GRADUATION CEREMONY

Faculty of Science

SARAH BAARTMAN HALL

4 September 2024

FACULTY OF SCIENCE

ORDER OF PROCEEDINGS

Academic Procession.

(The congregation is requested to stand as the procession enters the hall)

The Presiding Officer will constitute the congregation.

The National Anthem.

Welcome by the Master of Ceremonies.

Musical Item.

The graduands will be presented to the Presiding Officer by the Dean of the faculty.

The Presiding Officer will congratulate the new graduates.

The Master of Ceremonies will make closing announcements and invite the congregation to stand.

The Presiding Officer will dissolve the congregation.

The procession, including the new graduates, will leave the hall.

(The congregation is requested to remain standing until the procession has left the hall.)

NATIONAL ANTHEM

Nkosi sikelel' iAfrika
Maluphakanyisw' uphondolwayo,
Yizwa imithandazo yethu,
Nkosi sikelela, thina lusapho lwayo.

Morena boloka etjhaba sa heso,
O fedise dintwa la 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.

NAMES OF GRADUANDS

FACULTY OF SCIENCE

Dean: Professor H Suleman

DEGREE OF BACHELOR OF SCIENCE

Alexander, Jarryd Thomas
Ally, Ahmed Zaakir
Babbage, Gavin
Berens, Peter Daniel
Bezuidenhout, Keeran
Bonne, Marie Amaryllis
Brayshaw, Chloe
Budullah, Muhammad Yousouf Ali
Celliers, Gabriella Maria
Charumbira, Marian Rugare
Chauque, Tebogo
Clayton, Luke Robin
D'Andrea, Nina Raven Joy
Danisa, Anele Lloyd
Dlamini, Siyabonga
Dlomo, Njabulo Annacletia
Dotwana, Asisipho
Dowlut, Bibi Oomay Shahiirah
Elion, Gregory Stephen
Geldenhuys, Chloë Sophia
Gunasekara, Senarath G V D Yelanika
Havenga, Nazreen
Hlalele, Boitumelo Tumi
Homwe, Wayne Rufaro
Ismail, Kauthar
Jadezweni, Sesethu
Jiao, Xuanjie
Johane, Junior Raymond T
Khumalo, Ntokozo (with distinction in Psychology)
Kopping, Dean Jordan
Kuhudzai, Mazano Kundiso (with distinction in Computer Engineering and Computer Science and the degree with distinction)
Langeveld, Natalie Alyssia
Maholobela, Matimba Phenuel
Makanda, Oyama
Makhomu, Vusani Vincent
Makiki, Nondumiso Patricia
Maluleke, Khanimambo Jamela
Manatsa, Zanorashe
Manqele, Moses Celimpilo
Manyike, Nfanelo
Maseva, Takudzwa Sherpherd
Mata, Danile
Mathebula, Sanele
Mathlore, Tshepang
Mathoto, Matshepo Etia
Mdluli, Njabulo Rivaldo
Miehe, Nicolas Michael Senekal
Mmakola, Mokgaetsi Happiness
Mohamed, Uwais
Morum, Belen Starr
Msomi, Anele
Mtombeni, Bangiwe Nothukela Anthia
Mtshakazi, Kundai
Mukadam, Abraar Ahmed
Mulidzi, Mulweli
Myerson, Lance Ari
Myeza, Mbali Asathi Emma
Naidoo, Shivaskar Yatinraj
Ndlovu, Mduduzi Ntokozo
Ngomane, Bongi Innocentia
Ngubane, Samukelo
Nikwe, Ngabelwa
Ntsele, Akhona
Ntsieni, Rilinde
Ntwanambi, Aluta
Nxangashe, Yanga
Nxasane, Andile Olwethu
Nxumalo, Sandile
Obrien, Keegan
Padiachy, Prashanth
Poken, Nivan
Qoshe, Mangaliso Michael
Ramotlou, Neo Errol
Rosewitz, Callan Joanne Louise
Rutherford, Jack Nicholas Dicey
Sadiki, Mamodike Tryiphosa
Schnell, Frances Jennifer
Seameco, Bokamoso Angel
Senyatsi, Mokgethoa Phuti
Shabangu, Bongani Success
Sihlangu, Refiloe Evodia
Singo, Idani Agrineth
Skosana, Vusi Prince
Swanepoel, Emma
Swartz, Ridge David
Tasdhary, Dylan
Teffo, Katlego Austin
Themba, Tinnious Lesedi
Timamputu, Vuaya Joel
Tjabadi, Makamele
Tyholo, Funeka Fortunate
Venter, Nicholas Owen
Volker, Jed
Waker, Ryan Matthew
Wilson, Ethan Maxwell
Xaba, Nonjabulo Noluthando
Yawa, Simphiwe
Zondi, Kholofelo Tshegofatso

DEGREE OF BACHELOR OF SCIENCE HONOURS

Burgers, Frederik Leon
Crook-Mansour, Justine Lara (in the first class)
Kovarsky, Aaron Barry
Lin, Zhengyu
Maluleke, Ntshobelo Blessing (in the first class)
Mazoko, Mbali Concelation
Mwanawina, Sanana
Ndebele, Khethukuthula Sandiso
Sangweni, Nkosinathi Thobani (in the first class)
Shezi, Enock Oswell
Sikani, Membathisi
Stead, Peter Anthony (in the first class)

DEGREE OF MASTER OF PHILOSOPHY

Asary, Gavin
Chakanetsa, Hope Tarisai
De Lange, Jacques Emile (with distinction in the coursework component)
Fraser, Sally Jean Alice (with distinction in the coursework component)
Konz, Jade Carey
Monaheng, Koaile Reitumetse
Mosienyane, Keamogetse (with distinction in the coursework component)
Mshelia, Saratu Musa (with distinction in the coursework component)
Seakgwa, Kyle Vuyani (with distinction in the dissertation)
Theron, Elzarie (with distinction in the dissertation)
Tredoux, Aimée Sarah (with distinction in the coursework component)
Van Eeden, Dona Adine (with distinction in the coursework component)

DEGREE OF MASTER OF SCIENCE

Adams, Tevin Mitch
Adebowale, Adetola Quddus (with distinction)
Adelola, Temitope Rebecca
Akkas, Tugce (with distinction)
Allouchery, Zoe
Arlow, Henco
Aslan, Bilal Hasan
Ayinla, Oluwaseun Ayodeji
Baluku, Erikan (with distinction)
Bambiso, Lungelo Tervin

