR DIE TWEEDE PLEGTIGHEID

## DIE FAKULTEIT NATUURWETENSKAPPE

*'n Vriendelike beroep word op alle aanwesiges gedoen om selfone af te skakel en nie die saal tydens die plegtigheid te verlaat nie en sodoende te verseker dat die verrigtinge sonder ontwrigting verloop.*

1. Akademiese prosesie kom die saal binne. U word versoek om te staan terwyl hulle die saal binnekom en te bly staan vir die sing van die Nasionale Lied.
2. Sing van die Nasionale Lied (kyk binneagterblad). Neem asseblief daarna u sitplekke in. Begeleiding: Stellenbosch Simfoniese Blaasensemble onder leiding van Pamela Kierman. Voorsanger: André Howard.
3. Konstituering deur die Kanselier.
4. Gebed deur dr Natie Philander.
5. Verwelkoming deur die Kanselier.
6. Voorstelling van diplomandi en graduandi deur die dekaan van die betrokke fakulteit en toekenning van diplomas en grade deur die Kanselier.
7. Sluiting deur die Kanselier.
8. Akademiese prosesie verlaat die verhoog.

*Die aanwesiges word versoek om te bly staan totdat die akademiese prosesie uitgestap het.*

# PROGRAMME FOR THE SECOND CEREMONY

## THE FACULTY OF SCIENCE

*To help ensure that the proceedings run their course without disruption, will all those present kindly keep their cell phones switched off, and refrain from leaving the hall, while the ceremony is in progress.*

1. Entrance of academic procession into the hall. You are requested to stand while it enters, and then to remain standing for the singing of the National Anthem.
2. Singing of the National Anthem (see inside back cover). Thereafter, please be seated. Accompaniment: Stellenbosch Symphonic Winds under the baton of Pamela Kierman. Precentor: André Howard.
3. Congregation formally constituted by the Chancellor.
4. Prayer by Dr Natie Philander.
5. Welcome by the Chancellor.
6. Presentation of diploma and degree candidates by the dean of the faculty and conferment of diplomas and degrees by the Chancellor.
7. Closing by the Chancellor.
8. The academic procession leaves the stage.

*Those present are requested to remain standing until the entire academic procession has left the hall.*

# ISICWANGCISO-NKQUBO SOMSITHO WESIBINI

## IFAKHALTHI YOBUNZULULWAZI KWEZOBUGQI

*Ukuqinisekisa ukuba umsitho uqala ngaphandle kwesiphazamiso, bonke abakhoyo bayacelwa ukuba bacime iiselfowuni zabo, kwaye bangaphumi eholweni ngeli xesha umsitho uqhubekayo.*

1. Kungena umkhosi wemithika eholweni. Niyacelwa ukuba nime ngeenyawo xa ungena, nihlale nime njalo ukuze kuculwe uMhobe weSizwe.
2. Kukulwa uMhobe weSizwe (Jonga kumphakathi weqweqwe lokugqibela). Emva koko, ningahlala phantsi. Umculo: yi-Stellenbosch Symphonic Winds ngaphantsi kwentonga yombhexeshi kaPamela Kierman. Umbhexeshi: nguAndré Howard.
3. UMsitho uvulwa ngokusesikweni nguTshansila.
4. Umthandazo wenziwa nguGqr Natie Philander
5. Ulwamkelo lwenziwa nguTshansila.
6. Ukunikezelwa kweediploma nezidanga kubafundi yintloko yefakhalthi (idin) echaphazelekayo nokuthweswa kweediploma nezidanga nguTshansila.
7. Ukuvalwa koMsitho nguTshansila.
8. Umkhosi wemithika uyalishiya iqonga.

*Bonke abakhoyo bayacelwa ukuba beme ngeenyawo de umkhosi wemithika ube uphume wonke eholweni.*

# LYS VAN KANDIDATE WAT KWALIFIKASIES ONTVANG

*Die diplomas en grade van kandidate wat nie by die plegtigheid teenwoordig kan wees nie, sal in hulle afwesigheid toegeken word.*

