

ISSUE 3/2019

umthombo

INCLUSIVE. ENGAGED. AFRICAN.

Spotlight on the Mandela School

Advancing womxn

Making space for more
women's voices in research

International mediation

The role of international relations in
SA's transition to democracy

Shark vs killer whale

Are killer whales eating sharks
in Cape Town's waters?

umthombo

Umthombo is the isiXhosa word for a natural spring of water or fountain. The most notable features of a fountain are its natural occurrence and limitlessness. *Umthombo* as a name positions the University of Cape Town, and this publication in particular, as a non-depletable well of knowledge. In the context of the Cape Town water crisis, *umthombo* represents hope itself.



contents

Research notes	2
World first: bio-bricks from urine	4
Oviraptorosaur: a new species from Mongolia	5
Are sharks being eaten by killer whales in Cape Town’s waters?	6
Spotlight on the Mandela School	8
Spanning the divide between research and practice	10
Championing Africa: Dr Carlos Lopes	12
Making education gains in a messy democracy: lessons from Kenya	14
Youth (un)employment in Africa	15
UCT Mandela School graduates: driving policy change	16
Caring for South African children living below the poverty line	18
The University of Cape Town is advancing womxn	20
Breakthrough in understanding trained immunity	23
What the scientist learned from the cheetah’s tail	24
Spotlight on ARUA	26
Centres of Excellence	28
Strengthening Africa’s climate resilience	30
Advancing Africa’s inequalities agenda	31
UCT is part of two £20-million research hubs	32
New evidence that the work of UN agencies is effective	33
Miracle or mediation: the role of international relations in South Africa’s transition to democracy	34
5 questions with Sheetal Silal	36

RESEARCH NOTES



New timeline for early human evolution

New research from an international team of scientists led by Dr Robyn Pickering, an isotope geochemist at the University of Cape Town (UCT), is the first to provide a timeline for remains from the caves in South Africa's Cradle of Humankind (pictured) – the world's richest site for fossils of our human ancestors.

The research, published in the journal *Nature*, addresses assumptions that the fossil-rich caves of the Cradle could not be related to each other chronologically and proposes that fossils in the region date to just six specific time periods.

"Unlike previous dating work, which often focused on one cave, sometimes even just one chamber of the cave," says Pickering, "we are providing direct ages for eight caves and a model to explain the age of all the fossils from the entire region."

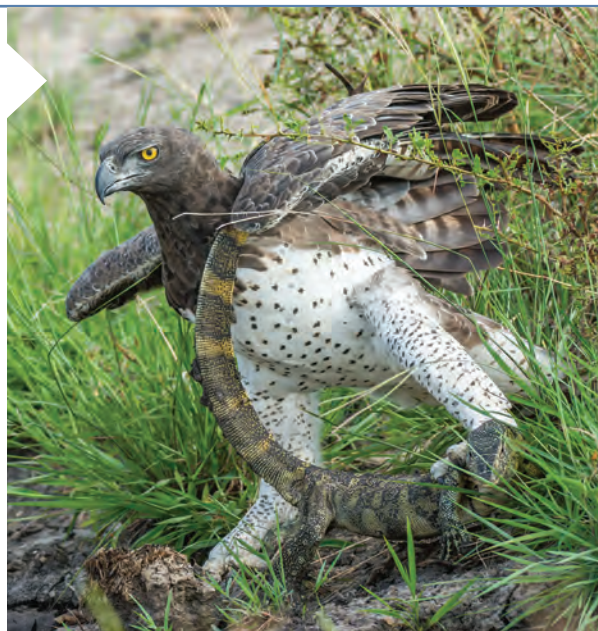
"Now we can link together the findings from separate caves and create a better picture of evolutionary history in southern Africa."

Google Images reveals the diet of Africa's largest eagle

University of Cape Town (UCT) researchers have used Google Images to track the dietary habits of the martial eagle – Africa's largest eagle.

The pictures revealed that reptiles, birds and mammals each make up one-third of the martial eagle's diet. They also showed that the proportions of prey types varied between the different regions, with mammals dominating in eastern Africa and reptiles in southern Africa.

"We've been able to paint a picture of what martial eagles feed on over a huge geographic scale without many of the biases of previous methods," said lead author Vincent Naude, a doctoral student at the Institute for Communities and Wildlife in Africa, in the Department of Biological Sciences. "And we're doing it at a fraction of the time and expense that would be required using traditional methods."



