UNIVERSITY OF CAPE TOWN
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UNIVERSITY OF CAPE TOWN

RESEARCH & INNOVATION HIGHLIGHTS 2020-2021

CONTENTS

RESEARCH
GUIDED BY SUSTAINABLE DEVELOPMENT GOALS

Throughout this publication you will see the icons below, referring to the 17 **United Nations Sustainable Development Goals** (SDGs).

UCT is committed to finding solutions to complex problems to help build a sustainable global future. As a result, a great deal of our research is closely aligned to the SDGs, and we continue to make a significant impact towards achieving those goals, as can be seen by the SDG-tagged content of this publication.

UCT believes it is critical that all leading research institutions advance these goals, particularly those on the African continent, which is deeply affected by many of the challenges the SDGs aim to meet.

Find out more about UCT and the SDGs at our dedicated site **here**.

No poverty

Zero hunger

Good health and well-being

Quality education

Gender equality

Clean water and sanitation

Affordable and clean energy

Decent work and economic growth

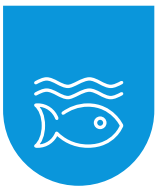
Industry, innovation and infrastructure

Reduced inequalities

Sustainable cities and communities

Responsible consumption and production

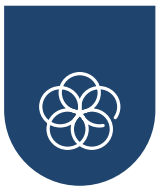
Climate action



Life below water

Life on land

Peace, justice and strong institutions



Partnerships for the goals

SUSTAINABLE DEVELOPMENT GOALS

2020-21 IN NUMBERS
A RESEARCH DASHBOARD

WORLD UNIVERSITY RANKINGS

1st IN AFRICA

UCT is first in Africa, holding the following places in world rankings

183rd IN THE WORLD	109th IN THE WORLD	226th IN THE WORLD	269th IN THE WORLD	201-300 IN THE WORLD
THE 2022	US NEWS 2022	QS 2022	CWUR 2021-2022	ARWU 2021

EMERGING ECONOMIES

UCT holds 16th position in the Emerging Economies University Rankings of the THE 2022

SUBJECT RANKINGS

TOP 10
Development studies
10th IN THE WORLD
QS 2021

TOP 20
Infectious diseases
13th
US NEWS 2022

TOP 50
Public, environmental and occupational health
39th IN THE WORLD
US NEWS 2022

TOP 75
- Mining and mineral engineering
- Public health

GRAS 2021

TOP 50
Immunology
47th IN THE WORLD
US NEWS 2022

Oceanography
48th IN THE WORLD
GRAS 2021

TOP 100
Clinical and health
98th IN THE WORLD
THE 2022

Clinical medicine
GRAS 2021

TOP 50
Environmental Science and Engineering
23rd IN THE WORLD
GRAS 2021

TOP 100
- Anthropology
- Archaeology
- Architecture/built environment
- Geography
- Medicine

QS 2021

TOP 100
Social sciences and public health
65th IN THE WORLD
US NEWS 2022

Psychiatry/ Psychology
88th IN THE WORLD
US NEWS 2022

Sport Science Schools and Departments
47th IN THE WORLD SHANGHAIRANKING 2020

Key terms

ARWU Academic Ranking of World Universities
CWUR Centre for World University Rankings
GRAS ShanghaiRanking Global Ranking of Academic Subjects
ShanghaiRanking Global Ranking of Sport Science Schools and Departments
QS Quacquarelli Symonds
THE Times Higher Education
US NEWS US News & World Report Best Global Universities

2019 PUBLICATIONS

1 936.02
PUBLICATION COUNT (UNITS)*

R253 million
Subsidy income: publication

3 337
NUMBER OF JOURNAL ARTICLES

3 233
NUMBER OF AUTHORS (ALL OUTPUTS)

16
NUMBER OF BOOKS

262
NUMBER OF CHAPTERS IN BOOKS

195 NUMBER OF CONFERENCE PROCEEDINGS

500
NRF-RATED RESEARCHERS
The National Research Foundation allocates ratings based on a researcher's recent research outputs and impact, as perceived by international peer reviewers. 12% of the country's rated researchers are at UCT.

30
A-RATED RESEARCHERS
A-rated researchers are international leaders in their field. 25% of the country's A-rated researchers are at UCT.

42
SARChI CHAIRS
Department of Science and Technology/National Research Foundation South African Research Chairs are designed to strengthen the ability of the country's universities to produce high-quality research, innovation and students. Nearly 20% of the country's SARChI Chairs have been awarded to UCT.

INCOME

R1.52 billion
external research income in 2020

R355 million
postgraduate funding (all sources)

R86 million
funding for postdoctoral fellows

* The publication figures are for accredited (subsidy-generating) outputs only, published in the preceding year. Latest figures available at the time of going to print: October 2021.

THE Impact Rankings 2021
OVERALL RANKING

101-200 BAND

The Impact Rankings for SDGs that UCT submitted:

- SDG 1 – no poverty: **40th (tied)**
- SDG 5 – gender equality: **58th (tied)**
- SDG 10 – reduced inequalities: **94th**
- SDG 3 – good health and well-being: **101–200 band**
- SDG 16 – peace, justice and strong institutions: **101–200 band**
- SDG 17 – partnerships for the goals: **101–200 band**

After the devastating runaway fire on Table Mountain that gutted the Jagger Reading Room in the UCT Libraries, and the Special Collections it housed, over 2 000 staff, students, volunteers and international experts came together in an extraordinary salvage operation. Ten thousand items are now in cold storage as part of the rehabilitation process for water-damaged materials, and priceless items have been saved.

2020 CONTRACT RESEARCH

1 793
RESEARCH CONTRACTS SIGNED

RESEARCH CONTRACT VALUE
R2.18 bn

VALUE OF FOREIGN RESEARCH CONTRACTS SIGNED
R1 .67 bn

VALUE OF LOCAL RESEARCH CONTRACTS SIGNED
R512 m

IP PROTECTION

INVENTION DISCLOSURES
27

PATENT APPLICATIONS FILED
64

PATENTS GRANTED
26

2020 INNOVATION

LICENCE INCOME
R2.1 m

EQUITY IN SPIN-OFF COMPANIES
9

LICENCE AGREEMENTS (OUTBOUND)
23*

*Includes option and assignment agreements

27
SPIN-OFF COMPANIES TO DATE

2 NUMBER OF SPIN-OFF COMPANIES STARTED IN 2020

181 Active IP rights to date

23% active portfolio commercialised

51% relate to human health

CLICK HERE TO READ MORE IN ***Innovation at UCT 2020***

A WINDOW INTO SOME KEY DRIVERS OF UCT'S RESEARCH AGENDA AND VISION IN 2020/21

The 2020/21 research year at UCT was influenced, as was the case elsewhere, by the impact of COVID-19, and particular to UCT, the unfurling of UCT's Vision 2030. While we rallied and pivoted to respond to varying lockdown levels, ongoing uncertainty in business models and the urgency of our pandemic-focused research initiatives, we simultaneously set our sights on UCT's role in "unleashing human potential for a fair and just society" and enhancing our research agenda towards "unleashing knowledge in, for and from Africa to redefine and co-create a sustainable global future".

Despite the pandemic – and, in fact, driven by the increased urgency created by COVID-19 – the last year at UCT has seen several seminal events informed by and feeding into our forward thinking.

The SDGs Africa summit – towards the Africa we want

Delayed from April 2020 by the pandemic, the online **International Summit on the SDGs in Africa**, hosted by UCT in September 2021, focused on the need to accelerate an Africa-centric approach to moving towards sustainable development in Africa and achieving Agenda 2063 and the associated SDGs.

We brought together a wide variety of thinkers and doers from the continent and the rest of the world. Together they helped us create a strong focus on Africa, to launch an action-oriented collaboration that will extend beyond the summit and drive our research agenda.

We built this through the seeding of ideas for innovative actions by eminent thinkers drawn from global scholars, activists, business and government; and building context through cross-cutting panel discussion, we prepared the ground for the ongoing work of our **seven thematic tracks** to refine position papers and action plans.

Our take-home messages included the imperative for integrated, cross-cutting solutions developed collaboratively; the centre-staging of justice; recognising the need to work across multiple time horizons; celebrating and accommodating diverse perspectives, to exclude none; and importantly, the need to meet African challenges with solutions that are sensitive to the context of Africa, and led by Africans in

> Driven by the increased urgency created by COVID-19, the last year at UCT has seen several seminal events informed by and feeding into our forward thinking.

a manner that balances an Africa focus with our position in a global world. Some 1 650 delegates from 85 countries – 40 in Africa – registered and contributed to a rich fabric of outcomes.

Find out more at the Summit website **here**, and view some highlights **here**. A report from the summit will be available soon – keep an eye on the site dedicated to the SDGs at UCT **here**.

Vaccines for Africa from Africa

As it did for universities the world over, the pandemic brought enormous challenges and opportunities to the research endeavour at UCT. In **Research & Innovation 2019/20**, we covered the impressive way in which our researchers pivoted to address a range of issues around COVID-19. This has continued, and you will see some accounts of that work in this publication.

The pandemic has brought home starkly the impact of being a follower in the technology agenda, and highlighted the importance of discovery science and its translation into impact, economy and quality of life. In **this live event**, held on 26 October, we both celebrated the reach, diversity and excellence of **UCT's research focused on vaccines** in Africa from Africa, and brought into crystal-clear focus the challenges and opportunities associated with developing vaccine manufacturing capability on the continent – the latter through the keynote address of Patrick Soon Shiong of NantWorks, and the panel discussion bringing together leaders in Africa's vaccine initiatives, leaders of commercial vaccine facilities in South Africa, and academics.

A resulting take-home message focused on the imperative of integrating manufacturing capacity with vaccine discovery, vaccine process development, epidemiology studies and clinical studies to build preparedness for the epidemics of the future – with a clear Africa focus.

See recordings of the key speakers here.

On being human – past and future

Increasingly we recognise that embedding our understanding of being human impacts every aspect of our development, across all spheres. We highlight events focused on our history and our future. The Khoi and San Centre at UCT was launched in September, through a summer school webinar: 'Knowing on the wind – #oabo #ans'.