## **Fakulteit Natuurwetenskappe**

### **BACCALAUREUS IN DIE NATUURWETENSKAPPE (BSc)**

#### **BACHELOR OF SCIENCE (BSc)**

ABRAHAMS, Melissa

ADAMS, Buin

ALDUM, Samantha Jane

AMUKOTO, Tuyambeka Megameno Victoria

ARENDSE, Monique Rameez

ARNOLDS, Jean Dimitri

ATTERBURY, Elizma Maria

BAARD, Rudolf Willem

BARKHUIZEN, Jan Harm Labuschagne

BARNARD, Anje

BAUFELDT, Sven

BENECKE, Rohan Meerholz

BERGH, Alexandra Jane

BERRY, Richard Oliver

BESTER, Natalie Carrol

BEUKES, Ihron Peter

BEUKES, Michella

BEZUIDENHOUT, Salomé Hendrieka

BINNEMAN, Carlene

BLOM, Carina

BOCK, Senadia

BOLDING, Michael Douglas

BOLLAND, Steven

BOTES, Marthinus Gerhardus

BOTHA, Christoffel Jacobus

BOTHA, Ryno

BREDENKAMP, Christiaan Johannes

BRITS, Leanne

BURGER, Alletta Magdalena

BURGER, Robert William

BUZER, Brendan Edward

CARTER, Joelene Kay

CASPER, Rozanne

CASTELL, Dominic Christian

CHALMERS, Curtis Colin

CLAASSEN, Herzelle

CLOETE, Kimberlee Lesa

CLOETE, Wynand

COETZE, Lisa

COLLETT, Anna Grace

CORBETT, Melissa

DAFFUE, Yolande

DE JAGER, Laura-Ellen

DE JONGH, Johannes Justinus

DE KOCK, Marli Christel

DE LA HARPE, Alana

DE LANGE, Danielle Catherine

DE VILLIERS, Dawie

DE VILLIERS, Jana

DE WAAL, Desere

DE WET, Hanneke

DENKHAUS, Erik

DIPPENAAR, Alwyn Bernard

DLAMINI, Sibonginkosi

DRIESCHER, Natasha

DU PLESSIS, Stacey Lee

DU TOIT, Danielle Martine

DU TOIT, Therina

ENGELBRECHT, Amy

ESTERHUIZEN, Arné Jasper

FERNHOUT, Jean-Jacque

FERREIRA, Inge

FIVAZ, Nikkie

FORTUIN, Shannon-Lee

FOURIE, Ryno

GILIOME, Johnel

GOLDSWAIN, Toni Leigh

GOOSEN, Wynand Johan

GOUWS, Lyzlé

GRAHAM, Roxanne

GREEFF, Marli

GROENEWALD, Jadri

GRUNEWALD, Janine

HAGENDIJK, Adrianus Jan

HAMIT, Mogammad Baaghith

HAVENGA, Hendrik Johannes

HAWKEN, Lara Jane

HEUER, Romauld William

HEUNES, Elisma

HEYMANN, Mia

HICKMAN, John-Henry

HILL, Amy

HOOPER, Lauren

HUANG, Lih-Chii Michelle

HUNTER, Thalana

HUTCHINSON, Kyle

JANSEN VAN RENSBURG, Ryan

JANTJIES, Duane

JEWELL, Jonathan Frederick

JOACHIM, Michelle Margaret

JONAS, Melissa Tracey-Lee

JONKER, Rolf

JORDAAN, Bianca

JORDAAN, Liezl

JORDAAN, Pieter Johannes Godfried

JOSEPH, Moegamat Cassiem

JOUBERT, Ninon

KARGAARD, Annette  
 KEBAUTLWILE, Reokeditswe  
 KLAASEN, Eurice  
 KOEGELENERG, Danika  
 KOOPMAN, Nicole  
 KOTZE, Lucinda Wilma  
 KOTZE, Mareli Marguerite  
 KOTZE, Monika  
 KRITZINGER, Charne Charmian  
 KRUGER, Carli  
 KRUGER, Rynhardt Pieter  
 KRUGER, Tolene Mia  
 LABUSCHAGNE, Zanne Claire  
 LAMBERT, Karen  
 LAMBRECHTS, Hugo  
 LANGENHOVEN, Shaun Denver  
 LAUBSCHER, Regina Barbara  
 LEYGONIE, Liandri Wilme  
 LOCHNER, Johan Christiaan  
 LOCKEY, Taryn Louise  
 LOOTS, Johannes Hendrik  
 LUYT, Natasha Alethea  
 MADUNA, Simo Njabulo  
 MAHOMED, Ejaz  
 MAIN, Carin  
 MALEKA, Sechaba  
 MARAIS, Margo  
 MASOABI, Malira Alina  
 MATTHEE, Megan Alvina  