Administering drugs via mobile messaging

Recognising the laborious and time-consuming nature of intravenous drug administration, University of Cape Town (UCT) Associate Professor Sudesh Sivarasu partnered with Dr K Eshwar Chandra Vidya Sagar from Osmania University, India, to develop a device that could automate and streamline the process through activation via mobile messaging.

The device – which can access a database of patient treatment plans – is programmed to send a mobile message to the clinician every time a patient requires drugs. By responding with an activation code, the clinician can instruct a receiver and automated system to communicate with intravenous pumps, which administer the pre-loaded drugs.

"This helps to prevent patients from experiencing unnecessary pain and discomfort while waiting for a clinician to come in to authorise and switch on the button," explains Sivarasu. "It is also far less time-consuming and expensive...."

Are travel conditions changing for Arctic communities?

Inuit communities' travel skills and regional knowledge have helped us understand the effects of climate change on travel conditions in the Arctic, which is warming nearly twice as quickly as the rest of the world. The semi-permanent trails used by indigenous communities on sea-ice, rivers and frozen ground are vulnerable to warming conditions.

The research harnessed interviews with nine Inuit communities in the eastern Canadian Arctic to assess trail viability and compared this to 30 years'

worth of weather records. The results showed that despite changes in climate-related conditions between 1985 and 2016, overall trail access was affected much less than they expected.

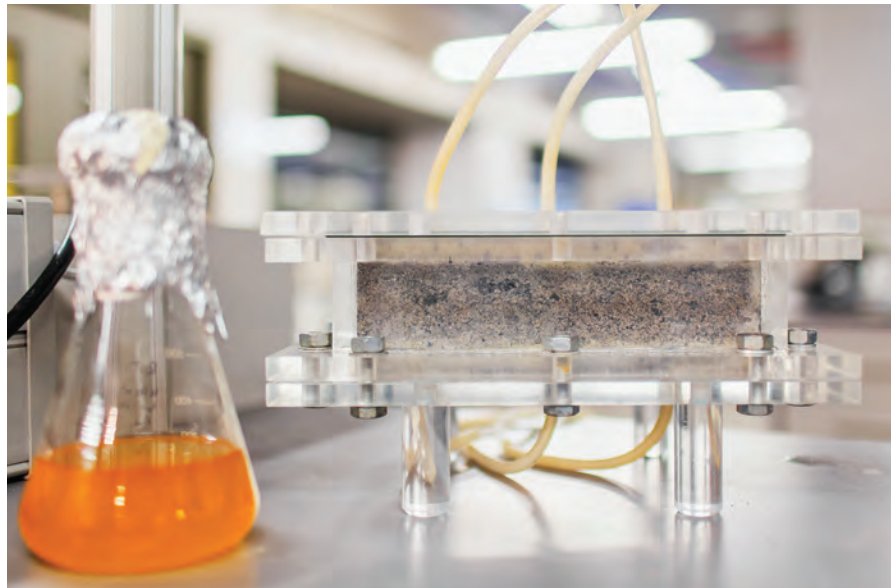
The study, co-authored by University of Cape Town (UCT) Professor Mark New, suggests trail conditions have changed by only about one or two days in the past 30 years and that the combined number of suitable travel days per year for the types of travel examined has actually increased.



PHOTOGRAPHS: CRADLE OF HUMANKIND: MARTIN HEIGAN, FLICKR; EAGLE: RIAAN MARAIS; MEDICAL: RAWPIXEL.COM/PEXELS; DOG SLED: MARKUS TRIENKE

WORLD FIRST: bio-bricks from urine

The world's first bio-brick grown from human urine has been unveiled by University of Cape Town (UCT) master's student in civil engineering Suzanne Lambert, signalling an innovative paradigm shift in waste recovery.



Above: The various stages of the making of the world's first bio-brick created from human urine in a process not unlike the way seashells are formed.

Left: The UCT Department of Civil Engineering's Dr Dyllon Randall and his students, Vukheta Mukhari (middle) and Suzanne Lambert (right).



The bio-bricks are created through a natural process that's not unlike the way seashells are formed, said Lambert's supervisor Dr Dyllon Randall, a UCT senior lecturer in water quality engineering.