Bauer, Dominic Günther (with distinction)
Beckenstrater, Gordon John
Bloemetje, Jenna
Boakes, Jamie Edward Russell (with distinction in the coursework component)
Campbell, Abigail Mackenzie (with distinction in the coursework component)
Campos Liebetrau, Diana Rangel Lopes de
Catzel, Rachel
Charters, Daniel John (with distinction)
Coetzee, Carla
Collins, Sean Michael
Cope, Sky (with distinction in the coursework component)
Davids, Mymoena (with distinction)
Davids, Tara Kelly (with distinction)
de Kock, Leandri (with distinction)
de Villiers, Mikhail Ashley
De Vos, Casha
Diretse, Reikantseone
Du Plessis, Jean-Jacq André (with distinction)
Edwards, Amy Rene (with distinction)
Fee, Gareth Nicholas
Frösler, Hannah Maggie (with distinction)
Grimbly, St John
Hoosen, Naadiya (with distinction in the coursework component)
Horn, Inca Juliet (with distinction in the coursework component)
Iitumba, Ndinelao Mundolo (with distinction)
Impson, Blair Nicholas
Jojo, Bongiwe Nokuthula Patience
Keren Gil, Boaz (with distinction in the coursework component)
Kgomo, Teballo Madumetja
Leisegang, Nicholas
Lekomola, Senate Pearl
Leukes, Chad Jarryd (with distinction in the coursework component)
Lindsay, Sarah Catherine (with distinction)
Maphugwi, Mulalo
Matlhoko, Khumo
Mabaso, Xolani
Mfana, Siwaphiwe (with distinction)
Morch, Casper (with distinction in the coursework component)
Mugova, Amos
Narayan, Saiheal Dhramraj
Ncetani, Sinethemba
Netshongolwe, Felicity Tapiwa Tshifhiwa
Oosthuizen, Andries Cornelius
Pillay, Vineshree (with distinction in the coursework component)
Price, Penelope Anne
Rajak, Ehsaan Mahomed (with distinction)
Ramudzuli, Abigail
Robertson, Caroline Frances (with distinction)
Searle, Lauren Jane (with distinction in the coursework component)
Singh, Pavan (with distinction in the coursework component)
Solomons, Kyle Stefan (with distinction in the dissertation)
Späth, Josef Carter
Steyn, Lawrence Edward (with distinction in the coursework component)
Talbot, Deborah Jane (with distinction in the coursework component)
Tembo, Masharty
Theron, Dylan Grant (with distinction)
Toefy, Mohammed Fay-Yaad (with distinction)
Tsewu, Sandile Derick
Tshaka, Liso (with distinction)
Van Blerk, Joshua Paul (with distinction)
Van Der Merwe, Robert Steven (with distinction)
Veltman, Alexander Gio (with distinction)
Visagie, Marizanne
Walker, Kyle Sandy (with distinction)
Williams, Kelly Ann (with distinction)
Yapi, Sizwekazi (with distinction in the dissertation)

DEGREE OF DOCTOR OF PHILOSOPHY

Balekaki, Gerald Nathan
Thesis Title: *A scalable database model of RFI data for the MeerKAT/SKA radio telescope*

Gerald Balekaki completed his Bachelor of Statistics and MSc in Data Communication and Software Engineering at Makerere University in Uganda. He began full-time study towards his PhD in 2016.

Gerald Balekaki's thesis presents a scalable database model that stores and quickly retrieves radio frequency interference (RFI) data to enable scientists to identify and remove undesired signals from the radio astronomical signals at the largest and most sensitive radio telescope in the world, the Square Kilometre Array (SKA). His work addresses a storage challenge in the RFI mitigation pipeline at the SKA:- he employs a new database model (a polystore) to develop a design for scalable RFI database that enables integrated storage of RFI data of different formats. This work is an important step in enhancing the quality of radio observations at the SKA by addressing the problem of radio interference.

Supervisor: Professor M Kuttel (Computer Science)
Co-supervisor: Associate Professor S Blyth (Astronomy)

Beckering Vinckers, Ulrich Karoo
Thesis Title: *Classical, quantum and numerical aspects of modified theories of gravity*

Ulrich Karoo Beckering Vinckers completed his BSc, BSc (Hons) and MSc degrees at UCT and began his full time PhD studies in the Cosmology and Gravity Group in 2021.

Ulrich Karoo Beckering Vinckers' thesis focuses on specific aspects of three modified theories of gravity. Firstly, the quantum gravitational entanglement of two test masses in the context of linearised non-local gravity is examined. The relevant gravitational potential is derived and it is shown that the concurrence and von Neumann entropy for a specific set-up decreases when increasing the non-locality length scale. Secondly, non-local modifications of two two-dimensional dilaton gravity models are constructed and it is demonstrated that the linearised solutions of such theories are free of the singular nature of their local counterparts. Finally, a numerical relativity code is constructed and implemented to study the evolution of a massless scalar field in a dynamical space-time described by paradigmatic classes of f(R) scalar-tensor theories which are modifications of General Relativity.

Supervisor: Dr Á de la Cruz-Dombriz (Mathematics)

Co-supervisors: Professor A Mazumdar (University of Groningen, Physics), A/Professor D Pollney (Rhodes University, Mathematics)

Cloete, Cleavon Kader
Thesis Title: *In vitro metabolism studies to inform the physiologically-based pharmacokinetic modelling of mefloquine, ritonavir and proguanil*

Cleavon Cloete completed his BSc at Stellenbosch University. He went on to obtain BSc (Hons) and MMedSc qualifications at UCT before commencing full-time study towards his PhD in 2020.

Cleavon Cloete's thesis focusses on modelling drug metabolism data for selected drugs used in the treatment of malaria and HIV/AIDS. During this work, he uncovered the involvement of previously unreported enzymes in the metabolism of the studied drugs. These data were then used to develop physiologically based pharmacokinetic models. Simulations performed using these models were used to demonstrate how variability in the metabolism of these drugs can lead to differences in their effectiveness and/or toxicity. These findings are useful in the design of new drugs, as well as in the design of clinical studies to improve the treatment outcomes of patients.

Supervisor: Dr M Njoroge (Chemistry)
Co-supervisor: Professor K Chibale (Chemistry)

Coetzee, Vivienne Nicole
Thesis Title: *Morphological, ethological and genomic discrimination of functional stocks of spotted grunter, an estuarine-dependent fish*

Vivienne Coetzee completed her BSc (Hons) in the Department of Biological Sciences at UCT in 2017. She began an MSc in 2018, which was subsequently upgraded to a PhD at the end of 2019.