 MAVUNDZA, Nhlalala Yolanda Zoe  
 McDOWELL, Ashleigh Louise  
 McEVOY, Robyn Leigh  
 MENZE, Samora  
 MILLER, Kerry Margaret  
 MITCHELL, Megan Irvette  
 MOLENAAR, Nicholas  
 MORGAN, Horatio Herbert  
 MORRISON, Romano Richleigh  
 MOSKOFF, Jessica Joy  
 MULLER, Claudette  
 MULLER, Leska Tahni  
 MÜLLER, Trevor Neal  
 NAUDE, Anzerie  
 NEL, Alicia  
 NEL, Lerie Rissa  
 NESBITT, Chantel  
 NIEUWOUDT, Sharne  
 NOORDMAN, Leandri  
 NORTIER, Jeanne  
 NTSAPI, Matlakala Claudia  
 OLIVIER, Monica Catherine  
 OOSTHUIZEN, Kenneth Thomas  
 OPPERMAN, Jofred Timothy Marques  
 PAGE, Dian Heinrich  
 PEARCE, Tasneem  
 PEEK, Charles Michael  
 PERKINS, Meghan  
 PETERSEN, Keegan Carl  
 PIENAAR, Milandre Yvonne  
 PRAIN, Neil Patrick Harding  
 PRETORIUS, Jason Craig  
 RALL, Johannes  
 RAUCH, Friedel  
 ROBERTSON, Nedene  
 ROBINSON, Leandi Chaldene  
 ROBINSON, Talita  
 ROOS, Martha Ryna  
 ROSSOUW, Raymond Eugene  
 ROUX, Daniel Alexander  
 ROUX, Jacobus Stephanus Hugo  
 SADLER, Megon Denise  
 SANGER, Monique  
 SANTANA, Monica Manuela  
 SCHEEPERS, Charné Marlene  
 SCHROETER, Carmen Liesel  
 SHAW, Tarryn  
 SHEEN, Harriet Andrea  
 SIMONS, Nigel Royce  
 SLAZUS, Ene  
 SMALBERGER, Anika  
 SMIT, Surita  
 SMIT, Xanthe  
 SMITH, Shane Raymond  
 SMYTH, Natalie Anne  
 SPALTMAN, Monique  
 STELLUTO, Bernardo Nicola  
 STEYN, Lize  
 STEYN, Nicola Karen  
 STRAUSS, Kim Stacey  
 SWANEPOEL, Gustav  
 SWART, Lelani  
 SWART, Thandi  
 TEMMINGH, Elize  
 TERBLANCHE, Elisma  
 TERHART, Shana Lourdes  
 THERON, Marene  
 TROCH, Christoph Nicolas Aime  
 UDJOMBALA, Ndahambelela Ndeshipewa Ndapandula  
 VAN DEN BERG, Magritha Francina  
 VAN DER MERWE, Hendrik Naude  
 VAN DER MERWE, Jeanine  
 VAN DER MERWE, Suzane  
 VAN DER WESTHUYZEN, Alet  
 VAN GREUNEN, Andrea  
 VAN NIEKERK, Liezel  
 VAN REENEN, Richard George  
 VAN RENSBURG, Wilma  
 VAN RHYN, Ashley Shane  
 VAN ROOIJEN, Jacobus Johannes  
 VAN STADEN, Roelien  
 VAN WYK, Jacobus Johannes  
 VAN WYK, Rozanne  
 VAN ZYL, Esteé Alwelien  
 VAN ZYL, Winschau Fayghan  
 VENTER, Dirk Willem  
 VERMEULEN, Andre

VISSER, Christina Gertruida Maria  
VISSER, Hanri  
VISSER, Rita-Marié  
VOS, Liesl  
WALTERS, Nicolas  
WANG, Hsin-Nua  
WEITSZ, Zita  
WHITEHEAD, Kellyn  
WHITFIELD, Michael Gordon  
WIGMORE, Laura Rose  
WOLFF, Magdel

**BACCALAUREUS IN DIE NATUURWETENSKAPPE  
CUM LAUDE (BSc CUM LAUDE)**

**BACHELOR OF SCIENCE CUM LAUDE  
(BSc CUM LAUDE)**

BAILEY, Marc Alister  
BENADE, Johannes Gerhardus  
BRUMMER, Johann Wiggert  
COFFEE, Michelle  
DU TOIT, Erasmus Johannes  
ERASMUS, Antoinette  
FERNANDES, Danielo  
GROBLER, Deborah Ann  
HAGSPIHL, Robert  
JOUBERT, Nereus Adriaan  
KEMP, Jurene Ellen  
LATEGAN, Jodi  
MILNE, Robyn  
MINDA, Iulia  
OVENDEN, Ellen Susan  
ROOS, Alicia  
ROSSOUW, Stephanus Johannes  
STEPHENS, Marina Anne  
TAIT, Timo  
VAN ZYL, Phillippus Johannes