In this case, loose sand is colonised with bacteria that produce urease. The urease, an enzyme, breaks down the urea in urine while producing calcium

carbonate through a complex chemical reaction. This cements the sand into any shape, including now – for the first time – a rectangular building brick.

The concept of using urea to grow bricks was tested in the United States but Lambert's brick uses real human urine for the first time, with significant consequences for waste recycling and upcycling.

In addition to producing a bio-brick, the process creates by-products that are important components of commercial fertilisers. Some 97% of the phosphorus present in the urine can be converted into calcium phosphate, the key ingredient in fertilisers that underpins commercial farming. This is significant because the world's natural phosphate reserves are running dry.

Randall said the work is creating paradigm shifts with respect to how society views waste and the upcycling of that waste. "In this example, you take something that is considered a waste and make multiple products from it. You can use the same process for any waste stream. It's about rethinking things."

PHOTOGRAPHS: ROBYN WALKER

Oviraptorosaur: a new species from Mongolia

A new species of dinosaur – a type of oviraptorosaur – has been discovered in Mongolia by a team of researchers from South Korea and their colleagues, including University of Cape Town (UCT) Professor Anusuya Chinsamy-Turan.



An artist's reconstruction of the new dinosaur, *Gobiraptor minutus*.

In this study, the team describes an incomplete skeleton of an oviraptorosaur from the Late Cretaceous – around 100.5 to 66 million years ago – found in the Nemegt Formation of the Gobi Desert of Mongolia in 2008 during the Korea–Mongolia International Dinosaur Expedition.

The unusual, thickened jaws of the new species (*Gobiraptor minutus*) distinguish it from other oviraptorosaurs and indicate that it may have used a crushing feeding strategy. This supports previous suggestions that oviraptorosaurs fed on hard foods, such as eggs, seeds or hard-shelled molluscs.

Chinsamy-Turan, from the UCT Department of Biological Sciences, contributed histological analyses of the skeleton's femur, which revealed that the specimen was likely from a very young individual.

"The microscopic structure of the thigh bone of this Cretaceous-aged, baby dinosaur showed that it was richly inundated with blood vessels and that it was rapidly growing at the time of its death," says Chinsamy-Turan.

The location of the *G. minutus* skeleton in the Nemegt Formation – which consists mostly of river and lake deposits – confirms that oviraptorosaurs were well adapted to wet environments. The research team proposes that different dietary strategies may explain the wide diversity and evolutionary success of this group in the region.

Oviraptorosaurs were a diverse group of bird-like dinosaurs from the Cretaceous of Asia and North America. They are characterised by their short snouts that feature parrot-like beaks, and their commonly feathered hides. The diet and feeding strategies of these toothless dinosaurs are unclear despite the abundance of nearly complete oviraptorosaur skeletons that have been found in southern China and Mongolia.

ILLUSTRATION: DO YOON KIM

ARE SHARKS *being eaten by* KILLER WHALES *in Cape Town's waters?*

DR ALISON KOCK, TAMLYN ENGELBRECHT



Large, predatory sharks occupy the top of ocean food chains, where they play important roles in maintaining diverse and healthy ecosystems. The loss of these predators can therefore have significant impacts on ecosystems.

For a long time, broadnose sevengill sharks have occupied the apex of the food chain alongside the more famous

great white sharks in False Bay on the southern tip of South Africa. Both species feed on seals, dolphins, other sharks and fish.

However, the structure of the False Bay food chain began to change significantly in 2015 with the appearance of a "new" predator: shark-eating killer whales.

The change was noted with the discovery of several dead sevengill

sharks by scuba divers from a popular dive site inside the Table Mountain National Park marine protected area. This site was home to an exceptionally large group of sevengill sharks.

Initially, the cause of death remained a mystery because no dead sharks were recovered for examination. It was only months later following the discovery of more dead sharks and examination of the carcasses by scientists that the

fingers pointed straight at killer whales.

With this information in hand we set about reviewing the literature on killer whale behaviour, dietary specialisation, and population delineation globally and locally. Based on the review we hypothesised that the attacks on broadnose sevengill sharks in False Bay were possibly indicative of the arrival of a different sub-group – or ecotype – of killer whale in the bay that feeds on sharks.