The centre focuses on African philosophies and epistemologies, through socially engaged research partnerships in San and Khoi studies and on foregrounding endangered indigenous languages. Read more in the article here.

The Institute for Humanities in Africa (HUMA) launched its 'future hospitals' programme, bringing together the role of artificial intelligence (AI) and the fourth industrial revolution (4IR) with the ethics of healthcare in Africa. The introductory workshop in March 2021 has been followed by webinars and discussions, building a Carnegie-funded programme across Africa.

Professor Sue Harrison,
DEPUTY VICE-CHANCELLOR FOR RESEARCH AND INTERNATIONALISATION

RESEARCH NEWS & FEATURES

01 UCT JOINS MISSION ATLANTIC

The global project will shed light on environmental risks posed and their effects on the Atlantic Ocean ecosystems.

UCT's Dr Lynne Shannon from the Department of Biological Sciences will join experts from Europe, South America and North America to participate in this global study.

Mission Atlantic is an €11.5 million initiative funded by one of the European Union's (EU) Horizon 2020 programmes. It aims to identify the current and imminent environmental impacts from climate change, natural disasters and human activities on the Atlantic Ocean systems.

The initiative is the first of its kind to develop and systematically apply integrated ecosystem assessments (IEAs) at the Atlantic basin scale. This unique approach engages scientists, marine stakeholders and resource managers, and incorporates all components of the ecosystem – including human activity – into the decision-making process.

Through this, project managers and policymakers will be entirely informed by science and will be able to balance the need for environmental protection with secure, sustainable development.

"We are excited to undertake IEAs that build upon some of the initial ecological and climate risk assessments previously done in the region," Shannon said.

CLICK HERE TO READ THE ARTICLE

02 DECODING THE HORNS OF THE **'DEVIL RAY'**

The horn-like features of the manta ray earned it the nickname 'devil fish'. But new research shows they may influence how the fish communicates.

Michelle Carpenter, a PhD student in the Department of Biological Sciences, was involved in the collaborative study with researchers from Macquarie University, the University of Papua and the Marine Megafauna Foundation.

Published in the journal *Behavioural Ecology and Sociobiology,* it suggests the movement of manta ray horns – known as cephalic lobes – may be important in social communication or in sensing the local environment.

Describing a variety of specific lobe positions and movements in different behavioural contexts, they say flicks of the lobe tips were performed more frequently when rays were facing another individual. Tight rolling of the lobes was associated with being followed by others.

While the study shows strong evidence for mantas using their cephalic lobes for sensing, Carpenter says that they still need stronger evidence. This next step will be carried out by Carpenter and UCT Honours student Hannah Stewart.

The two will focus on the behaviour of manta ray populations in Mozambique – preferably when they aren't feeding or being cleaned, which will be no mean feat.

"The thing with animal behaviour is there's so much going on, so [many] stimuli around them. The challenge is isolating [a] certain stimulus," Carpenter said.

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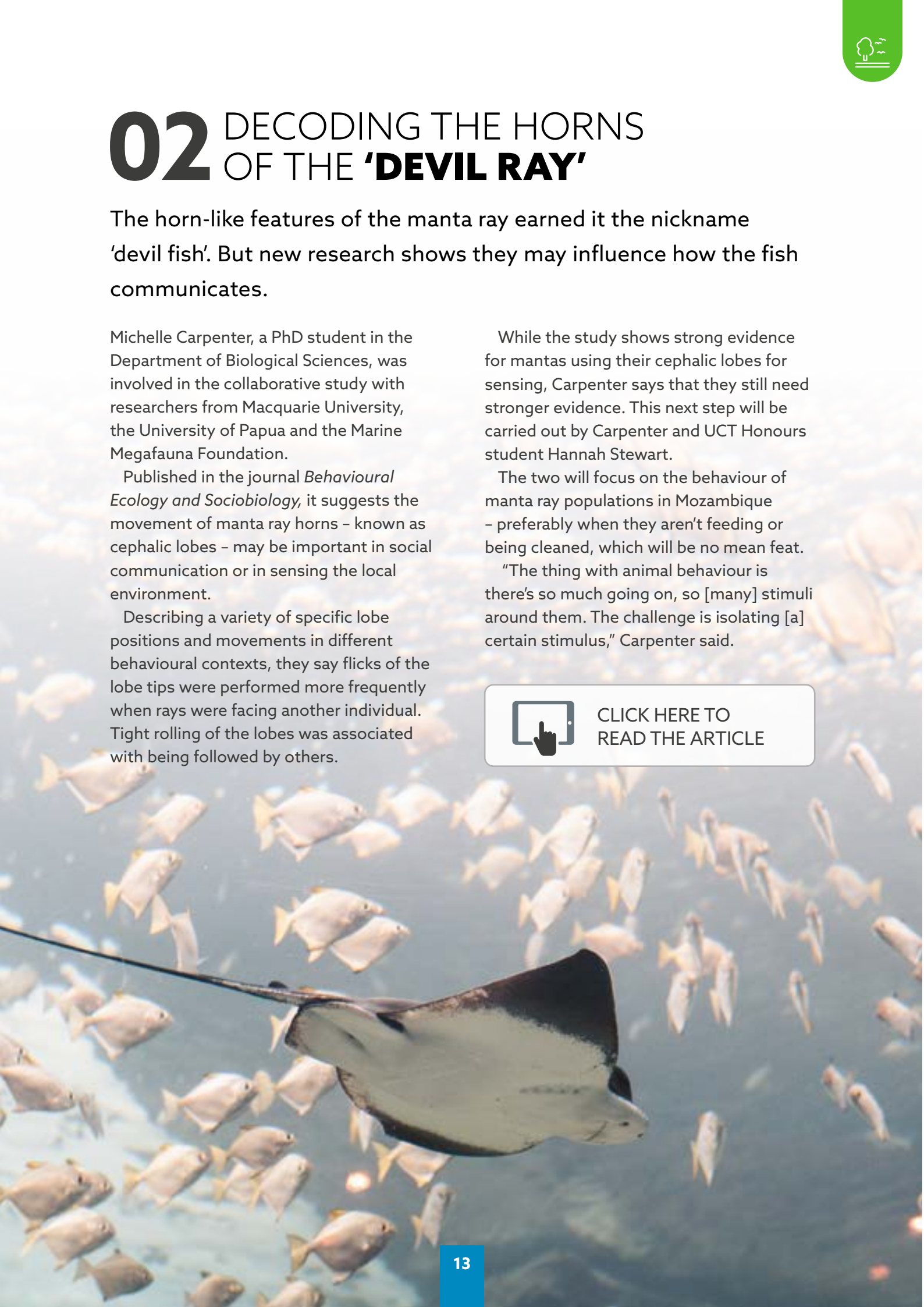


03 UNCOVERING THE EXPANSIVE **AFRICAN GENOME**

An estimated three million novel genetic variants in over 300 genomes have been discovered through a new, large-scale African collaboration involving UCT researchers.

The Human Heredity and Health in Africa (H3Africa) consortium – which includes academics from UCT – participated in the study, which explored the breadth of genomic diversity across Africa.

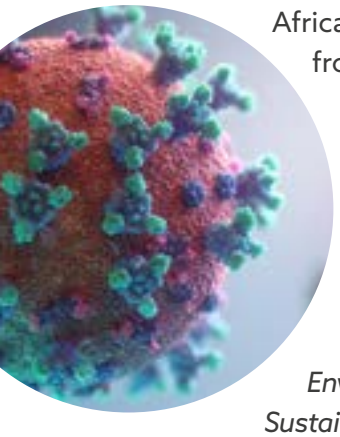
Whole genome sequencing was carried out on 426 individuals from 13 African countries, of which 314 were analysed in depth. Findings revealed extensive genomic diversity among these genomes, even within countries and regions, with unique variants identified in each ethnolinguistic group.

"This reflects the long history and rich genomic diversity across Africa," said **Professor Nicola Mulder** from the H3ABioNet.

CLICK HERE TO READ THE ARTICLE

04 **ANALYSING COVID-19** FROM AN AFRICAN PERSPECTIVE

Paper identifies contextual features to consider in ongoing efforts to limit the spread of COVID-19 and mitigate its impacts on the continent.



"It seemed to me that there was precious little analysis of COVID-19 in African contexts, and especially from a broader social science perspective rather than an epidemiological or public health perspective," said **Professor Ralph Hamann** from the UCT Graduate School of Business (GSB).

In work published in the journal *Environment: Science and Policy for Sustainable Development*, Hamann and colleagues from Kenya, Mauritius, Nigeria and South Africa identified five contextual features to consider.

These included a specific focus on the ability of people living in informal settlements to adhere to 'shelter-in-place' rules, consideration of poverty and food insecurity on the continent, and the lack of fiscal and organisational resources.

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05 TACKLING AFRICA'S **GROWING BURDEN OF STROKE**

With the pan-African African Stroke Organisation, UCT researchers help address the continent's unique risk factors.

The African Stroke Organisation brings together stroke researchers, clinicians and other healthcare professionals from across the continent to drive research, capacity building, development of stroke services, and collaboration with all stakeholders.

"Its role is to address the rising rates of stroke on the continent, as well as the high rates of death and disability that can follow," said the founding researchers in an article in **The Conversation**.

Among those members are UCT's Professor Alan Brye, consultant neurologist Kathleen Bateman, head of the Division of Neurology Lawrence Tucker, and Honorary Professor Pamela Naidoo.

Stroke is a leading cause of disability, death and dementia worldwide. Over 20% of people in Africa are at risk of stroke at some point in their life. Fortunately, the vast majority of stroke risk factors are modifiable – and thus most strokes may be avoided.

Tackling this requires an African organisation, the group says, because there are combinations of risk factors that are unique to the continent. A good example of this is hypertension working in concert with diabetes and high levels of cholesterol in the blood. Research, education and policy responses need to focus on these factors singly and in combination, the researchers said.

"Tackling the escalating burden of stroke on the continent requires prioritised, multi-pronged and intersectoral strategies. These must be tailored to the epidemiological, cultural, socioeconomic and lifestyle landscape in African countries."

CLICK HERE TO READ THE ARTICLE

06 COVID-19 IMPACTS ON MEN

Worldwide, men infected with COVID-19 are three times more likely to need intensive care, highlighting the need for more research into how sex differences can impact disease.