Vivienne Coetzee's thesis investigates two stocks of spotted grunter, *Pomadasys commersonnii,* from two biogeographically distant and environmentally distinct estuaries. Despite best efforts by a virus named "Corona" and a horse named "Cajiva", she succeeds in using morphological and ethological techniques to reveal differences in spot patterns, otolith shapes, and the characteristic "grunting" sounds of spotted grunter between the two estuaries. She links these differences, related to visual and acoustic modes of communication, with differences in water turbidity. Furthermore, she explores whether these differences are shaping genomic divergence. Her findings suggest that local adaptation is occurring, with the development of slight genomic differences, hinting towards early stages of population divergence through the establishment of a local breeding population of spotted grunter in the Breede Estuary. Unexpectedly, her findings show that, under experimental conditions, spotted grunter calls are louder in the less turbid estuary, which might be linked to anthropogenic noise levels.

Supervisor: Honorary A/Professor S Kerwath (Biological Sciences)
Co-supervisors: Dr D Parker (Biological Sciences), Dr S Lamberth

Cottrant, Emy Yvonne
Thesis Title: *Assessing conservation measures for five southern African endemic shark species*

Emy Cottrant completed her BSc and MSc qualifications at the University of Aix-Marseille, in France. She began studying towards her PhD at UCT in 2021.

Emy Cottrant's thesis uses mark-recapture, acoustic telemetry and baited remote underwater videos to gain knowledge on five southern African endemic shark species (Dark shyshark *Haploblepharus pictus*, puffadder shyshark *Haploblepharus edwardsii*, leopard catshark *Poroderma pantherinum*, pyjama shark *Poroderma africanum* and spotted gully shark *Triakis megalopterus*). She describes distribution range of catsharks within Walker Bay, Hermanus, along with differences in growth rate between captive and wild pyjama sharks. She then uses acoustic telemetry to investigate movement pattern of spotted gully sharks *Triakis megalopterus* in the Western Cape, highlighting potential key areas for the conservation of the species. Finally, she uses baited remote underwater videos as a theoretical approach to assess the accuracy of metrics currently recorded during video analysis to assess relationship between species such as predator-prey interactions. Overall, her findings give insights on the efficiency both of current protection measures for each species and of South Africa's marine protected areas.

Supervisor: Emeritus Professor L Underhill (Biological Sciences)

Craig, Christie Anne
Thesis Title: *Conservation in a changing world: assessing the conservation status of an agriculturally adapted species, the blue crane*

Christie Anne Craig completed her Bachelors and Honours Degrees at Rhodes University, and obtained her Masters in Conservation Biology at UCT. She has been working for a conservation NGO, the Endangered Wildlife Trust, since beginning her PhD research in 2019.

Christie Craig's thesis examines the conservation status of Blue Cranes in South Africa, with particular focus on the Western Cape wheatlands. Over the last 20-30 years the Blue Crane population has recovered from past decreases, but the key population in the Overberg has declined by roughly one-fifth over the last 10 years, likely due to poor breeding productivity and recruitment. This thesis highlights powerline collisions as a significant threat, developing a predictive model which will inform future powerline placement. Using satellite-linked tags, Christie Craig developed movement metrics and survival estimates for Blue Cranes in the Western Cape. Analysis of crane movements and survival shows differences between breeding and non-breeding cranes. Recommendations include listing the species as Vulnerable on the IUCN Red List, emphasizing the potential ecological trap in the Western Cape wheatlands. The study underscores the challenges of conservation in man-made ecosystems, emphasizing the need for interdisciplinary approaches.

Supervisor: Emeritus Professor P Ryan (Biological Sciences)

De Doncker, Stephen George
Thesis Title: *Heteroleptic dirhodium(II,II) complexes: synthesis, spectroscopy and applications in hydroformylation and hydroaminomethylation catalytic reactions*

Stephen de Doncker completed his BSc, BSc (Hons) and MSc qualifications at UCT and began full-time study towards his PhD in 2020.

Stephen de Doncker's thesis reports the synthesis and development of bimetallic dirhodium complexes as catalyst precursors for hydroformylation and hydroaminomethylation reactions. He went on to investigate key aspects, such as the physicochemical properties of the complexes, their redox behaviour, the hemi-lability of the counter ion and the effects of these factors on the catalytic activity and recyclability of the catalysts in the hydroformylation reaction. The complexes were then investigated for application in the hydroaminomethylation reaction, by optimisation of the reaction conditions and nature of the catalyst. A variety of substrates were explored for both catalytic reactions, and the resulting catalyst system was identified as a candidate for the efficient synthesis of two analogues of a known opioid analgesic compound. These findings may be useful for enhancing the efficiency and extending the scope of pharmaceutically relevant compounds.

Supervisor: Dr S Ngubane (Chemistry)
Co-supervisor: Professor G Smith (Chemistry)

Delport, Janais
Thesis Title: *The botanical and mineral characterization and authenticity of honeys from the Greater Cape Floristic region*

Janaïs Delport holds a BSc (Hons) in Entomology, which she completed at Rhodes University in 2019. In 2020, she joined UCT as a Masters student, upgrading to a PhD thesis in 2021.

Janaïs Delport's thesis enriches our understanding of our local honeys, exploring the principle of benchmark development to enhance the South African industry's ability to distinguish authentic honey products. Here, she studied the pollen trapped in honey to identify the plants bees collect nectar from and used these plant profiles to reconstruct the vegetation types that surround the hives the honey was harvested from. She used the pollen to assign appropriate labels to the honeys, with denominations including *Erica*, *Protea*, and Fynbos honey as examples. From the pollen, mineral and sugar content, she described new, local honey benchmarks which can be used to distinguish locally produced honeys from those produced in other provinces and even other countries. The outcome of her research serves to protect the local honey industry against the ever-growing threat of food adulteration and fraud, ensuring that locally produced honey gets the recognition it deserves.]

Supervisor: Professor M Muasya (Biological Sciences)
Co-supervisors: Dr S Manzano (Universidad de León) and Dr C Edmonds-Smith (Chemistry)

De Vos, Sebastiaan Colin
Thesis Title: *The feasibility of a commercial-scale recirculating aquaculture system integrating sea urchins (Tripneustes gratilla) and seaweed (Ulva)*

Sebastiaan "Bas" Colin de Vos completed his BSc and BSc (Hons) qualifications in Marine Biology at UCT and began an MSc in 2019, which was upgraded to a PhD in 2021. He has been set on working in aquaculture since high school.

Sebastiaan de Vos conducted a thesis to determine the feasibility of a commercial land-based recirculating Integrated Multi-Trophic Aquaculture (IMTA) system using sea urchins *(Tripneustes gratilla)* and macroalgae *(Ulva).* Extensive production optimisation trials found that shallow baskets (around 15cm deep) with a stocking density of 20% coverage were ideal for *T. gratilla*. A computer vision program was also developed for the precise and efficient measurement of large quantities of sea urchins. A farm-scale model of an urchin-Ulva IMTA system was formed largely based on data derived from a water chemistry analysis of *T. gratilla* effluent and using a configuration from existing abalone-Ulva IMTA farms. It reveals this system would not be viable based on existing abalone-Ulva systems due to limitations in bioavailable nitrogen for *Ulva* production. However, there are opportunities for resolving this issue. The study revealed *T. gratilla* production could be high, indicating potential for further pursuit of this industry.