THE APPEARANCE OF A SUPER PREDATOR

Since 2009 there has been a steady increase in the frequency of killer whale sightings and the number of pods in False Bay. Initially, it was believed that the killer whales frequenting False Bay and other areas along the coast predominantly fed on mammals. So, why did killer whales start killing sharks?

Evidence from our literature review points to the arrival of a different killer whale, one which targets sharks. Typically, it used to occur offshore. But that seems to have changed.

At the same time as the first discoveries of the dead sharks, a local whale-watching charter documented the

livers were missing, while the rest of the internal organs were left behind.

There were distinct bite marks on the pectoral fins of the dead sharks. These evenly spaced, circular tooth impressions were identified as most likely being from a "flat-toothed" killer whale, which is rare in coastal waters. There were no bites anywhere else on the body, indicating that the killer whale (or whales) had likely pulled on the pectoral fins to open up the body cavity, to remove the liver. The sharks' liver accounts for up to a third of its weight and is rich in fat, a nutrient that killer whales seek out.



Carcass of a sevengill shark eaten by killer whales at a well-known sevengill shark aggregation site in False Bay, South Africa.

“... the sharks had large, gaping wounds between their pectoral fins and their livers were missing

arrival of two new killer whales in the bay in January 2015. These individuals were easily identifiable and were sighted near the sevengill aggregation site at the time of both incidents in 2015 and 2016.

In 2017, it is suspected that these same two killer whales were also responsible for the death of five great white sharks further up the coast in Gansbaai.

Like the sevengill sharks, the wound pattern was the same and the shark's livers were missing. Examination of the carcasses by scientists showed that the sharks had large, gaping wounds between their pectoral fins and their

CHANGING TIMES

The key questions are why have these shark specialists moved inshore and what impact will they have?

As part of our literature review we looked at a case study from Alaska, United States, that provided some clues.

Killer whales started targeting sea otters and caused massive declines in their abundance. This in turn had a knock-on effect as sea urchin (sea otter food) populations exploded. As sea urchins' primary food is kelp, this increase resulted in the deforestation of kelp forests in the region.

Scientists speculated that the killer

whales started targeting sea otters because of declines in prey species in offshore areas.

This led us to deduce that declines in offshore prey species in South Africa might therefore be one of the reasons these killer whales have moved closer to shore.

Currently, the once popular sevengill aggregation site is largely abandoned, with only rare sightings. Great white shark sightings have also declined in False Bay, possibly in part due to the presence of these killer whales. There are substantial gaps in our understanding of killer whale behavioural ecology in South Africa,

but what's evident is that the presence of these shark specialists could have profound and cascading impacts on the ecosystem. **U**

Dr Alison Kock is an honorary research associate and Tamlyn Engelbrecht is a PhD student in marine biology both at the Institute for Communities and Wildlife in Africa at the University of Cape Town (UCT).

This article first appeared in The Conversation (theconversation.com/africa), a collaboration between editors and academics to provide informed news analysis and commentary.

PHOTOGRAPHS: MAIN: WIKIPEDIA; INSET: MARTIJN SCHOUTEN, CONTENTS PAGE: WIKIPEDIA.

The **NELSON MANDELA** **SCHOOL** *of* **PUBLIC** **GOVERNANCE**

Advancing public leadership in Africa

The Nelson Mandela School of Public Governance at the University of Cape Town honours the legacy of its namesake by providing strategic leadership skills for people who want to make a difference in the world.

As an African institute of practice, the Mandela School invests in young leaders, provides leadership training for established public-sector professionals, offers a space where leaders and policymakers can come together to solve intractable problems, and builds networks of excellence across the continent.

ILLUSTRATION: STUDIO KRONK



Spanning the divide between RESEARCH and PRACTICE

The work of the Nelson Mandela School of Public Governance (previously the Graduate School of Development Policy and Practice) at the University of Cape Town (UCT) is complex, spanning teaching, research and policy engagement. But its aim is simple: put theory into practice to make public service at the highest levels of leadership an aspiration for the most talented of the continent's rising generation.

The central work of the school is to provide strategic leadership skills for people who want to make a difference in the organisations they work in and in the society they live in," explains Professor Alan Hirsch, director of the Mandela School at UCT. Prior to becoming director of the school in 2013, Hirsch worked in the South African presidency where he managed economic policy, represented the presidency at the G20 and was co-chair of the G20 Development Working Group.