After finding that women have better early antiviral response than men, researchers from UCT and University College London (UCL) gathered COVID-19 reports from global hotspots to study whether this might give them relative protection from viral infections.

Their results, published in *Nature Communications*, reveal that the men and women studied had an equal chance of being infected. Of those infected, however, men had higher rates of hospitalisation, and a 40% higher chance of dying from COVID-19 compared to women.

"We know that men, in general, have poorer immune responses to many different infections. Women on the other hand generally have a stronger immune response to infections," said Dr Kate Webb, from UCT's Department of Paediatrics and Child Health, who collaborated on the research.

The findings could help contribute to vaccine development, and to better predict who is at risk of severe disease. They also reveal a gap in the knowledge landscape that future research projects could fill.

"The findings should empower researchers to ask why we see these differences, and how we can exploit this information in the fight against COVID-19," said Webb.

> "Women have a better early antiviral response than men. This might give them relative protection from viral infections.

CLICK HERE TO READ THE ARTICLE

07 ALL-WOMEN TEAM REPORTS ON **CARDIOVASCULAR DISEASE IN WOMEN**

The first global report on the disease among women was presented by a women-led *Lancet* commission.

Key findings were presented at the American College of Cardiology's 70th Annual Scientific Session, revealing that 35% of deaths in women worldwide are attributed to cardiovascular disease (CVD). Mortality among young women is also on the rise.

In 2019, 275 million women were diagnosed with the disease and 8.9 million women died because of the disease, according to the report. Despite being the leading cause of death in women each year, CVD in women remains under-studied, under-recognised, under-diagnosed and under-treated, with women under-represented in clinical trials.

There are considerable geographical differences in CVD, with the highest age-standardised prevalence in North Africa and the Middle East. South American countries showed the lowest prevalence.

The report says that evidence of significant regional trends highlights the need for improved data collection, at local and regional levels, to effectively present, recognise and treat the disease in women.

Authored by 17 experts from 11 countries, the report included UCT's acting deputy dean for research in the Faculty of Health Sciences, Professor Liesl Zühlke. She was the only African among the commissioners.

"This commission's work is both a starting point and a call to action, to mobilise and energise healthcare professionals and policymakers – and women themselves – to work towards a healthier future," Zühlke said.

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08 FEMALE POLITICAL PRISONERS AND PRISON GUARDS GIVEN A VOICE

Rare collection communicates an as-yet unseen female perspective on the anti-apartheid struggle.

The Malibongwe Women's Archive project – spearheaded by Dr Janie Cole from the UCT College of Music, with the UCT Libraries Special Collection – presents a uniquely female view of what it was like to be a woman during the struggle against both racial discrimination and oppression.

"This cultural-heritage preservation project will provide a new perspective on the standard liberation struggle narrative, by embracing gender issues that historically have been overlooked," said Cole.

Presenting interviews, original music tracks and personal items such as photos, diaries and letters, the goal of the archive is to chart the active role of women against apartheid.

Apart from its cultural, historical and political significance, the Malibongwe Women's Archive will also be an educational treasure chest for future generations.

"It opens up all kinds of exciting possibilities in education and curriculum development," said Cole. "It is particularly aligned in the wider academic context of decolonisation efforts in historical musicology, ethnomusicology and African studies, as well as in UCT archival collections."

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09 FOCUSING ON RURAL WOMEN TO DRIVE LAND REFORM

UCT researchers play pivotal role in ruling that rent on communal land has an adverse effect – mostly on women.

The Ingonyama Trust, based in KwaZulu-Natal (KZN), was found to have acted in violation of the Constitution by giving residential leases to those who were true owners of the land in terms of Zulu customary law.

Nolundi Luwaya, director of the Land and Accountability Research Centre (LARC), is based at the Department of Public Law. Her work led to its involvement in the Ingonyama Trust case.

In 2015, LARC researchers found that the Trust was downgrading people's land rights. LARC was part of a collective challenging the legality of this practice.

The court ordered the Ingonyama Trust to refund all lease money paid, and ordered the granting of rights in terms of applicable KZN legislation.

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10 UCT LEADS GLOBAL STUDY ON **DISINFORMATION**

An international study on information disorder in the Global South was launched by Professor Herman Wasserman.

> “The rising tide of disinformation about the COVID-19 vaccine is a very worrying development.

Launched in January 2021, the project aims to map the misinformation space, identify actors and develop frameworks for intervention.

Wasserman, from the Centre for Film and Media Studies (CFMS), will coordinate data submitted from four sub-regions of the Global South: Latin America, sub-Saharan Africa, Asia, and the Middle East and North Africa.

“The input of stakeholders in these regions will be crucial to the project, as they will provide the local expertise and insights drawing on their work in the area of misinformation,” he said.

Despite disinformation being a widespread problem in countries in the Global South, the study of the phenomenon remains dominated by examples, case studies and models from the Global North. This new study will provide insights from the Global South that can help fill knowledge gaps and present opportunities for inter- and intraregional cooperation.

COVID-19 presented a case for urgency around researching misinformation – in particular, the rise of conspiracy theories and rumours, such as miracle cures and disinformation around the virus.

“The rising tide of disinformation about the COVID-19 vaccine is a very worrying development,” Wasserman added.

This has led some countries in the Global South, such as South Africa and Brazil, to criminalise disinformation. However, these attempts have raised concerns that governments might use the pandemic as a smokescreen to stifle free expression and avoid political accountability.

“In other words, the ‘information disorder’ is a global problem, but has specific characteristics in the Global South, which remains under-researched,” Wasserman said.

CLICK HERE TO READ THE ARTICLE

11 SDGS IN THE **AFRICAN CONTEXT**

Africa and the Sustainable Development Goals critically traces the SDGs and the conditions under which they are implemented in Africa.

Co-edited by **Professor Maano Ramutsindela**, the book brings together over 80 researchers from five continents to demonstrate an equitable global partnership in the production of knowledge relevant to the Sustainable Development Goals (SDGs) in Africa.

The book is unique in its critical assessment of SDG development and the conditions under which they are implemented in Africa.

"It highlights how a diverse group of scholars interprets the intersection of certain SDGs and local conditions in particular parts of Africa, while also accounting for national and regional development frameworks and priorities," said Ramutsindela.

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12 AFRICAN UNIVERSITIES **DRIVING URBAN CHANGE**

The New African Urban University project supports transdisciplinary research that fosters sustainable urban transitions.

Launched by **Associate Professor Zarina Patel**, the one-year project will forge new partnerships aimed at strengthening the role of African universities in urban change. This will be done during four workshops throughout the year, focused on knowledge exchange and agenda-setting.

The project was launched in the context of a global urban focus, as seen in Sustainable Development Goal (SDG) 11, which aims to make cities and settlements inclusive, safe, resilient and sustainable.

According to Patel, heightened levels of inequality because of COVID-19 have catalysed the urgency for universities to exercise their convening power and influence to address urban transformation.

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13 AFRICANS UNABLE TO IMPLEMENT **COVID-19 INTERVENTIONS**

An international study reveals hundreds of millions of Africans lack access to the basic facilities needed to prevent the spread of COVID-19.

At the start of the pandemic, governments across the globe implemented public health measures such as wearing masks, strict lockdown measures, physical distancing and regular handwashing.

However, research from 54 countries across the continent reveals almost 900 million lack on-site water, and 283 million live in households with more than three people to a room.

The findings, based on socio-economic data gathered in previously conducted studies, show how seemingly simple measures have been all but impossible to implement and maintain on the continent.

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14 UCT PARTNERS WITH NASA FOR FIRST-OF-ITS-KIND BIODIVERSITY SURVEY

BioSCape will see scientists from the United States and South Africa collaborating to map marine, freshwater and terrestrial species and ecosystems.

Dr Jasper Slingsby, a senior lecturer in Plant Ecology and Global Change Biology at UCT, is part of the project team coordinating the roll-out starting in 2023.

"The campaign involves NASA coming here with two of their planes and the latest and greatest in sensor technology to capture hyperspectral images of key focal areas within the region," he said.

Apart from collecting ultraviolet, visual and thermal imagery, the height and structure of vegetation will also be measured using light distance and ranging (LiDAR) technology. Satellites will gather additional data, while teams on the ground make observations at locations of particular interest, logging any plants and animals they detect.

Using these data, the team will map the region's biodiversity, providing estimates of the distribution and abundance of species, and of the boundaries of ecosystems. Ultimately, the campaign will help scientists understand the structure, function and composition of ecosystems in the study area.

The project has implications that go beyond science, said Slingsby. "NASA is a household name that conjures images of rockets and walking on the moon, yet they want to come to the Cape. When most people think of botany or zoology, they don't imagine you could end up working with NASA, but there you are!"

CLICK HERE TO READ THE ARTICLE

15 NEW GALAXIES IDENTITFIED

A team of scientists including UCT have identified 20 new galaxies using the MeerKAT telescope.

A team of scientists representing three South African universities, including UCT, were pleasantly surprised when their usual studies of the sky revealed a rather unusual find: 20 new, previously unidentified galaxies.

The serendipitous revelation was detected by members of the MeerKAT International GHz Tiered Extragalactic Exploration (MIGHTEE) project team. The team of scientists study the demographics, evolution and conditions of galaxies in a variety of environments.

Their recent, ultra-cool discovery was made possible by the ingenuity of the MeerKAT telescope – the South African precursor telescope to the Square Kilometre Array (SKA).

"The discovery cements the leading role that UCT plays in many MeerKAT projects, which provide a rich environment for discoveries and research excellence to thrive," said the project's Dr Bradley Frank, from the Department of Astronomy.

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16 MONITORING VEGETATION WITH **SIMULATED SATELLITES**

Dissertation shows role replicated satellites can play in reaching South Africa's vegetation monitoring goals.

The work, carried out by UCT SpaceLab master's student Brendon Maongera, focused on building a simulated satellite camera and assessing and monitoring its effectiveness using a testbench – a special station developed to test a mechanism using software and hardware tools.

The goal was to identify the benefits of using a replicated satellite for capacity building, and to showcase how it can benefit vegetation monitoring in South Africa.