**HONNEURS-BACCALAUREUS IN DIE  
NATUURWETENSKAPPE (HonsBSc)  
BACHELOR OF SCIENCE WITH HONOURS (BScHons)**

ADEYEMO, Adebayo (Geoinformatika)  
AGENBACH, Cornelia (Geologie)  
ANDRIES, Brenden Brian (Toegepaste Wiskunde)  
BAADJIES, Marshall Franscouis (Geologie)  
BELL, Hilgard (Rekenaarwetenskap)  
BEUKES, Dillan Charles (Fisiologiese Wetenskappe)  
BEZUIDENHOUT, Yolande (Geologie)  
BOTH, Pieter Willem (Plantkunde)  
BOTMA, Gerard Christopher (Geologie)  
BOWES, Jenna (Fisiologiese Wetenskappe)  
BRAND, Erhard (Geoinformatika)  
BRAND, Francois Alwyn (Biochemie)  
BRUINTJIES, Sharlene Suenette (Geologie)  
BUQA, Nandipha Millicent (Geologie)  
BURGER, Franco (Geologie)  
BURGER, Nicholas (Fisiologiese Wetenskappe)  
CAPRARO, Martin Horst (Fisika)  
COETZEE, André (Geologie)

COETZEE, Mia (Geologie)  
COLLOP, Natalie Chantel (Biochemie)  
CONRADIE, Johannes David (Biochemie)  
COWIE, Danielle (Genetika)  
CROXFORD, Lara Jane (Plantkunde)  
DE KOCK, Erhardt Rabe (Toegepaste Wiskunde)  
DE LANGE, Stephanie Siobhan (Dierkunde)  
DOBROWSKY, Penelope Heather (Mikrobiologie)  
DOWD, Sue-Jeanne Louise (Mikrobiologie)  
DU PLESSIS, Carel Merwe (Geologie)  
DU PLESSIS, Ihan Lambert (Mikrobiologie)  
ENGELBRECHT, Corne (Geologie)  
ERASMUS, Wade Luke (Fisika)  
FAYEMIWO, Oluwadamilade Martha (Mikrobiologie)  
FISHER, Nadia Mitilda (Genetika)  
FISHER, Tarryn-Lee (Biochemie)  
GARSON, Kirsty-Lee (Fisiologiese Wetenskappe)  
GAVA, Lucia Adelina (Fisiologiese Wetenskappe)  
GEIGER, Armin Guntram (Wynbiotegnologie)  
GILDENHUYS, Enelge (Dierkunde)  
GOVENDER, Yogeshni (Fisiologiese Wetenskappe)  
HANEKOM, Crischelle (Fisika)  
HANEKOM, Thea (Biochemie)  
HARMZEN, Erika (Polimeerwetenskap)  
HENDRICKS, Lauren Nathalie (Mikrobiologie)  
HIGGINS, Faatiemah (Genetika)  
HILL, Megan (Geologie)  
HODSON, Luke Eric (Chemie)  
HOOP, Lynn Prudence (Chemie)  
HUGO, Daniël Pieter (Geologie)  
HUGO, Kemp Henkie (Geologie)  
JACOBS, Leandrie (Wynbiotegnologie)  
JOUBERT, Caitlyn Amy (Dierkunde)  
JOUBERT, Pierre (Toegepaste Wiskunde)  
KANG, Sharon (Biochemie)  
KILIAN, Johann Georg (Geologie)  
KUBIRSKA, Tanja (Geologie)  
KUHN, Stefan (Biochemie)  
LE GRANGE, Jan-Christian (Geologie)  
LIEBENBERG, Elizabeth Cornelia (Mikrobiologie)  
LIU, Wing Pui Amy (Dierkunde)  
LOUW, Elizabeth Adrienne (Fisiologiese Wetenskappe)  
LOUW, Marli (Mikrobiologie)  
MAKWELA, Seatlane Lerato (Geologie)  
MARAIS, Charl (Plantbiotegnologie)  
MATEURA, Milcent (Chemie)  
MBIZANA, Siyasanga (Polimeerwetenskap)  
MBWANJLI, Kenneth Charles (Genetika)  
McLEAN, Christopher Robert (Geologie)  
MEALOR, Kelly Ann (Dierkunde)  
MLISWA, Vuyo Kaizer (Polimeerwetenskap)  
MORGENROTH, Olaf (Wynbiotegnologie)  
MORRISSEY, Kathryn Lee (Biochemie)  
MOTSI, Margaret (Polimeerwetenskap)  
MOUTON, Marili (Mikrobiologie)  
MTHEBULE, Sagwati Bridgeth (Geologie)  
MUDAU, Rotondwa (Fisika)  
MUGARI, Mufaro Buhlebenkosi (Biochemie)