Supervisor: Emeritus Professor J Bolton (Biological Sciences)
Co-supervisor: Dr B Macey (Department of Agriculture, Forestry and Fisheries)

De Wet, Simon Nicholas
Thesis Title: *Gamma-ray bursts with MeerLICHT*

Simon de Wet completed his undergraduate and honours degrees at UCT and graduated with a master's degree in the Department of Astronomy in 2020. He began full-time study towards is PhD shortly thereafter.

Simon de Wet's thesis focusses on the study of the most luminous and relativistic explosions in the Universe, known as gamma-ray bursts. Making use of a robotic optical telescope located in Sutherland called MeerLICHT, he led a 2.5 year-long observing campaign to catch the afterglow light from these explosions in real time. Over the course of the campaign, 26 bursts were followed-up by MeerLICHT, with three being sufficiently interesting to require detailed studies of their own. This entailed obtaining data from across the electromagnetic spectrum, including radio waves, optical light, X-rays, and gamma-rays, and interpreting these data within models of synchrotron radiation produced in relativistic explosions. A key finding from these studies is that established afterglow models may need to be revised to better-accommodate observations.

Supervisor: Professor P Groot (Astronomy)

Dobah, Farhaan
Thesis Title: *Methodology investigations for the synthesis of biologically important nitrogen-containing heterocycles*

Farhaan Dobah completed his BSc and BSc (Hons) in Chemistry at UCT, where he began his research full-time in Organic Synthesis thereafter.

Farhaan Dobah's thesis describes environmentally benign methods geared towards the development of novel molecules extracted from natural sources for the treatment of diseases central to Africa. His thesis also explores the themes of radical chemistry and the exciting world of light-mediated chemistry and their utility in the world of Organic chemistry.

Supervisor: Dr W Petersen (Chemistry)

Engelbrecht, Tamlyn May
Thesis Title: *The spatial ecology and behaviour of the broadnose sevengill shark (Notorynchus cepedianus) in South Africa*

Tamlyn Engelbrecht completed her BSc and BSc (Hons) qualifications at UCT and then upgraded her Masters dissertation to a PhD in 2017. While completing her thesis, she worked as research manager for the NGO Shark Spotters in Cape Town.

Tamlyn Englebrecht's thesis explored the broad and fine scale movement patterns and behaviour of the broadnose sevengill shark *(N. cepedianus)* along the coastline of southern Africa. She used both tag-recapture data from the Oceanographic Research Institute and acoustic tag data recorded on the ATAP acoustic receiver array to explore dispersal, residency, site fidelity and long-range migrations of broadnose sevengill sharks along the South African coastline. During the course of her research two killer whales began predating on her study animals, providing a unique opportunity to explore how a top predator responds to increased presence and predation pressure from the world's apex marine predator.

Supervisor: Professor J O'Riain (iCWild, Biological Sciences)
Co-supervisor: Dr A Kock (SANParks, SAIAB)

Etwarysing, Lekraj
Thesis Title: *Feed attractants in aquaculture - the chemical composition of aquacultured Ulva lacinulata (Chlorophyta)*

Lekraj Etwarysing holds a BSc (Hons) from the University of Mauritius and an MSc (Biological Sciences) from UCT. He began study towards his PhD in 2015 and while at UCT was the secretary-treasurer of the Phycological Society of Southern Africa.

Lekraj Etwarysing's PhD thesis takes a multidisciplinary approach comprising behavioural biology and analytical chemistry techniques to investigate extracts and identify compounds from the green seaweed *Ulva lacinulata* that have feed stimulant properties towards the sea urchin *Tripneustes gratilla*. He first prepared a crude extract of this seaweed that he divided into different extracts. Lekraj Etwarysing then tested these different extracts on the sea urchin in chemosensory trials. His research showed that the sea urchins were attracted and showed feed preference to two specific extracts. He used a combination of nuclear magnetic resonance (NMR) spectroscopy and liquid chromatography–mass spectrometry (LC–MS) to identify the compounds present in those two extracts and identified six complex lipids that can be feed stimulants for this sea urchin. With the worldwide expansion of sea urchin aquaculture, his findings can be of great importance during the formulation of aquafeed for sea urchins.

Supervisor: Emeritus Professor J Bolton (Biological Sciences)
Co-supervisors: Professor D Beukes (University of the Western Cape, School of Pharmacy) and Dr B Macey (Biological Sciences)

Hepworth, Ehlke
Thesis Title: *Synoptic weather systems over Antarctic sea ice: understanding the link between extratropical cyclones and extreme variability in Antarctic sea-ice concentration*

Ehlke Hepworth completed her BSc in 2015 at UCT, followed by her Honour's and Master's degrees at UCT in Physical Oceanography, then began her PhD in 2019. From Honours though to PhD, she has been focussed on Antarctic sea-ice dynamics.

Antarctic sea ice is not a solid lid over the ocean, but rather an ever-changing mosaic of ice, water, and air. Ehlke Hepworth's thesis focuses on extreme weather systems over the Antarctic sea-ice environment. In particular, she analysed the impact of polar cyclones on the sea-ice cover, and how extreme changes of atmospheric temperature and moisture are linked to cyclones and other events, such as atmospheric rivers. Her analysis found that up to 50% of the extreme changes in the sea-ice cover are associated with storms. Extreme temperatures on sea ice are more likely due to cyclones, while extreme moisture is associated to atmospheric rivers. These results sheds new light on the relationship between atmospheric features over the sea-ice environment. As the atmosphere continues to change with global warming, her results serve as a foundation for further investigations into how the Antarctic sea-ice environment may respond.

Supervisor: Professor M Vichi (Oceanography)

Knopp, Jasmin Fay Camilla
Thesis Title: *Functional divergence of the RNA polymerase II transcription machinery in Plasmodium falciparum*

Jasmin Knopp completed her BSc and BSc (Hons) qualifications at UCT before beginning her PhD studies in the Department of Molecular and Cell Biology.

Jasmin Knopp's thesis describes the functional characterisation of three *Plasmodium falciparum* RNA polymerase II general transcription factors: the TATA binding protein (TBP) and TBP-Like protein (TLP), and transcription factor IIB (TFIIB). Her work examines protein-DNA interactions and protein-protein interactions, as well as assembly of these transcription factors into phase-separated protein condensates. Her work provides insight into the molecular mechanisms underlying gene

regulation at the level of transcription in *P. falciparum* and reveals the existence of *Plasmodium*-specific features that provide promising new targets to guide the development of novel anti-malarial drugs.