The project will add to the advantages of using space applications in ways that have "never been thought of before", to help solve some of the continent's challenges, said Maongera.

It also offers students the opportunity to learn special skills such as spacecraft modelling and satellite operations, and teaches them how to use satellite software currently being employed in the space industry.

"This will help us with new research on space that is likely to benefit our country, our continent and the world," Maongera said.

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17 WILD FOOD PLANTS AT RISK FROM CLIMATE CHANGE

Climate warming could reduce the range of wild-harvested food plants in southern Africa by a third.

Wild-harvested food plants are important ingredients in the diets of millions of people, especially during times of hardship when staple crops fail. Although they contribute to food security in southern Africa, little is known about the risk that climate change poses to these edible plants

UCT's Carina Wessels, who at the time was affiliated with the African Climate and Development Initiative (ACDI), in collaboration with ACDI's Dr Christopher Trisos and colleagues from the University of Connecticut, began to fill that gap.

Examining the links between climate change, traditional knowledge, food security and wild-harvested food plants, they investigated the climate change risk to 1 190 wild food plant species used by 19 native language groups in the region. These include the num-num, the sour fig, rooibos and the marula fruit.

The team considered two future greenhouse gas scenarios. In the low-emissions scenario, global warming is likely to have stayed below 2°C higher than pre-industrial levels by 2081–2100. The high-emissions scenario represents a future reaching more than 4°C of global warming by the end of this century.

Results show the ranges of 40% of wild food-plant species will probably shrink in the low-emissions scenario. Roughly six out of every 10 wild-food species, however, are expected to expand their range.

> “66% of wild food plant species are projected to experience range reduction.

This pattern is reversed in the high-emissions scenario: 66% of wild food plant species are projected to experience range reduction, and only 34% to experience a range increase.

“There is a mix of winners and losers in a world that is up to 2°C warmer,” Trisos said. “If we allow warming beyond this threshold, however, there will be more losers than winners.”

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18 UCT LAUNCHES FIRST **SESOTHO OPEN-ACCESS BOOK**

Shining a spotlight on teenage pregnancy in South Africa, the story emphasises the importance of strong family ties.

Dikeledi ha di wele fatshe (loosely translated as 'Tears do not fall in vain') was authored by **Dr Rethabile Possa-Mogoera** from the Department of African Languages and Literatures. Published by UCT Libraries, it is also available on the open-access continental platform, which means it's accessible to readers outside the campus community.

The book is aimed at high-school learners and introduces the concept of teaching and learning an indigenous language using technology. It tells the story of a teenage girl, Mamello, who becomes pregnant in Grade 8; and the ensuing fracas between her family and that of the baby's father.

Ultimately, Mamello's father supports her pregnancy, which is social commentary from Possa-Mogoera: "This book seeks to change the status quo, where – in most cases – mothers are always supporting their pregnant daughters, while fathers steer clear. In this case it's different."

Acknowledging the book's relevance, the national Department of Basic Education has expressed an interest in including it on its reading list.

"This new book is a contribution to the restoration of the value of African culture and languages, and is an important step towards decolonising higher education," said UCT Vice-Chancellor Professor Mamokgethi Phakeng. "This is good; not only for Africans, but for the world."

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> "This new book is a contribution to the restoration of the value of African culture and languages, and is an important step towards decolonising higher education.

19 RARE AFRICAN ORCHIDS REVEAL WORLD FIRST

First clear case of a plant sexually deceiving a beetle found in near-extinct *Disa forficaria* orchid.

This is the result of work by Dr Callan Cohen, from the FitzPatrick Institute of African Ornithology, who made the discovery alongside a team of local and international researchers.

Disa forficaria was last seen in 1966. Only 11 of these plants have been found in the last 200 years, making it one of the rarest plants in the world.

While monitoring a newly blossomed Disa forficaria, Cohen discovered what was to become the first clear case of a plant sexually deceiving a beetle. With further research, an entirely new chemical system has been identified in the rare plant's deception.

But that's not all. The scientists also revealed that some of the orchid-pollinating beetles were carrying pollen from at least two other Disa plants, proving the plant is not extinct.

Now, the researchers are pioneering the process of using pollination to survey for the presence of critically endangered plants.

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20 HOW TO ADDRESS THE COMPLEXITY OF CLIMATE CHANGE

Global team presents a framework for considering how drivers of risk interact in climate action.

Led by researchers from the Africa Climate and Development Initiative (ACDI), the team of 21 scholars presented a framework for better understanding and informing decision-making around climate change risks in Africa and globally.

Published in the journal *One Earth,* it builds on existing risk frameworks, with the hope that the guidelines can help decision-makers, managers and researchers understand the inherent complexity of climate change.

"This is important because policymakers may worry about the risk of implementing a response as much, or more so, than the risk the response aims to reduce," said Dr Nick Simpson, the lead author of the paper and a postdoctoral fellow at the ACDI.

"This can lead to inaction, at the very time when we need to be most active and investing heavily in our response to climate change."

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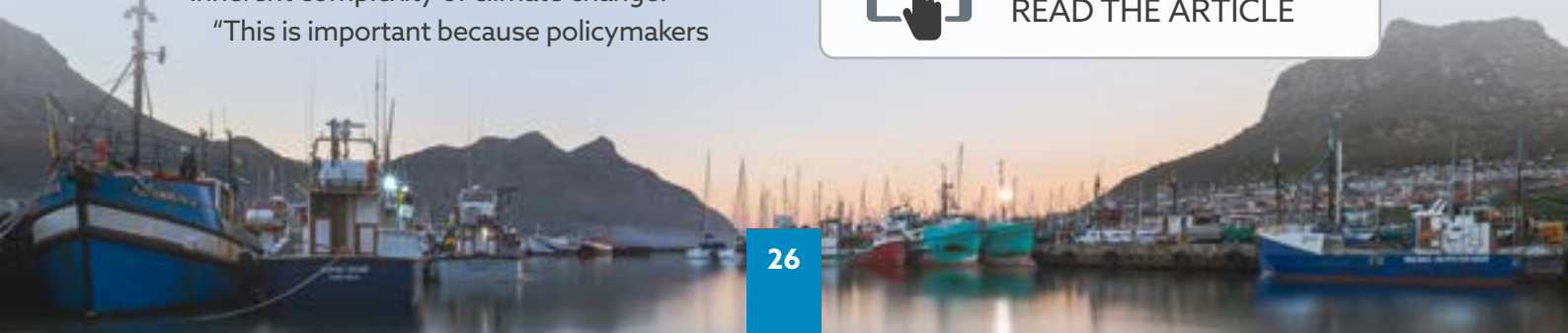

21 MAKING STRIDES TOWARDS CO_2 HYDROGENATION TECHNOLOGY

Researchers reveal promising gains in producing sustainable fuels and chemicals with a significantly lower carbon footprint.

A team of researchers from the Catalysis Institute at UCT and integrated energy and chemical company Sasol have made advancements in the use of commercial iron catalysts produced cheaply and on a large scale by Sasol. These will enable conversion of biogenetically derived carbon dioxide (CO_2) and green hydrogen directly to a variety of green chemicals and jet fuel.

According to the researchers, the iron catalyst can achieve CO_2 conversions greater than 40% – producing ethylene and light olefins, which can be used as chemical feedstocks, and significant quantities of kerosene-range hydrocarbons (jet fuel).

For decades Sasol has been using its Fischer-Tropsch (FT) technology to convert low-grade coal and gas into synthetic fuels and chemicals. In this partnership, Sasol blends its expertise around FT catalysis and synthesis gas conversion with UCT's modelling and in-situ characterisation capabilities.

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22 CLOSER TIES WITH THE PERMANENT COURT OF ARBITRATION

A court representative in South Africa will be drawn from UCT's Faculty of Law.

This has been achieved through a memorandum of understanding (MoU) signed between the Permanent Court of Arbitration (PCA), based in The Hague, the Netherlands, and UCT. The agreement also includes the establishment of a fellowship programme for UCT graduates at The Hague.

Dean of Law Professor Danwood Chirwa recently signed the MoU with Ambassador Hugo Siblesz, the secretary general of the PCA in The Hague.

The PCA is a specialist intergovernmental arbitral institute that specialises in the administration of arbitration, conciliation and other dispute resolution procedures among various combinations of states, state entities, intergovernmental organisations and private parties.

The PCA also has a strong academic and research arm through its association with the International Council for Commercial Arbitration (ICCA), which produces key international arbitration publications.

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23 MAKING ECOLOGY **MORE EQUITABLE**

Paper proposes five interventions to build a more anti-oppressive and decolonial ecology.

Ecological research and practice are crucial to understanding and guiding more positive relationships between people and ecosystems. However, research co-authored by Dr Chris Trisos, from UCT's Africa Climate and Development Initiative (ACDI), says the discipline has been shaped and held back by exclusionary Western approaches.

One area the researchers highlight is the use of English as the dominant form of knowledge communication in science. This, they say, can lead to publication bias against scientists for whom English is not a first language.

Access to scholarly literature and data resources is another issue. Data and research papers are often locked behind a paywall or housed in servers and museums in the Global North, even when the data collected was from the Global South.

Analysis of change in social-ecological systems must consider the impacts of colonial histories and offer solutions in a decolonial framework, says the paper. In promoting this, it proposes five interventions for practising ecology in a reflective, equitable and inclusive way.

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1. **Decolonise your mind,** to include multiple ways of knowing and communicating science.
2. **Know your histories**, to acknowledge the role research has played in enabling colonial and ongoing violence against peoples and nature, and begin processes of restorative justice.
3. **Decolonise access**, by going beyond open-access journals and data repositories to address issues of data sovereignty and the power dynamics of research ownership.
4. **Decolonise expertise**, by amplifying diverse expertise in ecologies from local experts and giving due credit and weight to that knowledge.
5. **Practise ethical ecology in inclusive teams**, by establishing diverse and inclusive research teams that actively deconstruct biases, so all team members are empowered participants in developing new knowledge.

"These actions are not offered as a checklist capable of undoing unjust systems worldwide, nor to overshadow long histories of place-based anti-colonial and anti-racist struggle, but as connection points to action for practising ecologists," said Trisos.