MUKHUWANA, Onica (Plantkunde)  
 MUKUMBI, Annakleta (Geologie)  
 MULLER, Anche (Plantkunde)  
 MÜLLER, Ronel (Chemie)  
 MULLER, Sybrand Jacobus (Geoinformatika)  
 NDLOVU, Easter (Biochemie)  
 NEVELING, Deon (Mikrobiologie)  
 NGAZA, Nyashadzashé (Polimeerwetenskap)  
 NGONYI, Rachel Munany'e (Fisiologiese Wetenskappe)  
 OLIVIER, Liesl Bronwyn (Polimeerwetenskap)  
 OLIVIER, Nicola (Fisiologiese Wetenskappe)  
 PAUW, Marina (Mikrobiologie)  
 PIETERS, Jacques (Geologie)  
 PLOKHOOY, Oliver Simon (Plantkunde)  
 SCHARLACH, Kerstin (Polimeerwetenskap)  
 SCHMIDT, Leandri (Genetika)  
 SITTMANN, Margarete (Genetika)  
 SMUTS, Hanna-Mari (Chemie)  
 SPRINGFIELD, Lezaan Sevonne (Genetika)  
 SYMINGTON, Burger (Fisiologiese Wetenskappe)  
 THEART, André Christiaan (Wynbiotegnologie)  
 THERON, Louwrens Wiid (Wynbiotegnologie)  
 THUYNSMA, Rochelle (Plantbiotegnologie)  
 TSHOTSHO, Anele (Plantkunde)  
 TSOTSA, Sizwe Stephen (Polimeerwetenskap)  
 TURNER, Cameron Clive (Geologie)  
 UAZEUA, Kakunauua (Geologie)  
 VAN DER COLFF, Dewidine (Plantkunde)  
 VAN DER WALT, Michael (Fisiologiese Wetenskappe)  
 VAN NIEKERK, Christopher Steven (Biochemie)  
 VAN TONDER, Talita (Polimeerwetenskap)  
 VERMAAK, Marshelle (Genetika)  
 VERMEULEN, Divan (Geoinformatika)  
 VICTOR, Gustav Mauritz (Genetika)  
 VIRÉT, Angélique (Chemie)  
 WIESE, Anna Johanna (Plantbiotegnologie)  
 WIESE, Tobias Johannes (Plantkunde)  
 ZWIEGERS, Alicia (Geologie)

**HONNEURS-BACCALAUREUS IN DIE  
 NATUURWETENSKAPPE CUM LAUDE  
 (HonsBSc CUM LAUDE)  
 BACHELOR OF SCIENCE WITH HONOURS CUM LAUDE  
 (BScHons CUM LAUDE)**

ADAMS, Adrian Richard (Geologie)  
 ANDREWS, Craig Joseph (Biochemie)  
 BARNARD, Leanne (Biochemie)  
 BEZUIDENHOUT, Ilse-Marie (Wynbiotegnologie)  
 BOUMA, Jake Timothy (Fisika)  
 BUYS, Jan Moolman (Rekenaarwetenskap)  
 CALLAGHAN, Kerry Lee  
 COOMER, Megan Anne (Genetika)  
 HAYWARD, Stefan (Biochemie)  
 HEYSTEK, Anina (Plantkunde)  
 HUBER, Thomas (Biochemie)  
 JANSE VAN RENSBURG, Marinel (Wiskunde)  
 KIMENE KAYA, Boniface Dimitri Christel (Fisika)  
 KLOPPER, Sunette Laurika (Biochemie)

MEIRING, Maynard (Wiskunde)  
 MORTIMER, Morne (Biochemie)  
 OOSTHUIZEN, Joubert (Wiskunde)  
 RUDNICK, Tarryn-Kim (Geologie)  
 SMIT, Corneli (Genetika)  
 STEYN, Mark Andrew (Sielkunde)  
 VAN DER WESTHUIZEN, Leandi (Chemie)  
 VAN HEERDEN, Dewald Pepler (Chemie)  
 VAN ROOYEN, Renier (Wiskundige Statistiek)  
 VAN ZYL, John Henry de Villiers (Mikrobiologie)  
 VON FLOTOW, Andrea Berenike (Fisika)