Supervisor: Dr T Oelgeschläger (Molecular & Cell Biology)

Low, Marcus Otto
Thesis Title: *A complex, high-performance agent-based model used to explore tuberculosis and COVID-19 case-finding interventions*

Marcus Low completed his MA and MPhil qualifications at UCT and US and started studying towards his PhD in 2020. He edits the public health magazine Spotlight and previously headed the Treatment Action Campaign's policy, communications, and research department.

Marcus Low's thesis describes the development of a complex agent-based model with substantial social structure and coded in C++. He uses the model to explore the impact of several early case-finding interventions on tuberculosis (TB) and COVID-19 infections and deaths. His work suggests that annual testing of people considered to be at high risk of TB is more effective than mass X-ray screening and that the impact of the two interventions are additive. His modelling also suggests that the impact of TB testing will be dramatically increased if testing can be conducted more frequently than every four months and that the impact of contact tracing programmes for COVID-19 is highly sensitive to test turnaround times.

Supervisor: Professor M Kuttel (Department of Computer Science)
Co-supervisor: Dr N Geffen (Centre for Social Science Research)

Maenzanise, Precious
Thesis Title: *Early human social transmission during Marine Isotope Stage 5: a perspective from the Kalahari Basin*

Precious Maenzanise holds BA (Hons) and MA degrees in Archaeology from the University of Zimbabwe. She joined the Archaeology Department at UCT in 2021 for her PhD studies. Before joining UCT, she worked as a Junior Lecturer at the University of Zimbabwe.

Precious Maenzanise's thesis focuses on how past technological systems are organised and maintained in relation to macroclimatic and environmental conditions. She studied stone artefact attributes to explore cultural information exchange between groups inhabiting the Kalahari Basin and environs during Marine Isotope Stage 5, spanning ~130 000 to 74 000 years ago, which saw the development and proliferation of uniquely human behaviours. She inferred, using a behavioural approach to cultural transmission, that similarities in the typological and technological characteristics of stone artefacts from different sites in the studied region suggest information exchange between spatially distant early human groups. She found that the evidenced technological information exchange to be unusually high for an interglacial period. She attributes this pattern of social interaction and cultural transmission in and around the Kalahari Basin to the less pronounced changes in the macroclimate and subsistence environment relative to coastal and other inland areas in southern Africa.

Supervisor: Dr Y Sahle (Archaeology)
Co-supervisor: Dr J Wilkins (Griffith University, Archaeology)

Medupe, Thato Tshwaro
Thesis Title: *Synthesis, characterization, and anticancer activity of arene mono-ruthenium and heteroleptic mixed-valent diruthenium complexes*

Thato Tshwaro Medupe holds BSc, BSc (Hons), and MSc degrees in Chemistry from North-West University, Mafikeng. He joined the Department of Chemistry at UCT and embarked on his PhD in 2017.

Thato Medupe's research focuses on the development and investigation of the anticancer properties of ruthenium-based metallodrugs. He executes this by designing a synthetic methodology to prepare and isolate these compounds. In collaboration with the Department of Human Biology, he further investigates the antineoplastic activity of these compounds against human breast adenocarcinoma subtypes. Guided by his findings on the mechanisms of cell death induced by the metallodrug treatments, his work enables him to propose the necessary structural and electronic properties for compounds with impact and selectively towards inhibiting the growth and proliferation of cancerous cells over normal epithelial cells. Altogether, his thesis addresses the "Good Health and Well-being" sustainable development goal by substantiating the potential use of ruthenium coordination compounds in cancer therapy, which continues to remain a vital approach in the discovery of potent metallodrugs.

Supervisor: Dr S Ngubane (Chemistry)
Co-supervisor: Professor S Prince (Human Biology)

Mobara, Ayesha
Thesis Title: *Application of a multi-method approach to the stock identification and discrimination of kingklip, Genypterus capensis (Smith, 1847), off the South African coast*

Ayesha Mobara completed her MSc at the University of the Free State. She joined UCT as an NRF-intern based at the Animal Demography Unit in 2014. In 2015, she enrolled as a student and began full-time study towards her PhD.

Ayesha Mobara's study focuses on the stock structure of South African kingklip. This marine fish is endemic to South Africa and is of substantial economic significance. She uses a multi-method approach to assess whether the two genomically-differentiated stocks off South Africa are phenotypically differentiated. The methods used include morphology, meristics, otolith shape analysis, otolith microchemistry,

and the use of parasites as biotags. Her results indicate a weak spatial structure for mature fish, and a moderate spatial structure for immature fish. These results are coherent with the bentho-pelagic life cycle characteristic of the species. This research will be useful in the future managements of this commercially important fish.

Supervisor: Emeritus Professor L Underhill (Biological Sciences)
Co-supervisors: Dr C Reed (Biological Sciences), Dr C van der Lingen (Department of Agriculture, Forestry and Fisheries and Biological Sciences)

Moola, Naadirah Ismail
Thesis Title: *6-deoxy-6-amino chitosan: A plant defence priming biopolymer that enhances resistance against Botrytis cinerea in tomato and Fusarium verticillioides in maize*

Naadirah Moola completed her Biochemistry and Genetics BSc and BSc (Hons) degrees at UCT. Her Molecular and Cell Biology MSc at UCT was upgraded to a PhD in 2018 and her PhD was a joint degree between UCT and the University of Gent in Belgium.

Naadirah Moola's thesis focused on investigating a water-soluble biopolymer, 6-deoxy-6-amino chitosan (aminochitosan), as a preventative treatment to *Botrytis cinerea* infection in tomato and *Fusarium verticillioides* infection in maize. To pinpoint temporal, physical, and molecular changes associated with aminochitosan's priming and antifungal effects, Naadirah Moola utilized non-invasive multispectral imaging, staining, microscopy, temporal label-free quantitative proteomics analysis, and targeted gene expression and metabolomic analyses. Her findings showcased aminochitosan's dual efficacy, demonstrating direct antifungal effects in vitro and in vivo. Additionally, it primed the plant's immune system economically, resulting in stronger, more rapid, and sustained defense responses when challenged subsequently. This priming is facilitated through sustained photosynthetic parameters, epigenetic regulation, and inhibition of reactive oxygen species. The thesis highlights the value of sustainable and environmentally friendly fungicides.