24 FAIR COMPENSATION FOR COMMUNITIES AFFECTED BY MINING

The many ways in which rural residents use and are connected to their land must be weighed up, say researchers.

Recent work from the Land and Accountability Research Centre at the Department of Public Law sought to identify elements that need consideration to ensure just and equitable compensation for communities displaced by mining.

Commonly, compensation analyses such as this are focused on the market value of land or immovables such as homesteads. However, the centre's research proposes that this should be broadened to include valuation of the economic and cultural aspects of rural residents' dependence on their land to support their livelihoods.

The research focused on residents of Makhasaneni, consisting of about 300 households in the KwaZulu homeland. It found that all households in the area were involved in activities that relied on the land, including access to home gardens, firewood, honey and medicinal plants.

These activities not only provide a valuable food source but play a social role as well. Indeed, the researchers revealed the communities' interaction with the landscape is firmly embedded in their local identity.

"The many ways in which rural residents use and are connected to their land need to be weighed in their full complexity to arrive at an understanding of what it means to place an individual in the same position that he or she would have been, had the disruption and dislocation from their land not occurred," concluded the researchers in an article in **The Conversation**.

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25 SCIENTISTS DEVELOP NEW **SKIN TEST FOR TB**

The new method is a non-invasive, quick and highly accurate way of detecting the disease.

The new diagnostic pathway, called A-Patch, includes nano sensors which detect TB compounds emitted from the skin. A specifically designed sensor array translates these findings into a point-of-care diagnosis by discriminating between active pulmonary TB patients and controls, with sensitivity above 90% and 70% specificity.

"This fulfils the World Health Organisation triage test requirements and has the potential to become a TB triage or screening test," said Professor Keertan Dheda, the head of UCT's Centre for Lung Infection and Immunity.

Dheda and colleagues tested the tool on a sample of 320 people in Cape Town and 316 in New Delhi in India. This study population included newly diagnosed and confirmed pulmonary-active TB cases, healthy volunteers, and confirmed non-TB cases. The results were published in the journal *Advanced Science*.

About 95% of TB cases occur in developing countries, including locations where people live on less than US$1 per day. About one-third of the world population has latent TB, with a lifetime risk of 5 to 10% of developing active disease.

"Implementing the sensor array approach into an adhesive bandage is an additional step towards a simple and cost-effective wearable patch to address the TB epidemic in both developing and developed countries," Dheda said.

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26 MINIMUM UNIT PRICE MAY **REDUCE HEAVY DRINKING**

Study reveals the pricing approach is more effective than excise tax at reducing heavy alcohol consumption.

Research published in the South African Medical Journal reveals that if government were to implement a minimum unit price (MUP) on alcohol products, it could substantially decrease heavy drinking. The MUP could also impact occasional heavy-drinking and intermediate-drinking households.

"A MUP, levied at an appropriate level, would substantially increase the price. This, in turn, would substantially reduce households' alcohol consumption," said Dr Grieve Chelwa, from the UCT Graduate School of Business (GSB).

Chelwa collaborated on the study with Professor Corné van Walbeek, director of the Research Unit on the Economics of Excisable Products.

It was also found that the MUP might have more of an immediate effect than an excise tax. This is because it would target low-priced products, which are disproportionately heavily consumed by regular heavy-drinking households, said the researchers.

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27 ENCOURAGING **HOLISTIC NARRATIVES** ABOUT CAPE TOWN COMMUNITIES

UCT PhD graduate deconstructs negative stereotypes, and the need for scholars to think carefully about race.

In her recently completed doctoral thesis 'Researching race, space and masculinities in Bishop Lavis: A critical ethnographic study", UCT PhD graduate **Simone Peters** aimed to showcase more holistic and alternative narratives about Bishop Lavis.

A suburb of Cape Town, Bishop Lavis is a community where many identify as 'coloured'. Peters argues that research involving these men and communities has painted them with negative stereotypes, describing them as at-risk, dangerous, gangsters and criminals.

Peters' research encourages readers and scholars to think carefully about how they talk and write about race, and the consequences of their work on these communities.

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28 WORLD'S FIRST **TOBACCO TAXATION E-LIBRARY**

The project is set to be a valuable resource for students, researchers and policymakers across the globe.

A comprehensive new e-library focusing on tobacco taxation and illicit trade has been launched by the World Health Organisation (WHO) Framework Convention on Tobacco Control (FCTC) Knowledge Hub at UCT's Research Unit on the Economics of Excisable Products (REEP).

A project two-and-a-half-years in the making, it consolidates and classifies all available literature on tobacco taxation and illicit trade in tobacco products. Currently the library includes links to more than 1 700 entries, including journal articles and presentations, data sets and grey literature.

While other e-libraries focusing on the economics of tobacco do exist, the WHO FCTC Knowledge Hub at REEP's e-library is the first of its kind focusing specifically on the aspects of taxation and illicit trade, said Professor Corne van Walbeek, director of REEP.

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29 TRACKING SA'S **POST-SCHOOL QUALIFICATIONS**

Siyaphambili reveals the number of young learners who attain a qualification after high school.

Meaning 'We are moving forward', Siyaphambili records the number of young South Africans who attain qualifications after high school and those who do not. It has been tracking post-school qualifications since 1994.

Siyaphambili studies post-school qualification attainment by population group, gender, age group and province. The data indicates that since 1994, the share of white and Indian populations with post-school qualifications increased by 15%, while the share of 'coloured' and black populations increased by 7%.

The data also show that a higher proportion (14.75%) of women obtained post-school qualifications compared with men (12.86%) in the 25-year period.

Siyaphambili's work reveals more needs to be done to achieve the government National Development Plans (NDP) target of 22% by 2030.

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30 COVID-19 SETBACKS FOR WOMEN AT WORK

Study shows decades of gains in gender equality in South Africa's labour market could be derailed by the pandemic.

This is according to a research paper by the Southern African Labour and Development Research Unit (SALDRU) examining industries adversely affected by the pandemic, and what impact that may have for gender equality in the labour market.

COVID-19 and lockdown have both affected some of the largest employment industries for women in the country. Four key sectors employing women were hardest hit, including the services sector, which employs about 31% of all women in work.

The research indicates that 66% of employed women are not classified as essential services staff, compared with 59% of employed men. And because of the nature of their jobs, these women could not work from home, resulting in a loss of income.

On the other hand, the study reported that some occupations dominated by women left up to 16% of them more at risk of contracting infectious diseases such as COVID-19. Such jobs included personal care workers, home-based care workers, doctors, nurses and pharmacists.

"The implications here for women who continued to work throughout the hard lockdown because they were classified as essential services staff, is that they were – and still are – more exposed to the virus," the researchers said.

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31 FINANCIAL IMPACT OF COVID-19 RESTRICTIONS

South African households face financial strain from COVID-19 restrictions, says a study from UCT's Liberty Institute of Strategic Marketing.

Using data from the National Income Dynamics Study-Coronavirus Rapid Mobile Survey (NIDS CRAM) surveys, the Liberty Institute examined the impact of restrictions on jobs and income across the economic spectrum.

The results reveal that having endured over 500 days of COVID-19 restrictions, many South Africans are still struggling to make ends meet. The biggest impact has been felt by those in poorly paid jobs. Indeed, by March 2021 there were nearly 1.15 million fewer people earning from jobs paying under R3 500 per month.

The data also indicates that middle-class and high-earning South Africans are also coming under relative financial strain. Not only are there fewer South Africans earning higher salaries than before lockdown, but the average salary for those earning over R40 000 per month has also fallen.

"The key point is that the situation is fluid, and therefore constantly changing," said Dr James Lappeman, head of projects at the institute. "The figures also suggest that although the economic pain is being felt across the board, it is the most vulnerable South Africans whose welfare is of huge concern."

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> "There were 1.15 million fewer people earning from jobs paying under R3 500 per month.

32 FIGHTING COVID-19 VARIANTS WITH T CELLS

UCT virologists reveal the body's T cells maintain 85% of their capacity to detect COVID-19 variants.

Central players in the body's immune systems, T cells are able to mount a substantial defence to prevent severe illness, hospitalisation and death from variants of COVID-19, say researchers Dr Catherine Riou and Associate Professor Wendy Burgers from UCT's Institute of Infectious Disease and Molecular Medicine (IDM).

In a pre-print article, they analysed the role of T cells in responding to the Beta variant; however, the authors predict similar results with Delta and other future variants. This is because the T cell response to infection with SARS-CoV-2 is far more multi-faceted than that of antibodies, providing a significant extra layer of protection against disease.

Growing fears around the resistance of COVID-19 variants to antibody defences has sparked increased interest in the role of T cells, that other major part of the immune response. As a result, the team has followed up this research with testing for T-cell response to the Delta variant.

Regardless of which COVID-19 variant is involved, Burgers and Riou are confident that existing vaccines will continue to protect populations from severe disease and hospitalisation.

"If a person becomes infected or gets vaccinated against the original strain rather than any variant, we've shown that it's very likely that the vaccine will induce a similar response to Delta, should that person encounter it," said Riou.

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AWARDS, GRANTS & ACCOLADES

33 UCT RANKS AMONG **WORLD'S BEST UNIVERSITIES**

The Times Higher Education (THE) Impact Rankings placed UCT in the top 100 for its impact on three of the United Nations' Sustainable Development Goals (SDG).

This was the first year that UCT participated in the THE Impact Rankings, which assess the impact of higher education institutions against SDGs. In addition to these top 100 rankings, the university was also placed in the top 101-200 band for three other SDG areas.

The Impact Rankings for SDGs that UCT submitted:

- SDG 1 – no poverty: **40th (tied)**
- SDG 5 – gender equality: **58th (tied)**
- SDG 10 – reduced inequalities: **94th**
- SDG 3 – good health and well-being: **101–200 band**
- SDG 16 – peace, justice and strong institutions: **101–200 band**
- SDG 17 – partnerships for the goals: **101–200 band**

Additionally, this year UCT has taken the continent's top place in the THE World University Rankings, the Quacquarelli Symonds (QS) World University Rankings, the Centre for World University Rankings (CWUR), ShanghaiRanking's Academic Ranking of World Universities (ARWU) and in the recent US News & World Report Best Global Universities Rankings.