According to Hirsch, both the teaching and research aspects of the Mandela School focus on practice. "Our aim is neither theoretical advancement nor teaching theory, and the research work we do is very much at the applied end of the spectrum.

"Our job is to turn knowledgeable public leaders – who may be trained as lawyers, economists or engineers – into what we call effective 'public entrepreneurs,'" says Hirsch, who describes a public entrepreneur as someone who knows how to make good things happen in complex environments.

Professor Brian Levy, academic director of the Mandela School agrees. "The ethos of this school is deeply tied to the approach we bring to development which is: let's wrestle with complexity and let's not get preoccupied with shoulds and judgements," he says.

The Mandela School offers both a master's degree in development policy and practice, and a post-graduate diploma in development policy and practice, which according

to programme manager, Hannah Diaz, offers a suite of tailored short-course offerings that address a range of complex challenges in the public policy and development arena.

"Each course is designed in response to demand and shaped for a specific audience. Sometimes we are commissioned to design a course by a particular government department. Sometimes our chosen subject matter draws participants from more diverse backgrounds," she explains.

All of the courses balance a focus on learning and practical application in participants' contexts with contributions from leading thinkers and practitioners who expose participants to the latest research and innovative practice.

"We've been lucky enough to have the likes of Professor Ravi Kanbur and Professor Trevor Manuel give input on

Opposite: Professor Faizel Ismail (left) is taking over from Professor Alan Hirsch (right) as director of the Mandela School. This page top right: Professor Alan Hirsch and UCT Vice-Chancellor, Professor Mamokgethi Phakeng at the opening of the Nelson Mandela School of Public Governance.

our courses; and to have the strategic advisor at the Ministry of Science and Technology and former national Director General Dr Lindiwe Msengana-Ndlela, and National Planning Commissioner and environmental activist Tasneem Essop facilitate, among others.

"Feedback from our participants always mentions how valuable this grounded input is," explains Diaz.

Africans learning from each other

"At the outset, we called ourselves an African school and wanted to make this real," explains Hirsch. He believes that Africans have a lot to learn from one another. "We believe that building pan-African networks is part of our job," he says. Through the Building Bridges programme, led by Dr Marianne Camerer, over 100 alumni from 10 African countries have already participated in our Emerging African Leaders Programme.

In its first seven years, the Mandela School has drawn participation from

30 African countries. "Our natural market is east and southern Africa, but the school also draws master's students from as far afield as Ghana, Nigeria and South Sudan."

The school also runs a joint programme, LeAD Campus, with two predominantly French-speaking universities. "This means that we can draw people from Francophone Africa, something very rare in South Africa, but greatly appreciated," he says.

The Mandela School is explicit about its aim to build strong continental networks of understanding and action. "We believe this is one of our contributions to the ambitious continental reform agenda," says Hirsch. "Also, it makes the school an exciting place to work in, so we can draw top-quality teaching and programme management staff."

Honouring Mandela through action

When the school re-launched as the Nelson Mandela School of Public Governance in July 2018, Hirsch described Mandela's greatest legacy as the example he set of bold, self-sacrificing yet ethical and accountable leadership.

"Mandela's leadership is a beacon for our times, all over Africa," says Hirsch. "When it comes to the school, our ability to invest in young leaders – as our diverse group of funders enables us to do – creates the kind of legacy I believe Mandela himself would have been delighted by: a living memorial, carried out by young, politically engaged people who are pushing the imagination of what our continent can and should look like." U

CHAMPIONING AFRICA: *Dr Carlos Lopes*

Former executive secretary of the United Nations (UN) Economic Commission for Africa and one of the continent's leading development economists, Dr Carlos Lopes, is now also an honorary professor at the Nelson Mandela School of Public Governance based at the University of Cape Town (UCT). He explains how three mentors set him on course to becoming a staunch pan-Africanist and why he is currently researching African migration.



PHOTOGRAPH: SUPPLIED

When Lopes joined the Mandela School, Professor Alan Hirsch, its director, welcomed him by saying, "Dr Lopes has helped to turn around the negative perceptions of African prospects which have prevailed since the 16th century, while retaining a deep understanding of the challenges which face us."