Supervisor: Associate Professor S Rafudeen (Molecular and Cell Biology)
Co-supervisors: Associate Professor A Jardine (Chemistry) and Professor K Audenaert (Ghent University, Plants and Crops)

Mormile, Joselyn Elise
Thesis Title: *An interdisciplinary study on the human-baboon interface in Rooiels, South Africa*

Joselyn Mormile completed her BS in Animal Behavior from Rutgers University (USA), her MSc in Primate Conservation from Oxford Brookes (UK) and began her PhD in 2016.

Joselyn Mormile's thesis focuses on the human-baboon interface in an urban community that has opted to share space with baboons. She uses interdisciplinary methods, including GPS tracking, behavioural observations and community questionnaires, to understand the urban overlap from both human and baboon perspectives. The troop has a small home range and shows a strong selection for the urban area, which they visit routinely. Baboon access to human-derived foods was low, however, due to high resident vigilance and baboon-proofing. Residents show high acceptance for troop visits, which is linked to their wildlife value orientation, attitude and emotions towards baboons. Despite their acceptance, the troop's mortality rate was high and mostly attributed to indirect anthropogenic causes, including vehicles and dogs. Joselyn Mormile's thesis cautions against encouraging wildlife to share urban spaces and highlights the importance of assessing the causes and consequences of urban human-wildlife overlap through an interdisciplinary lens.

Supervisor: Professor J O'Riain (Biological Sciences)

Motsoaledi, Mokhine Pheladi
Thesis Title: *Accretion processes in cataclysmic variable stars: insights from optical transient surveys*

Mokhine Motsoaledi completed her BSc at the University of the Witwatersrand. She continued her studies, from BSc (Hons) through to PhD, at the Department of Astronomy at UCT, with an affiliation to the South African Astronomical Observatory.

Mokhine Motsoaledi's thesis is a study of mass-transferring binary stars called cataclysmic variable stars, specifically the magnetic cataclysmic variables and the ultra-compact helium-transferring cataclysmic variables. She collected over 400 hours of observations with the optical 1 metre, 1.9 metre telescopes and the 10-metre world-class Southern African Large Telescope at the South African Astronomical Observatory in Sutherland to uncover the nature of her sample of cataclysmic variables. She developed a quantitative process to identify and characterise the magnetic cataclysmic variables using their long-term changes in optical brightness. This approach may lend itself to be developed into machine learning techniques, allowing for the identification of many new magnetic cataclysmic variables through large-scale all-sky surveys.

Supervisor: Professor P Woudt (Astronomy)
Co-supervisor: Dr D Buckley (Astronomy)

Nashed, Abdullateef
Thesis Title: *Development of coupled enzyme assay and in vitro synthetic biology approach for glycosylation pathway characterization*

Abdullateef Nashed completed a BSc in Biochemistry at Aleppo University in Syria. Following this he studied for and graduated with a Master degree in Biochemistry from the National University in Malaysia. He joined the Scientific Computing Research Unit's (SCRU) Glycobiomedical laboratory in 2020 as a doctoral student in Experimental Chemical Biology.

Abdullateef Nashed's doctoral

research produced novel analysis tools to study the mechanism and kinetics of glycosyltransferases. These are a group of 200 enzymes that function differentially in many diseases, such as cancer (or cancer therapy targets). A further development of his was an enzymatic synthesis system capable of studying complex multistep the glycosylation processes in vitro. Together, these innovative tools open the way to a systems approach in glycobiology. He demonstrated this on an important case study resolving the unknown mechanism of action between two important enzymes glycosylating the oncoprotein Mucin 1. This work lays down the foundation to significantly advance our molecular understanding of complex diseases such as the cancer.

Supervisor: Professor K Naidoo (Chemistry)

Oddy, Meghan Jessica
Thesis Title: *New explorations in visible-light mediated energy and single electron transfer for nitrogen heterocycle synthesis*

Meghan J. Oddy completed both her BSc, majoring in Chemistry and Physics (2018), and her BSc (Hons) in Chemistry at UCT (2019), and began full-time studies towards her PhD in 2020.

Meghan Oddy's PhD thesis reports the development of low-cost, sustainable chemical synthesis methods for the creation of therapeutically relevant biomolecules, such as quinolinones and beta-lactams, the latter critical to the fight against antibiotic resistance. Taking inspiration from photosynthesis, the biological process of converting light into chemical energy, she demonstrated that visible-light from a standard LED light could drive powerful chemical transformations and ultimately construct diverse libraries of biomolecules. This is significant as industrial processes typically require high reaction temperatures, but Meghan Oddy's work was conducted at room temperature, thus consuming significantly less energy. This work makes significant strides toward enhancing chemical sustainability and reducing the environmental impact and cost of chemical industries and drug manufacture.

Supervisor: Dr W Petersen (Chemistry)

Pattinson, Nicholas Bruce
Thesis Title: *Effects of temperature and food availability on the reproductive ecology of an arid-zone bird*

Nicholas Pattinson attained his BSc Zoology Honours with distinction at the University of Pretoria and his MSc Zoology cum laude at Nelson Mandela University before starting his PhD Biological Sciences full-time at UCT.

Nicholas Pattinson's thesis investigates the effects of environmental temperature and food resources on the breeding ecology of Southern Yellow-billed Hornbills *Tockus leucomelas*, in the Kalahari Desert. The thesis assesses the results of a supplementary feeding experiment on behaviour, morphology, physiology, and breeding success of the birds. Air and nest temperature affect traits such as nestling growth and stress hormone production, and nestling and adult thermoregulation, but food availability and/or quality strongly influence these effects, and directly affect reproductive outcomes. Nicholas Pattinson attributes his findings primarily to the impact of resource availability and quality on behavioural and developmental trade-offs as predicted by life history theory. He also shows that drought and high environmental temperatures are associated with long-term breeding failure in this species, with rapid climate warming set to cause local extinctions within three decades. His findings contribute to understanding the reproductive ecology of arid-zone birds and their vulnerability to climate change.

Supervisor: A/Professor S Cunningham (Biological Sciences)
Co-supervisor: Professor A McKechnie (University of Pretoria, Zoology and Entomology)

Rajohnson, Sambatriniaina Hagiriche Aycha
Thesis Title: *Exploring the evolution and hidden large-scale structures of galaxies with MeerKAT HI surveys*

Sambatriniaina Rajohnson completed a BSc in Physics (2016) and a MSc in Physics with a major in Astrophysics (2018), both with distinctions, from the University of Antananarivo in Madagascar. At the end of 2018 she joined UCT to follow her dream in pursuing a PhD in observational extragalactic astronomy.