The successes of UCT graduates were also acknowledged in international rankings. According to the QS Graduate Employability Rankings, UCT ranks among the top 100 universities in the world for having the most employable graduates.

"UCT shines as a place of excellence among the world's universities," said UCT Vice-Chancellor Professor Mamokgethi Phakeng. "We are grateful and proud to be in such a strong position; one we are working to harness for potential impact on the continent and beyond."

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34 TWO UCT PROFESSORS **AWARDED 'SCIENCE OSCARS'**

Professor Sheetal Silal and **Professor Michael Claeys** awarded at the National Science and Technology Forum (NSTF) South32 Awards, also known as the 'science Oscars'.

Their awards recognise the outstanding contributions Silal and Claeys have made to science, engineering, technology and innovation in South Africa.

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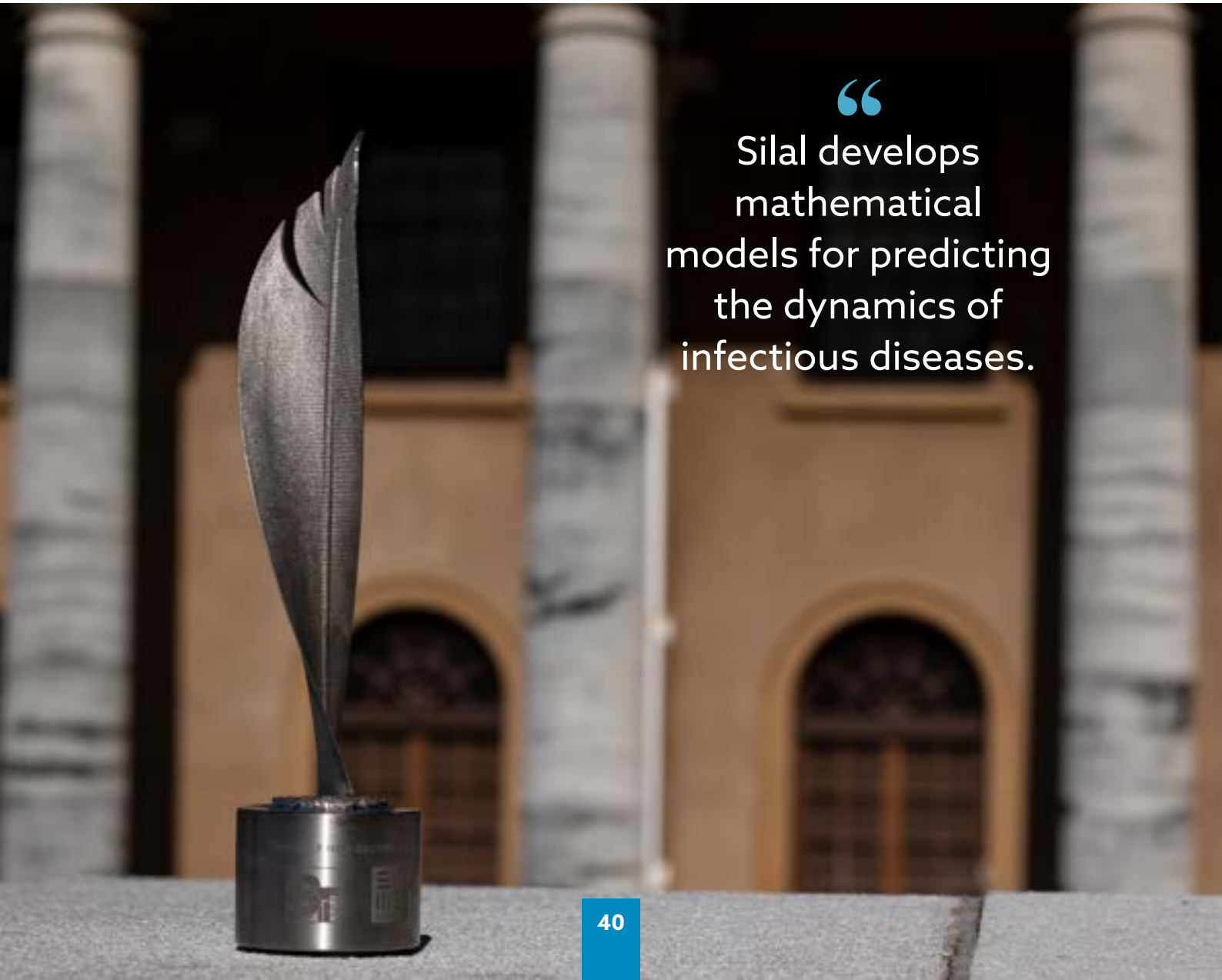

Silal was awarded the TW Kambule-NSTF Award: Emerging Researcher for her work developing mathematical disease models using knowledge from biology, clinical medicine, public health and economics. These can be used to shape health policy and improve public health.

Silal, an associate professor in the Department of Statistical Sciences at UCT and director of the Modelling and Simulation Hub, Africa (MASHA) is an expert in the development of mathematical models for predicting the dynamics of infectious diseases.

Claeys received the Engineering Research Capacity Development for his lifework on developments in catalysis, which lies at the heart of 90% of production processes for chemicals. Claeys is a professor in the Department of Chemical Engineering and director of the South African national DSI-NRF Centre of Excellence in Catalysis (c*change).

His research focuses primarily on catalysis for energy applications. This includes processes integral to South Africa's synthetic fuels and chemicals industry in the worldwide production of green future fuels and chemicals from sustainable resources.

35 NRF RECOGNISES **UCT RESEARCH LEADERS**

Five UCT researchers are newly acknowledged as leaders in their fields, with prestigious ratings from South Africa's National Research Foundation (NRF).

Supporting its aims to build a "globally competitive science system in South Africa", the NRF's ratings are a valuable tool for benchmarking the country's researchers against the best in the world.

There are five categories of ratings (A, B, C, P and Y) and all are allocated based on a researcher's recent outputs and impact, as perceived by international peer reviewers. In 2021, two UCT researchers have been given A ratings (leading international researchers) and three others earned a P rating (prestigious awards for young researchers who are likely to become future international leaders in their field).

New A-rated researchers

Michael Claeys, professor in the Department of Chemical Engineering, whose research focuses primarily on catalysis for energy applications including the Fischer-Tropsch process. The new rating is also acknowledgement of his role in various catalysis societies, committees and advisory boards.

"My research in catalyst preparation and design has strongly improved, often facilitated by international collaborators."

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"Greater visibility of my work will hopefully generate further interest in Literary Studies research, which compared to the sciences, has sadly been neglected."

Giona Tuccini, professor in the Department of Italian Studies, who specialises in the field of mysticism and religion in Italian literature, medieval/early-modern Italian authors, as well as in Italian prose, cinema and drama of the 20th century.

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New P-rated researchers

Dr Ryan Nefdt, a senior lecturer in UCT"s Department of Philosophy, who also received the 2020/21 Human Sciences Research Council (HSRC) Emerging Researcher Award. Nefdt's research is centred in the broad area of cognitive science. He is the only P-rated researcher in humanities at UCT and one of only two in South Africa.

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Dr Chris Trisos, who directs the Climate Risk Laboratory at the African Climate and Development Initiative (ACDI), was awarded a P rating. His research focuses on climate change risks, building tools to predict where and when these risks appear, and how best to respond to them.

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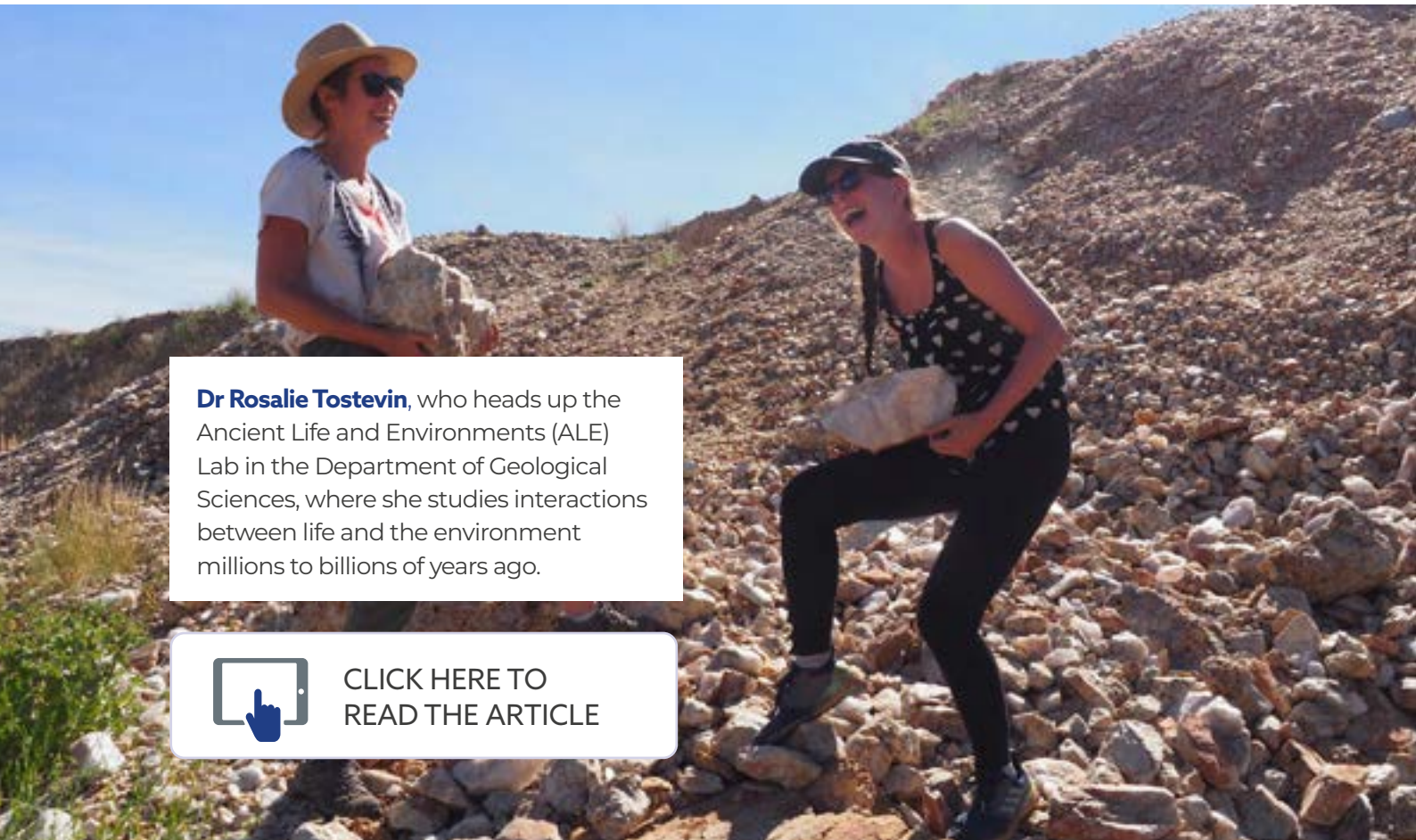
"Growing up in Cape Town with its fynbos and the ocean but also deep inequalities in income inspired an interest in ecology and economics."