According to Lopes, this balanced approach of optimistic pan-Africanism qualified with clear-eyed pragmatism is born of his choice to be both a scholar and a civil servant. Choices, he says, he may never have made if it wasn't for the three mentors who shaped his life and thinking.

A firebrand father and a pan-Africanist intellectual

Lopes was born in Canchungo, a small town in north-western Guinea Bissau. "It is a beautiful place: a small town that we called a city," he says. "This is where I grew up and it was not far from here where my father was imprisoned for his role in the liberation struggle."

Lopes was inspired by his father's idealism. "He was really my first role model. I wanted to be like him. I was a 13-year-old when Guinea Bissau became independent and I soon found myself swept up in the politics of the time."

Lopes finished his secondary schooling early and by the time he was 17 years old he was working as an aide to a man who was to change his life: Mário de Andrade, the first President of the Angolan MPLA, who had become a dissident, living in Bissau at the time.

"I wanted to go to university but by that time there were no universities in my country for me to attend. Instead Mário became my university.

"He taught me how to do research, how to be precise in my thinking and writing and how to pay attention to

the intricacies of language. Really he taught me the curiosity and discipline of the intellectual.

"Thanks to Mário making me read so widely about Africa, I had already at that time a continental perspective. I was a pan-Africanist without even realising it"

“I am excited to be able to engage with what I consider to be an essential part of the development future for the continent.”

Eventually, thanks to Andrade's network, Lopes won a fellowship to study abroad, first economics in Geneva and later at Paris-Sorbonne University where he completed a PhD in history.

"I went from living in one of the world's poorest countries to living in one of the richest and it was a shock," Lopes remembers. "I recall walking down a street and seeing a watch in the window of a shop which cost far more than the annual budget of my entire family."

A rock star of diplomacy

After completing his studies, he returned to Guinea Bissau where he founded a research institute that focused on sociological and economic research in the region. Once he became disillusioned with the political instability in Guinea Bissau it was time to move. He was approached by the UN Development Programme to become a consultant.

"At first, I travelled around Africa doing research, but by age 28, I found myself working as an economist at the United Nations headquarters in New York."

Eight years later, Lopes was appointed the UN resident coordinator to Zimbabwe. By 40, he was assistant secretary-general; 12 years later, he

became under-secretary-general. "I led a great many institutions during my time at the United Nations, but to my mind my most rewarding role and another piece of good fortune was to work as political director to Kofi Annan, who was my mentor and also my friend."

Lopes describes his time working

with Annan as akin to returning to university. "He was a remarkable man. His level of tact and diplomacy, his ability to arouse empathy and his keen emotional intelligence was astounding," explains Lopes. "If I had learned a continental perspective from Mário de Andrade, from Kofi Annan I learned to see on a global scale."

African emigration today

Lopes' recent work with Professor Alan Hirsch on the role of narratives in Africa and the research he completed for his newest book, *Africa in Transformation: Economic Development in the Age of Doubt*, has led him to his current research focus on the place of African migration in narratives about the continent.

"There are a number of phenomena that will increase mobility and provoke emigration from Africa in the near future, such as mass urbanisation and youthful populations. If we don't correct perspectives about African migration, it will only aggravate the misunderstandings," he says.

"I am excited to be able to engage with what I consider to be an essential part of the development future for the continent, and to do it from a school such as the Mandela School which is truly inclusive and pan-African." **U**

Making education gains in a messy democracy: lessons from Kenya

Kenya's budget for education is only one-fifth of South Africa's and yet the country consistently out-performs South Africa on important education outcomes. Professor Brian Levy, academic director at the Nelson Mandela School of Public Governance at the University of Cape Town (UCT), explains why this is the case and what it tells us about how to make progress in a 'messy democracy'.

A tale of two provinces

"Politics is messy," says Levy, "often, so is bureaucracy."

Levy, who worked for the World Bank for 23 years and is now academic director at the Mandela School and professor of international development at Johns Hopkins University, is explaining why a narrowly technocratic approach to development is often not very useful.

"There is a prevailing narrative that basically goes: figure out the right thing to do and then assume a perfect government in which politicians will understand and implement the policy perfectly," he says. "But the world is not like that."