Sambatriniaina Rajohnson's thesis focuses on three blind systematic neutral hydrogen (HI) surveys carried out with the MeerKAT radio telescope. She explores how galaxy scaling relations change with redshift by studying the relationship between HI masses and galaxy HI disk sizes over a billion years of cosmic time. She finds that this relationship remains stable over this interval in time. She then uses two other MeerKAT surveys to uncover galaxies hidden behind the Milky Way with the intent to reveal the extent and morphology of a dynamically important massive supercluster in the Vela constellation. In this heavily obscured region, she uncovers 1562 galaxies through their emission of neutral gas, most of which had never been observed before. By mapping their positions in three dimensions, she identifies various previously unknown structures, including clear signatures of two hypothesized wall-like overdensities that form part of the supercluster.

Supervisor: Emeritus Professor R Kraan-Korteweg (Astronomy)
Co-supervisor: Dr B Frank (United Kingdom, Science and Technology Facilities Council)

Sparks, Shannon-Leigh
Thesis Title: *Investigating the role of the circadian clock transcription factor, TOC1 in the defence response against Botrytis cinerea in Arabidopsis thaliana*

Shannon-Leigh Sparks completed her BSc and BSc (Hons) qualifications at UCT and began full-time study towards her PhD in 2017.

Shannon-Leigh Sparks' thesis

describes the role played by a core circadian clock transcription factor, TOC1, in the regulation of immunity in *Arabidopsis thaliana*. Using a reverse genetics approach, she shows that TOC1 is a negative regulator of immunity against the necrotrophic pathogen *Botrytis cinerea*. Through transcriptome profiling, she identifies defence-related transcription factors that are potential targets of TOC1, and then uses chromatin immunoprecipitation to show that TOC1 occupies the promoters of several of these genes in uninfected plants. TOC1 binding represses target gene expression and is attenuated upon infection of the host plant. Finally, by generating transgenic plant lines that express a TOC1 fusion protein in the absence of MYC2, a key defence-related transcription factor, she demonstrates that MYC2 modulates TOC1 binding to target gene promoters and may be required for TOC1 release following pathogen challenge. These findings provide a mechanistic link between the circadian clock and immunity.

Supervisor: Associate Professor R Ingle (Molecular and Cell Biology)
Co-supervisor: Associate Professor L Roden (Coventry University, School of Life Sciences)

Sunnassee Taukoor, Sheveenah
Thesis Title: *A modelling study of Port Alfred upwelling at the inshore edge of Agulhas Current*

Sheveenah holds a BSc in Archaeology and Environmental Science, a BSc(Hons) in GIS, and an MSc in Physical Oceanography from UCT. She then started a co-badged PhD at UCT and Université de Bretagne Occidentale (France). Meanwhile, she lectured oceanography modules at UCT and Rhodes University and participated in 8 expeditions on South African research vessels.

The focus for Sheveenah Taukoor's thesis was the Port Alfred upwelling, situated on the southeast African shelf and its influence by the Agulhas Current, cyclonic eddies, coastal trapped waves and the wind. She examined the upwelling cell's atmospheric and oceanographic drivers using daily model simulations from 1993 to 2014. Coastal upwelling indices identify 56 events via sea surface temperature residuals and 47 through vertical velocity decomposition. Sheveenah Taukoor's analysis reveals northeasterlies drive summer upwelling through offshore Ekman transport, while winter's southwesterlies induce mixing. The Agulhas Current primarily drives upwelling in this region, yet cyclonic eddies and coastal trapped waves influence some events. Combined analyses from daily simulations of the CROCO model as well as observational (WOA18, CARS09, OSTIA) highlight surface divergence as a dominant driver, emphasizing the need for continued research to support potential marine conservation efforts. This is a joint degree between the Universities of Cape Town and De Bretagne Occidentale (UBO) in France.

Supervisor: Professor I Ansorge (Oceanography)
Co-supervisor: Dr P Penven (Institute of Research for Development | IRD · Laboratoire d'Oceanographie Physique et Spatiale)

Timol, Zaheer
Thesis Title: *Modelling and validation of bacterial O-antigen conformations: ring puckering in Shigella flexneri 7a and 7b O-antigens as a case study*

Zaheer Timol holds BSc (Hons) and MSc qualifications from UCT. He enrolled for PhD studies in the computational analysis of bacterial carbohydrates.

Zaheer Timol's thesis investigates immunologically important carbohydrate molecules found on the surface of *Shigella* bacteria to aid the development of future vaccines. Shigella is a leading cause of shigellosis, a diarrheal disease with high incidence and mortality rates in the developing world. His thesis demonstrates, through modelling and experiment, that the molecular structure of immunogenic carbohydrates in a specific strain of the *Shigella flexneri* bacterium (serotype 7) are unexpectedly different from those of related serotypes. Further simulations on smaller representative molecules demonstrate that the widely-used computer models exaggerate certain molecular behavior leading to inaccurate results. His findings highlight the need for corrections to the computer models and also furthers our understanding of bacterial carbohydrates, which may be useful in the development of vaccines against shigellosis.

Supervisor: Professor M Kuttel (Computer Science)
Co-supervisor: Associate Professor N Ravenscroft (Chemistry)

Van Der Merwe, Stephni
Thesis Title: *Investigating ecological drivers and impacts of vegetation change in sub-Antarctic tundra*

Stephni van der Merwe completed her BSc and BSc (Hons) in Environmental Sciences, and MSc in Plant Sciences at the University of Pretoria, all with distinction. She began full-time study toward her PhD in 2019.

Stephni van der Merwe's thesis aimed to identify the underlying drivers of vegetation changes in the sub-Antarctic and to evaluate potential ecological consequences. She first explored classification of Marion Island's vegetation, and concluded that vegetation of such species-poor environments cannot be classed into discrete assemblages. Rather than community responses, the species respond individualistically to environmental change. Using repeat photography, she quantified vegetation changes between 1965 and 2020 and attributed changes to a combination of climate change and invasive species. In order to construct individual species distribution models, she first produced a machine-learning interpolation of soil characteristics and then modelled species distributions to predict how these have and may continue to change into the future. She concluded that "generalist" plant species have increased their ranges significantly, while "specialist" species remained relatively stable. The rapidly changing climate at Marion Island and the impacts of invasive species were identified as the key drivers of these changes.

Supervisor: Professor M Cramer (Biological Sciences)
Co-supervisors: Professor M Greve (University of Pretoria, Plant and Soil Sciences), Professor T Hoffman (Biological Sciences) and Dr A Skowno (Biodiversity Research Assessment and Monitoring, SANBI)

Van Schalkwyk, Lynette
Thesis Title: *Drylines over the interior of subtropical southern Africa*

Lynette van Schalkwyk completed her BSc (2003) and BSc (Hons) (2004) in Meteorology at the University of Pretoria, followed by a MSc degree in 2011. She enrolled at UCT for her PhD in 2020.