**MAGISTER IN DIE NATUURWETENSKAPPE (MSc)  
 MASTER OF SCIENCE (MSc)**

BOTHA, Marlie (Mikrobiologie)  
 CHAKUPA, Tendai (Geografie en Omgewingsstudie B)  
 CLOETE, William Joseph (Polimeerwetenskap)  
 COETZEE, Bronwyne Jo'sean (Sielkunde)  
 CONRADIE, Tobie Tertius (Plantbiotegnologie)  
 CREUS, Pieter Koenraad (Geologie)  
 CROUS, Christiaan (Biochemie)  
 ELS, Zelda (GIS: Omgewingsgeografie)  
 GRABOWSKY, Monika Elvira (Polimeerwetenskap)  
 JANA, Collins Edward (Biochemie)  
 JORDAAN, Sandra (Biochemie)  
 KHALEEL, Esra Ahmed Mohammed Adam (Fisika)  
 KHESWA, Bonginkosi Vincent (Fisika)  
 MBAKWE, Chidinma (Wiskunde)  
 McLACHLAN, Ann (Dierkunde)  
 NJOKWENI, Anathi Perseverance (Mikrobiologie)  
 OCHIGBO, Josephine Elanma (Wiskunde)  
 OMARI, Mohamed (Wiskunde)  
 PADAYACHEE, Devea Levi (Kliniese Sielkunde en  
 Gemeenskapsvoorligting)  
 PRINGLE, Carla (Polimeerwetenskap)  
 SONIBARE, Wasiu Adedayo (Geologie)  
 VESTNER, Jochen (Chemie)  
 WINKLER, Dietrich Maximilian Albert (Wiskunde)

**MAGISTER IN DIE NATUURWETENSKAPPE  
 CUM LAUDE (MSc CUM LAUDE)  
 MASTER OF SCIENCE CUM LAUDE (MSc CUM LAUDE)**

BAMUNOBA, Alex Samuel (Wiskunde)  
 BARKHUYSEN, Shani (Chemie)  
 BASSON, Gysbert (Toegepaste Wiskunde)  
 BESTER, Inneke (Wynbiotegnologie)  
 BEZUIDENHOUT, Charl Xavier (Chemie)  
 BOTHA, Leendert Willem (Rekenaarwetenskap)  
 EL MOUSTAID, Fadoua (Wiskunde)  
 ENEYEW, Eyaya Birara (Toegepaste Wiskunde)  
 GEYER, Jani (Fisika)  
 HAYWARD, Peter John (Rekenaarwetenskap)  
 KARSTEN, Minette (Dierkunde)  
 KOTZE, Danelle (Plantkunde)  
 MICHAEL, Friday Ifeanyi (Wiskunde)  
 MINOARIVÉLO, Henintsoa Onivola (Rekenaarwetenskap)  
 MOLLER, Karl (Fisika)  
 MSISKA, Mwawi Fred (Rekenaarwetenskap)

NJAGARAH, Hatson John Boscoh (Wiskunde)  
ONANA ELOUNDOU, Jeanne Marie (Wiskunde)  
READER, Paul William (Polimeerwetenskap)  
REYNOLDS, Terry Veronica (Dierkunde)  
RUSCH, Ursina Denise (Dierkunde)  
SCHLÜNZ, Evert Barend (Operasionele Navorsing)  
VAN WYK, Mia (Dierkunde)  
VAN ZYL, Hendrik Jacobus Rust (Fisika)  
WRIGHT, Trevor (Polimeerwetenskap)

## DOKTORSGRADE DOCTORATES

### Fakulteit Natuurwetenskappe

#### PhD

BADENHORST, Daleen (Zoology)

*Rattini (Rodentia, Murinae) species relationships and involvement as reservoirs for scrub typhus: a comparative molecular cytogenetic and gene expression approach*

A comparative molecular cytogenetic investigation of Rattini identified a constrained pattern of chromosome evolution in these rodents. This study presents the first hypothesis of the Rattini ancestral karyotype that may prove useful in directing the selection of species for future large-scale investigations of rodent genome organisation. A qPCR approach designed to examine the role of Rattini species as reservoirs of scrub typhus (infectious febrile disease) identified a link between the underexpression of syndecan-4 in Murini and seropositive Rattini rodents that may explain the poor carrier status of Murini, and increased longevity of Rattini host species.

Supervisor: Prof TJ Robinson  
Co-supervisor: Dr G Dobigny

BAYLEY, Gareth Michael (Polymer Science)

*Novel electrospun fibres of amphiphilic organic-inorganic graft copolymers of poly(acrylonitrile)-graft-poly(dimethylsiloxane) for silicone composite reinforcement*

The inclusion of nanoscale fillers in polymer materials has the potential to dramatically modify the physical and mechanical properties of these materials. A new amphiphilic graft copolymer of acrylonitrile and poly(dimethylsiloxane) was developed for use as a novel filler for silicone elastomer. This unique material was designed to provide mechanical strength from the acrylonitrile segments while simultaneously being compatible with the silicone matrix. The material also allows for the inclusion of carbon nanotubes in the silicone matrix. The material was processed into nanofibres, using the electrospinning technique. The amphiphilic nature of the material leads to highly porous fibre morphology due to the self-assembly of the polymer in the electrospinning solution. The inclusion of this material in a silicone matrix leads to a dramatic increase in the strain at break (elongation) in silicone elastomers.