Dr Rosalie Tostevin, who heads up the Ancient Life and Environments (ALE) Lab in the Department of Geological Sciences, where she studies interactions between life and the environment millions to billions of years ago.

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36 UCT RESEARCHERS REPRESENT AFRICA IN **GOOGLE'S RESEARCH SCHOLAR PROGRAMME**

Associate Professor Amir Patel and **Dr Mohohlo Tsoeu** from the Faculty of Engineering & the Built Environment are the only African recipients in the 2021 cohort.

Patel and Tsoeu are UCT's first-ever recipients of Google's Research Scholar Programme. Aimed at assisting early-career researchers working on Google-related projects, it offers unrestricted gifts to institutions to fund cutting-edge research in computer science or a related field.

"I believe this award will help me further my goal of moving biomechanics beyond the confines of the laboratory," said Patel.

Patel was awarded in the Machine Perception category for his work on "WildPose: 3D animal biomechanics in the field using multi-sensor data fusion." The project provides greater understanding of the abilities of the world's greatest animal athletes – such as the African cheetah – and offers invaluable insights for the future of legged robots.

Dr. Tsoeu was awarded in the Natural Language Processing category for his project, 'Corpora collection and complete natural language processing of isiXhosa, Sesotho, and South African Sign Language'. His hope is to use the award's considerable resources to develop comprehensive corpora for indigenous South African languages. It will also help inform machine-learning algorithms aimed at automatic speech recognition, translation and text-to speech/sign technology.

"The world is getting extremely connected, both through travel and the web, and the language divide remains a bottleneck to enjoying full global connectedness," Tsoeu said.

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37 UCT LAW PIONEER TO TAKE ON GLOBAL ROLE

The Law and Society Association (LSA) has appointed **Professor Dee Smythe** as its inaugural coordinator of global activities (CGA).

Smythe will head the CGA for the next three years, advising the LSA president and trustees regarding the organisation's global standing. The LSA is an international organisation of scholars interested in the role of law in society, politics, economics and culture.

Called a pioneer in the field of law and society in Africa, Smythe is the director of the Centre for Law and Society. She is also the interim National Research Foundation (NRF) South African Research Chairs Initiative (SARChI) Chair in Security and Justice.

"I'm excited to work with our members to put in place programming and activities that support capacity building and facilitate global collaborations outside of our annual meetings," Smythe said.

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38 WORLD'S OLDEST SCIENTIFIC ACADEMY WELCOMES WILLIAM BOND

An emeritus professor at UCT's Department of Biological Sciences, **William Bond** has been elected a Fellow of the Royal Society.

Bond is the seventh South African to be accorded the honour. He joins the ranks of other icons of science including Charles Darwin, Isaac Newton and Stephen Hawking.

Bond is recognised as a global authority on open (non-forested) ecosystems (e.g. grasslands, savannas, shrublands) and his research into the forces that shape global vegetation, including wildfire, CO_2 levels and herbivores, is credited with transforming our understanding of how these systems emerged.

"Each fellow and foreign member brings their area of scientific expertise to the Royal Society and when combined, this expertise supports the use of science for the benefit of humanity," said Sir Adrian Smith, president of the Royal Society.

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39 UCT PAEDIATRICS RESEARCH EARNS **UK COVID-19 GRANT**

The funding enables a project aimed at better understanding COVID-19 in African children.

The National Institute for Health Research/United Kingdom Research and Innovation Global Effort on COVID-19 (NIHR/UKRI GECO) grant is a collaborative funding opportunity. It has been awarded to an international research project under the leadership of Professor Heather Zar, chair of the Department of Paediatrics and Child Health and the director of the South African Medical Research Council Unit on Child and Adolescent Health at UCT.

In low-middle-income countries , children make up a large proportion of the population. They also face malnutrition, HIV exposure, tuberculosis and prior infection with endemic coronaviruses.

The awarded project aims to investigate this spectrum of illness in African children and identify their risk of infection and development of SARS-CoV-2 infection or severe COVID-19 disease. Zar is collaborating with partners at the universities of Western Australia and Southampton in the United Kingdom.

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40 UNLOCKING UCT **LEADERSHIP IN STEMM**

Associate Professor Gina Ziervogel has been invited to join Homeward Bound, an international leadership programme.

An associate professor in the Department of Environmental and Geographical Science, Ziervogel is a geographer and climate change adaptation expert. She is one of 100 women chosen from across the globe to join the one-year programme.

Homeward Bound is designed to encourage women working in science, technology, engineering, mathematics and medicine (STEMM) to take on more leadership roles. It involves 11 months of collaborative online learning, with a voyage to the Antarctic in the final month.

According to the World Economic Forum, only 30% of global researchers in STEMM are women. In South Africa, Stats SA shows women make up 23% of the STEM workforce.

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41 PROVIDING POWER TO SOUTH AFRICAN COMMUNITIES

Novel research into using renewable energy in off-grid informal settlements in South Africa has won **Dr Jiska de Groot** a Newton Prize.

The £500 000 award is shared between De Groot and her international co-lead Dr Federico Caprotti from the University of Exeter in the United Kingdom (UK).

Titled 'Urban transformation in South Africa through co-designing energy services provision pathways', the project focuses on providing clean, safe and reliable energy to those who live in informal settlements.

Energy poverty is a major challenge in South Africa. Many of the 1.25 million households in informal settlements rely on burning paraffin or wood to cook, and to provide light and warmth at home. Not only do these methods of energy production create health and safety hazards, but they also limit the economic and educational opportunities of the people – most commonly women and children – living in these settlements.

To overcome these challenges, as well as those posed by policy, legal and jurisdictional barriers, the team developed a novel approach to electricity supply in off-grid areas. The solution involves using renewable energy in combination with sustainable, pay-as-you-go business models.

In a video released by the Newton Fund, De Groot said: "Our project is trying to solve the global challenge of access to affordable and clean energy for all. Energy is an enabler of development. The lack of energy doesn't just create health impacts, but also huge inequalities and opportunities for people to develop."

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42 SIX NEW ACADEMICS INDUCTED TO THE UCT COLLEGE OF FELLOWS

The annual awards are among the highest accolades an academic staff member can receive at the university.

Recognising members of permanent academic staff for original and distinguished academic work that merits special recognition, the UCT Council awarded six new fellows into the UCT College of Fellows.

The celebration of the 2020 fellows, held online for the first time, invited the fellows to share personal moments from their academic journeys, crucible moments, their biggest mistakes or biggest surprises. Professor Myer was unable to attend the event.

Council also recognised seven recipients of the College of Fellows Young Researcher Awards:

- **Associate Professor Markus Arnold** (Department of French Language and Literature)
- **Dr Susan Cunningham** (FitzPatrick Institute of African Ornithology)
- **Associate Professor Nico Fischer** (Department of Chemical Engineering)
- **Dr Itumeleng Monageng** (Department of Astronomy)
- **Dr Ryan Nefdt** (Department of Philosophy)
- **Dr Elona Toska** (Centre for Social Science Research)
- **Dr Christopher Trisos** (African Climate and Development Initiative).

Professor Linda-Gail Bekker

Deputy director of the Desmond Tutu HIV Centre at UCT's Institute of Infectious Disease and Molecular Medicine

"The fork in the road offers the option of a planned, well thought-through path, or the way of the heart and of passion. I've been fortunate that I have not ever regretted following the path of passion."

Professor Haroon Bhorat

Director of the Development Policy Research Unit

“The crucible moment came, almost by chance, where I stumbled onto an illegal BBC documentary. The interview I was engaging with was slightly different because it wasn’t a South African activist. Instead, it was a researcher... in fact, he was a UCT economist.”

Professor Johannes Fagan

Head of the Division of Otorhinolaryngology

“It dawned upon me that had I turned out my parachute, which was attached not to me but to the microlight, I would’ve fallen out and freefallen down to earth. I would have most certainly not been here with you tonight, celebrating my election to the College of Fellows.”

Professor Jonathan Blackburn

SARChI Chair in Applied Proteomics and Chemical Biology and based in the Institute of Infectious Disease and Molecular Medicine

“Gone was the pure blue-skies research that I’d carried out as a junior academic. It was replaced by an understanding that unmet biomedical needs of patients and clinicians represent a [powerful] starting point for true translational research.”

Professor Mark Fleishman

Former director of the Centre for Theatre, Dance and Performance Studies and the Department of Drama

“My teacher, Professor Mavis Taylor – literally on her deathbed – leaned over to me and whispered, ‘It’s up to you now.’ What I think she was referring was an injunction to stay in the department at UCT and to continue the process she had initiated of what we would today call transformation”

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Professor Dan Stein

Professor William Bond

Professor Estelle (Vicki) Lambert

43 UCT RESEARCHERS AMONG WORLD'S MOST HIGHLY CITED

Three UCT researchers were named on the Highly Cited Researchers (HCR) list for 2020, with papers frequently cited by their peers over the course of a decade.

Professor Dan Stein from the Department of Psychiatry, **Emeritus Professor William Bond** from the Department of Biological Sciences, and **Professor Estelle (Vicki) Lambert** from the Department of Human Biology were all listed on the HCR.