In a recent book, *The Politics and Governance of Basic Education: a tale of two South African provinces*, for which he was lead editor and co-author, Levy explores the differences between provincial and national educational systems as a lens through which to consider the strengths

and weaknesses of different kinds of 'messy democracies' and their ability to achieve development goals. Levy categorises these different political systems according to a typology he developed previously, which characterises political contexts according to whether they are personal or impersonal, hierarchical or fragmented.

According to him, the education systems in the Western Cape and Eastern Cape provinces of South Africa are emblematic of this typology. "The Western Cape is a classic example of an impersonal, hierarchical environment. The Eastern Cape on the other hand is personalised and fragmented."

"As you might assume, having a stronger bureaucracy does translate into stronger results. The Western Cape emerges as a strong performer relative to other South African provinces. However, econometric analysis confirms that – notwithstanding strong bureaucracy and abundant resources – its outcomes were below those achieved in Kenya."

South Africa vs Kenya

"If we zoom out to the continental level and contrast the Kenyan and South Africa education systems, we discover that – politically and bureaucratically – Kenya is far more like the Eastern Cape than the Western Cape in that it is highly personal and very fragmented," explains Levy.

Kenya, as a country with a significantly smaller gross domestic product (GDP) than South Africa, also spends far less on education. According to Levy, Kenya has only one-fifth of the fiscal resources of the Western Cape.

"The remarkable feature, however, is that even after you control for a wide variety of variables, the Kenyan system still far outperforms the Western Cape and South Africa as a whole."

What accounts for this disparity?

According to Levy, the answer lies in civic engagement. "Jomo Kenyatta, Kenya's first president after independence, championed the idea of 'harambee' or self-help, as a means to achieve development goals. From the outset, education was lauded as one of the most important of these goals."

To illustrate how deeply this ethos runs in Kenyan society, Levy mentions an observation from Kenyan educational specialist Dr Benjamin Piper. In Piper's words, "In rural Kenya, there is an expectation for kids to learn and be able to have basic skills ... Exam results are far more readily available than in other countries in the region. The 'mean

scores' for the Kenya Certificate of Primary Education and its equivalent at secondary school are posted in every school and over time so that trends can be seen. Head teachers are held accountable; paraded around the community if they did well, or literally banned from school and kicked out if they did badly."


Making gains in a messy democracy

How can this be applied to other contexts beyond education and what implications does it have when working towards development goals within politically messy contexts?

Levy has two central suggestions, which he describes as an islands-of-effectiveness approach combined with working towards the evocation of agency.

"My work, and those of participants in the Mandela School master's programme, have explored the potential of islands of effectiveness as narrowly-focused initiatives that combine high-quality institutional arrangements at the micro-level, plus supportive, narrowly-targeted policy reforms," says Levy. "The strength of an 'islands' approach is that the whole system does not have to be working perfectly to still get results."

The aim, according to Levy, is to engage multiple stakeholders at all levels of a system in a way that cultivates a sense that their actions can lead to change and better results.

"This is something worth working towards," says Levy. "We must harness it if we are to create more inclusive economic growth, not just in education and not just in South Africa, but across the globe." 

YOUTH (UN)EMPLOYMENT IN AFRICA


The Building Bridges Programme at the Nelson Mandela School of Public Governance at the University of Cape Town (UCT) hosted a research roundtable last year on the theme of "Addressing youth (un)employment and livelihoods in Africa". The two-day round table brought together emerging thought-leaders from all over the continent along with representatives from the United Nations Regional Office for East and Southern Africa, the Raymond Ackerman Academy at UCT and Research ICT Africa.

"The roundtable was born of the recognition of the importance of livelihoods and inequality in the future of African youth as well as a platform in which graduates of our Emerging African Leaders Programme (EALP) could make their voices and research heard," explains Mabel Sithole, a UCT doctoral student in political science and the Building Bridges programme officer at the Mandela School. "We wanted to create a space where alumni and experts in the field could discuss and learn from each other."

The roundtable invited written submissions around five key themes that sought to address such questions as what is the role of the informal sector in creating work opportunities, how can we narrow the gap between policy and implementation, and what impact will the fourth industrial

revolution have on youth employment in Africa.