Supervisor: Prof PE Mallon

BOONZAAIER, Leandro (Physics)

*Confined counterions surrounding a macroion – a field-theoretic approach*

A field-theoretic approach was developed to study Coulomb interactions of confined counterions with a charged spherical macroion of variable radius. The linearised field theory shows bound states in the spectrum under all conditions which lead to non-perturbative effects. The fluctuation part of the free energy favours a decrease in the free energy upon expansion of the macroion inside the fixed confinement volume and it also does not dominate the free energy at high, but finite, temperatures. A novel regularisation scheme for computing the relevant functional determinant was introduced and the associated cut-off could be specified unambiguously in terms of physical parameters.

Supervisor: Prof KK Müller-Nedebock  
Co-supervisor: Prof FG Scholtz

CLOETE, Valeska (Polymer Science)

*Impact of molecular structure on water vapour sorption properties in nanostructured polymeric films*

Three aspects related to the transport behaviour of water vapour in polymeric films were investigated: the effects of reactive surfactants, clay-based organophilic modifiers and polymer crystallinity. The inclusion of reactive surfactants resulted in the rapid diffusion of water vapour through latex films. Low permeability associated with increased diffusion path tortuosity for water vapour could be eliminated by the increased solubility associated with the presence of intercalated clays. Polymer chain mobility could reduce diffusion kinetics to a greater extent than crystalline domains in polymer films. These findings could be used in the engineering of protective coatings with controlled water vapour sorption behaviour, for the packaging materials industry, in particular where specific transport behaviour of water vapour is required.

Supervisor: Prof H Pasch  
Co-supervisor: Dr P Hartman

ELHRARI, Wael Khalifa Salem (Polymer Science)

*Synthesis and characterisation of multiphase copolymers*

Graft copolymers were synthesised, using a combination of various living polymerisation techniques and boron chemistry. Multifunctional polymer backbones were synthesised and then functionalised, using boron chemistry to form multifunctional macroinitiators. These were subsequently used in 'grafting from' polymerisation reactions. Two advanced analytical techniques were used to examine the phase morphology of the graft copolymers: solid state nuclear magnetic resonance and positron annihilation lifetime spectroscopy. Complementary information on the compositional phase segregation point of the graft copolymers was obtained. Analysis of the spin diffusion from the nuclear magnetic resonance data enabled the interpretation of the seemingly anomalous results in the positron data observed at the phase segregation point.

Supervisor: Prof PE Mallon

GREESH, Naji Giuma (Polymer Science)

*Preparation of polymer-clay nanocomposites by dispersion polymerisation using tailor-made polymeric surface modifiers*

Clays are a good example of naturally occurring precursors of nanomaterials. When delaminated, 2:1 smectite clays separate into 1-nm thick layers, which, when incorporated into polymer materials, im-

prove the mechanical properties, thermal stability and gas barrier properties. A new method of preparation of polymer-clay nanocomposites, involving dispersion polymerisation, was developed. The incompatibility between the inorganic clay and the organic polymer matrix was overcome by using various clay organic modifiers. Inter-calated to semi-exfoliated materials with enhanced latex stability and coating properties were obtained. This approach has possible direct application in the coatings industry.

Supervisor: Dr P Hartmann

Co-supervisor: Prof RD Sanderson

HEIDT Alexander Matthias (Physics)

*Novel coherent supercontinuum light sources based on all-normal dispersion fibres*

The highly topical issue of supercontinuum generation, which finds wide application in diverse research fields and technology applications, is addressed in this research. The focus is on utilising new developments in photonic crystal fibres to produce highly coherent ultra-broadband spectral output with reduced pump source requirements compared to traditional zero dispersion wavelength fibre setups. New photonic crystal fibres were designed to operate in the normal dispersion regime, in order to maintain excellent temporal coherence. A broadband supercontinuum with temporal coherence which allowed for pulse compression to a few cycle ultrashort pulse was produced for the first time.

Supervisor: Prof EG Rohwer

Co-supervisor: Prof H Bartelt

HERBERT, Simon Anthony (Chemistry)

*Oxazoline directed lithiation of calix[4]arene and ferrocene*

This research pioneered the first synthetic method to inherently chiral calix[4]arenes, which, although theoretically known for over three decades, have only now been permitted in targeted asymmetric synthesis. It opens the door to further investigation into new catalyst motifs that may have a significant role to play in the fine chemical arena. This research also demonstrated that the chiral oxazoline directing group could be tuned to deliver either diastereomer of the product, thus extending the versatility of the method. This unusual effect was also demonstrated on ferrocene systems, confirming its wider applicability to other chiral systems.