They earned the accolade for having papers published and cited in one or more of the 21 fields included in Clarivate Analytics' Essential Sciences Indicator (ESI) between 2009 and 2019. Researchers included on the list have published papers that rank in the top 1% of total citations in the world in one or more ESI fields during the survey period.

"It's always deeply gratifying to be recognised for your work in this manner, but it is even more significant that our researchers are being cited as key contributors to knowledge that will drive meaningful projects forward throughout the world," said UCT Deputy Vice-Chancellor for Research and Internationalisation Professor Sue Harrison.

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44 SAMRC RECOGNISES SIX OF UCT'S BEST

Six medical researchers and scientists received honours at the 7th SAMRC Scientific Merit Awards ceremony.

With the awards, the South African Medical Research Council (SAMRC) celebrate the scientific excellence of and contributions by outstanding medical scientists whose work has significantly impacted the lives of South Africans.

The 2021 Platinum Medal, for scientists who have achieved a lifetime of exemplary and outstanding endeavours in the field of health, was awarded to two trailblazing professors: **Linda-Gail Bekker** of the Desmond Tutu HIV Centre and Department of Medicine, and **Heather Zar** of the UCT Lung Institute and Department of Paediatrics.

> "The SAMRC is honoured to celebrate these exceptional South Africans who always go to great lengths to produce world-class science.

Gold Medals were awarded to researchers who made substantial contributions impacting health in the developing world. Among this year's four recipients were: **Professor Graeme Meintjes** of the Wellcome Centre for Infectious Diseases Research in Africa (CIDRI-Africa) and the Department of Medicine, and **Professor Karen Sliwa** of the Hatter Institute for Cardiovascular Research in Africa (HICRA) and the Department of Medicine.

Emerging and upcoming scientists and those committed to capacity development receive Silver Medals. These were awarded to **Dr Claire Hoving** of the AFGrica Unit and the Department of Pathology, and **Professor Mpiko Ntsekhe** from the Department of Medicine.

"The SAMRC is honoured to celebrate these exceptional South Africans who always go to great lengths to produce world-class science aimed at the betterment of the lives of the country's citizens," said SAMRC president and chief executive officer Professor Glenda Gray.

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45 ALAN PIFER AWARDS FOR TWO UCT PROFESSORS

Professors Cathy Ward and **Ambroise Wonkam** recognised for outstanding research with social impact.

The UCT Alan Pifer Award is given annually by the Vice-Chancellor to recognise a UCT researcher's contributions to the advancement and well-being of South Africa's underprivileged communities.

Ward's research in the Department of Psychology focuses on conflict resolution between parents or caregivers and children. Her work has led to the development of Parenting for Lifelong Health, a suite of open access, non-commercialised parenting programmes to prevent violence in low-resource settings.

With programmes for infants, toddlers, young children and teenagers, parenting for Lifelong Health has been endorsed by the World Health Organisation (WHO) and other international organisations.

"This is my small contribution to, hopefully, a democratic South Africa and a world where children can grow up safely," Ward said.

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Wonkam is an award-winning and world-renowned geneticist recognised for his work in sickle cell disease (SCD). He is also director of Genetic Medicine of African Populations (GeneMAP) at the Faculty of Health Sciences (FHS).

The award gives credit to Wonkam's discovery of gene variants that are key for long-term survival in SCD in Africa. It's also a nod to his work describing novel variants in genes relevant to congenital hearing impairment in populations across the continent.

"Due to the modern human originating from the continent, the next frontiers of genetic medicine rest in African genetics variations," said Wonkam.

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46 PRESTIGIOUS LITERARY AWARD FOR UCT SCHOLARS

There are Mechanisms in Place, co-edited by UCT's **Nkule Mabaso** and **Associate Professor Nomusa Makhubu**, won Best Visual Art Collection in the 2021 Humanities and Social Sciences (HSS) Awards.

The book is a collection of creative responses to the Michaelis Galleries exhibition of the same name. The exhibition refers to the South African Minister of Higher Education's comments during 2015's student protests: "A crisis implies that the situation is so bad that there are no mechanisms to deal with it. There are mechanisms in place."

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47 DR KIRSTY CARDEN RECEIVES SENIOR WATER FELLOWSHIP

The Water Institute of South Africa (WISA) Senior Fellow Membership was awarded for contributions made to the water sector.

Carden is interim director of UCT's Future Water Institute (FWI). Her background spans decades of experience, including as an applied scientist in civil engineering and as a pollution control officer at the Department of Water Affairs in 1987. Carden said she was delighted that a "holistic, changing and varied contribution is still recognised".

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48 LEADERSHIP AWARD RECOGNISES UCT'S **REAL ESTATE RESEARCH AND EDUCATION**

The International Real Estate Society's (IRES) 2021 Corporate Leadership Award honours UCT's Department of Construction Economics and Management.

The IRES award recognises international leadership in support of real estate research and education. It also acknowledges the department's support of the African Real Estate Society (AfRES). Associate Professor François Viruly, the director of the Urban Real Estate Research Unit, and Associate Professor Manya Mooya, the head of the Department of Construction Economics and Management, expressed their delight at the news.

"This award reflects the considerable time and effort that colleagues in the department have dedicated to enhancing UCT's position globally, and illustrates the important role the university plays in furthering and supporting research across the continent," said Viruly.

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49 ASSOCIATE PROFESSOR WAHEEDA AMIEN JOINS ADVISORY COMMITTEE ON **MATRIMONIAL PROPERTY LAW**

An academic in the Faculty of Law, **Amien** will join the South African Law Reform Commission's (SALRC) Advisory Committee on the Review of Aspects of Matrimonial Property Law.

Amien's appointment means she will provide assistance, advice and constructive criticism on how to develop matrimonial property law in South Africa. Amien specialises in family law and human rights, with a particular focus on religious and customary family laws, and Muslim family law.

In this role, Amien hopes to apply her expertise in a practical setting and to help improve the socioeconomic circumstances of marginalised spouses, particularly women, in religious marriages. "This appointment is an opportunity to apply my work to effect positive law reform in a significant aspect of marriage laws," Amien said.

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50 ASSOCIATE PROFESSOR DESHEN MOODLEY JOINS INTERNATIONAL **NETWORK ON ARTIFICIAL INTELLIGENCE**

Moodley is one of 19 fellows participating in the University-Based Institutes for Advanced Study (UBIAS) network's fourth Intercontinental Academia (ICA), running until June 2022.

The ICA creates a network of future researchers by bringing together the best young academics from across the globe. They are mentored by eminent researchers in carrying out cross-disciplinary and paradigm-shifting research.

The fourth ICA began as a virtual event in June 2021 and progresses to an in-person event in France and Brazil until June 2022.

Moodley is a member of the recently established Artificial Intelligence Research Unit (AIRU) at UCT, an accredited research unit in the Department of Computer Science. His research focuses on various areas of artificial intelligence (AI) with the aim of solving real-world problems.

His work has played a role in interdisciplinary projects that have contributed to the sensor web, earth observation, biodiversity and digital health research communities.

According to Moodley, joining, participating in and leveraging networks such as the ICA will be crucial for South Africa to keep abreast of and contribute to global innovation and the development of AI technology.

"AI and digital technologies can play a significant role towards building a more fair and just society in South Africa," he said.

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51 UCT JOINS **WELLCOME LEAP GLOBAL NETWORK**

A global group of leading academic and research institutions, the network is committed to solving the world's most serious health challenges at record speed.

Wellcome Leap is a United States non-profit organisation founded by the Wellcome Trust in 2020 to accelerate innovations that benefit global health.

Joining the network means UCT is also a signatory to the first-of-its-kind Master Academic Research Funding Agreement (MARFA). The MARFA helps eliminate barriers to progress including intellectual property ownership and publication.

"UCT looks forward to working with the global research community to unleash truly transformative human health solutions far quicker than has thus far been possible," said Professor Sue Harrison, UCT's Deputy Vice-Chancellor of Research and Internationalisation.

Already this progress is being instigated, with UCT's Dr Virginie Rozot receiving a multi-year contract as part of Wellcome Leap's Delta Tissue (ΔT) programme. A research officer at the South African Tuberculosis Vaccine Initiative (SATVI), Rozot will use the funding to study the human immune system's response to the tuberculosis (TB) bacterium, *Mycobacterium tuberculosis* (*M. tb*).

TB was responsible for 1.4 million deaths worldwide in 2019, according to the World Health Organisation (WHO). Over 450 000 of those were in South Africa. Rozot's work will play an integral part in the design of TB vaccine and immunisation strategies.

"As a female early-career researcher, this is an incredible opportunity to dig into a project for which I have a passion, with a fantastic team at SATVI and a network of South African and international collaborators," she said.

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> "UCT looks forward to working with the global research community to unleash truly transformative human health solutions far quicker than has thus far been possible.

52
UNDERSTANDING **HOW THE BRAIN DEVELOPS**

Wellcome Leap has granted a multi-million-rand contract to Professor Kirsten Donald for research into brain development in early life.

Donald, who is based in the Department of Paediatrics and Child Health in the Faculty of Health Sciences (FHS), will lead a team of scientists from eight universities in investigating the emergence of brain networks underlying executive function. Donald's team will collect data from two sites in Africa: one in Cape Town and one in Blantyre, Malawi. This is the only project at Leap that will add prospectively collected brain imaging to its range of observational methods.

"Ultimately, we want to give children across the world the best chance at flourishing in life," said Donald.

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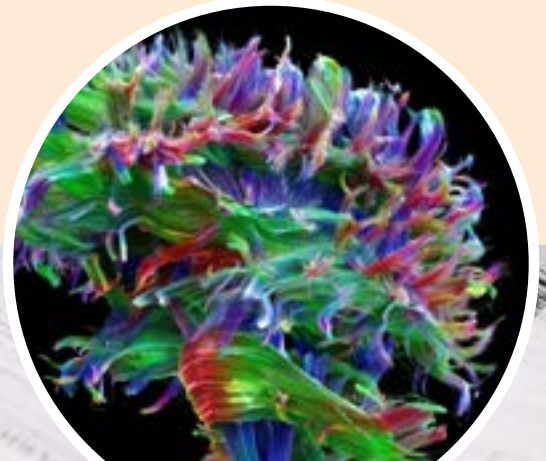

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