Lynette van Schalkwyk's thesis firstly develops a climatology of drylines over the interior plateau of subtropical southern Africa. These are near-surface air mass boundaries separating moist air from very dry air which are often regions of low-level convergence in flow, and which may act to trigger convection, and potentially severe storms. The thesis finds that these phenomena occur most often in spring and summer, almost daily in December. Their frequency of occurrence in particular summers is influenced by ENSO, particularly for drylines on the eastern plateau. Drylines in this region are negatively correlated with frequencies of occurrence in the western plateau. Further investigation of the western drylines shows that about three-quarters of all drylines here are associated with convection. The convective drylines are found to be associated with substantial moisture inflow over the region from the Indian Ocean through the Limpopo and Zambezi River Valleys together with a stronger than average Kalahari heat low. Analysis of a particular month (December 2021) with an anomalously high number of convective drylines over the western plateau highlighted the importance of these features for the record rainfall experienced over central South Africa that summer, as well as the almost daily development of thunderstorms over the region.

Supervisor: Professor C Reason (Oceanography)
Co-supervisor: Dr R Blamey (Oceanography)

Waka, Olwethu
Thesis Title: *On the topological entropy of nilpotent groups of finite rank*

Olwethu Waka holds a BSc in Mathematics from Rhodes University and joined the Department of Mathematics and Applied Mathematics of the University of Cape Town in 2019, where he obtained an MSc with distinction in 2021. He then began his PhD studies in 2022 as a natural continuation of his previous research in the theory of abelian groups.

Waka's PhD thesis deals with the topological entropy in topological groups. Originally, this concept was formulated for dynamical systems, so has its origin in mathematical physics, but soon it was clear that the topological entropy was appropriate to detect symmetries and abstract properties of general geometric structures. Waka's PhD thesis focuses on finiteness conditions for the topological entropy of topological abelian groups and topological Heisenberg groups. In particular, his results represent the first computations of the topological entropy for large classes of topological nonabelian groups.

Supervisor: Dr F Russo (Mathematics and Applied Mathematics)

Welsh, Athi
Thesis Title: *The development of group VIII trinuclear transition metal complexes as chemotherapeutic and photodynamic therapy agents*

Athi Welsh completed his BSc, BSc (Hons) and MSc qualifications at UCT and began pursuing his PhD in 2020.

Athi Welsh's thesis focuses on the development of group eight trinuclear transition metal complexes based on the benzimidazole scaffold as different modalities for the treatment of cancer. He investigated the synthesis of novel metal complexes containing either the iron or ruthenium metal centers, and their suitability for use as potential chemotherapeutic and photodynamic therapy agents. Through a multifaceted approach and in-depth biological evaluations, his study has resulted in the identification of a novel photosensitiser for photodynamic therapy, showing more efficacy than some clinically used photodynamic therapy agents. Additionally, he has identified a lead complex that shows anticancer activity that is more potent than clinically used metallodrugs in rhabdomyosarcomas. These findings will be pivotal in developing an understanding and broadening the application of multinuclear complexes in the treatment of cancer.

Supervisor: Professor G Smith (Chemistry)
Co-supervisor: Professor S Prince (Human Biology)

Womack, Ashleigh Catherine Stevenson
Thesis Title: *An investigation of wind- and wave-driven dynamics in Antarctic sea ice from multiple types of buoy arrays*

Ashleigh Womack completed her BSc, BSc (Hons) and Masters qualifications at UCT, and began full-time study towards her PhD in 2021.

Ashleigh Womack's thesis examined the dynamic nature of the Antarctic Sea ice and its response to extra-tropical cyclones and to waves propagating into the ice cover, using ice-tethered drifting buoys and ship observations. Her thesis revealed the wind's dominant control on ice drift, with additional influences by inertial oscillations and underlying ocean currents. She further investigated how wave-ice interactions affect the ice growth and retreat seasons, impacting the ice cover's susceptibility to drift and deformation. The findings challenge the adequacy of the concentration-based definition of the marginal ice zone, highlighting its complex, evolving nature. The study underscores how the Antarctic ice cover's variability is affected by external forcing and local ice conditions, and thus its drift and deformation can be seasonally and regionally dissimilar. Overall, the thesis contributes to the understanding of Antarctic Sea ice dynamics but stresses the need for more frequent comprehensive direct observational data.

Supervisor: Professor M Vichi (Oceanography)

Zvobgo, Luckson
Thesis Title: *The role of indigenous and local knowledge on climate adaptation for smallholder farmers in Chiredzi, Zimbabwe*

Luckson Zvobgo holds an MSc from the University of Oxford. He started his PhD in 2019. In 2020, he became a Chapter Scientist and Contributing Author of the Intergovernmental Panel on Climate Change's 6th Assessment Report, becoming one of the few UCT researchers to contribute to this global climate change assessment. Luckson Zvobgo's thesis investigates the role of Indigenous knowledge (IK) and local knowledge (LK) in climate adaptation for smallholder farmers in Chiredzi, Zimbabwe. This study demonstrates how IK and LK reduce the vulnerability of smallholder farmers to climate impacts and support the implementation of adaptation. The study further shows how IK and LK weather and seasonal climate forecasts are important for climate decision-making, which increases farmers' preparedness for climate risk through assessment of the reliability of IK and LK forecasts and the effectiveness of the implemented adaptation responses. This body of work contributes to the knowledge on effective IK and LK adaptation responses. Situating these empirical findings within policy and political processes, this study elaborates on how IK and LK can contribute to the Global Goal on adaptation, extending the general understanding of the fundamental role of IK and LK in addressing climate change risks in the 21st century.

Supervisor: Dr P Johnston (Environmental and Geographical Science)
Co-Supervisors: Dr C Trisos (African Climate & Development Initiative) and Dr N Simpson (African Climate & Development Initiative)

VISION AND MISSION
UNIVERSITY OF CAPE TOWN

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SOUTH AFRICA
Lu Nteya: lu.nteya@uct.ac.za
Cindy De Oliveira: cindy.deoliveira@uct.ac.za
Nomcebo Msweli: nomcebo.msweli@uct.ac.za

NORTH AMERICA
USA - East Coast - Porcha Dodson: porcha.dodson@uct.ac.za
West Coast - Megan O'Neill: megan.oneill@uct.ac.za
CANADA - Samantha Mandigora: info@uctcanada.ca

UNITED KINGDOM
Angela Edwards: uct-trust@tecres.net

EUROPE
Andrew Wigley: andrew.wigley@uct.ac.za

AUSTRALIA
Ruth Thornton: rjthornton1@bigpond.com

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