Supervisor: Dr GE Arnott

KALEME, Prince Kiswele Kabulu (Zoology)

*Habitat fragmentation, patterns of diversity and phylogeography of several small mammal species in the Albertine Rift*

The genus *Praomys* was used as a model to investigate different hypotheses underlying the patterns of diversification for small mammals in the Albertine Rift. Molecular and morphological characters were combined to unravel systematic and phylogeographic relationships, and placed the divergence of the *Praomys* group in the Pliocene. It is speculated that past climate cycling, habitat fragmentation as well as species-specific ecological requirements were causal in the patterns of diversification. The results contribute to our understanding of the biogeography of the Albertine Rift as well as the mechanisms underlying species distribution and diversification.

Supervisor: Prof B Jansen van Vuuren

Co-supervisors: Profs RCK Bowie, J Bates

KOEKEMOER, Lizbé (Chemistry)

*Characterisation of prokaryotic pantothenate kinase enzymes and the development of type-specific inhibitors*

Pantothenate kinase (PanK) enzymes catalyse the first reaction in the five-step biosynthesis of the essential cofactor coenzyme A. Importantly, PanKs exhibit a unique diversity between different organisms, therefore highlighting it as a potential drug target. In this study the type III PanK of specifically pathogenic bacteria were characterised with the goal of developing type-specific inhibitors. Several questions about the activity of the *Mycobacterium tuberculosis* enzyme were answered. The first inhibitors that are competitive to the pantothenate binding site were designed, synthesised and tested against the *Pseudomonas aeruginosa* enzyme. This resulted in the discovery of the most potent inhibitors of this PanK type to date.

Supervisor: Prof E Strauss

LOKUGALAPPATTI, Sampath (Zoology)

*Climatic perturbation and speciation of Southern and East African Bulbul/Greenbul species (family Pycnonotidae)*

African greenbuls are an ideal model system to explore different hypotheses that may underlie observed patterns of lineage diversification. Phylogenetic and population genetic methods to reconstruct the diversification history of three African greenbul species/species complexes (*Pycnonotidae*) in Southern and East Africa were used. Most of the greenbul diversification took place in the Plio-Pleistocene and the primary mechanism appears to be climatic cycling, yet dispersal and vicariance have also shaped the population genetic structure. The pattern of diversification observed in the three study taxa/species complexes differs substantially and can mostly be explained by the Pleistocene refuge hypothesis.

Supervisor: Prof B Jansen van Vuuren

Co-supervisors: Profs RCK Bowie, J Fjeldså

OMBINDA LEMBOUMBA, Saturnin (Physics)

*Femtosecond pump probe spectroscopy of light harvesting complexes and phthalocyanines*

The development and application of a time resolved spectroscopic technique for analysis of ultrafast photo-induced processes on the timescale of hundreds of femtoseconds to hundreds of picoseconds are reported. This pump probe spectroscopy setup was fully characterised and applied to study natural photosynthetic complexes as well as an artificial complex, Zn phthalocyanine, used in photodynamic cancer therapy. The study of photosynthetic complexes is motivated by the need for artificial light harvesting complexes for solar cells. The new results on Zn phthalocyanine add to the understanding of the ultrafast dynamics of this drug in cancer therapy.

Supervisor: Dr A du Plessis

Co-supervisors: Dr CM Steenkamp, prof EG Rohwer

VAN DER WESTHUIZEN, Katriena Elizabeth (Chemistry)

*Comprehensive multidimensional GC for the analysis of Fischer-Tropsch products*

The analysis of Fischer-Tropsch-derived synthetic crude and derived products is very challenging because of the highly complex nature of these products. Comprehensive multidimensional gas chromatography (GCxGC) was found to be invaluable for the analysis of these complex

mixtures. GCxGC was used in combination with micro-reactor experiments to simulate the Sasol Secunda plant operation to assist with the development of accurate engineering models and was instrumental in Sasol obtaining international approval for use of their fully synthetic jet fuel as Jet A1 fuel.

*Supervisor:* Prof P Sandra

*Co-supervisor:* Dr AJ de Villiers

## **MEDALJES** (Ter kennisname)

## **MEDALS** (For your information)

### *Natuurwetenskappe*

John Todd Morrison-medalje:

Mnr K Möller

Meiring Naudé-medalje:

Mnr JT Bouma