Over the two days, key themes emerged. "The roundtable highlighted the recognition that youth leadership can help to bridge the policy-implementation gap, that the informal sector plays an enormous role alleviating poverty and that the role of the private sector is critical," says Sithole. "The roundtable also explored the impact of the fourth industrial revolution in relation to African youth and observed the importance of protecting freedom of speech on the continent at a time when democracy in Africa is arguably shrinking."

Faith Kiboro, a 2018 Mandela School research fellow and one of the roundtable organisers, found the discussion about the future of work in Africa particularly relevant. "It was so refreshing to find a group of young Africans willing to take on such a daunting and big issue," she says. 



UCT Mandela School graduates: DRIVING POLICY CHANGE

Africa is the world's youngest and fastest growing continent. 60% of its 1.2 billion people are below the age of 25. By 2050, Africa's population is projected to double to around 2.4 billion people - larger than China and India combined. The Nelson Mandela School of Public Governance's master's degree in Development Policy and Practice at the University of Cape Town (UCT) is ensuring that the next generation of Africa's policymakers have the skills they need to lead, influence and make decisions crucial to good governance on the continent.

The Mandela School's MPhil in Development Policy and Practice develops potential in strategic public leadership and offers a structured and sustained learning opportunity – at the cutting edge of global knowledge and experience. Participants undertake applied research in public policy design and implementation. The goal is to equip graduates with the skills to enhance their capabilities as strategic leaders in the public sector, civil society and international organisations.



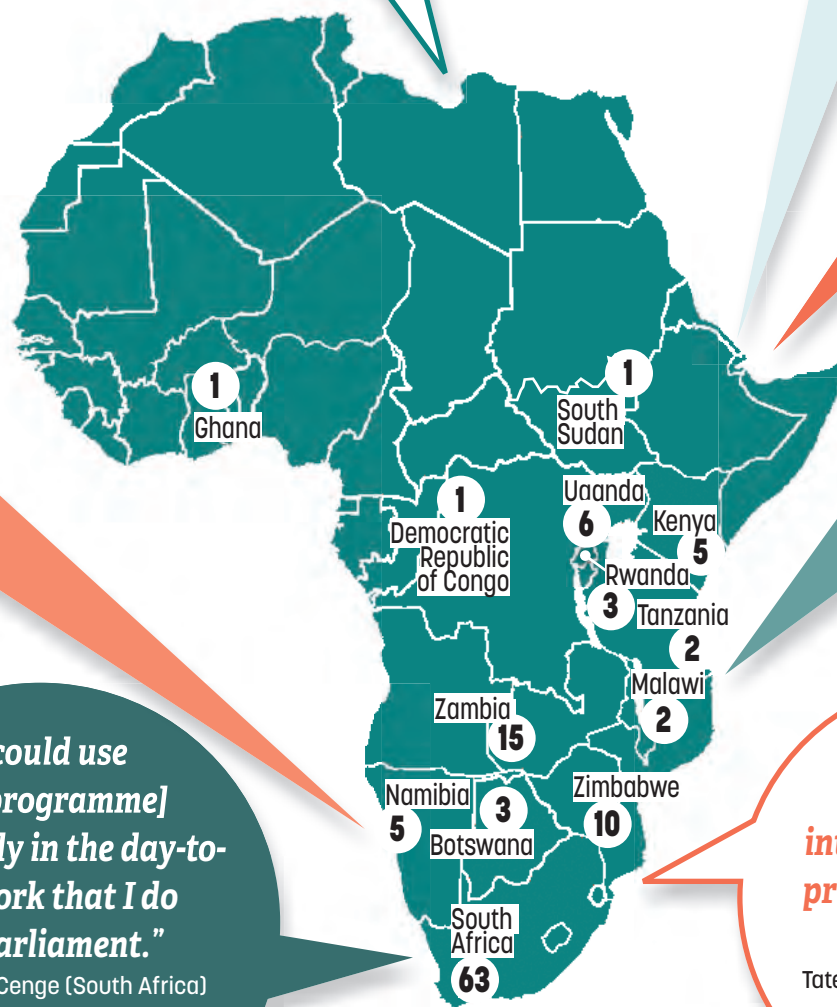
"What this programme really does is provide practical tools."
Chris Nkwatsibwe (Uganda)
Resource person, Uganda National NGO Forum



"It's almost a transformative process that forces you to see things that you've never seen before."
Pamla Gopaul (South Africa)
Policy and governance officer and coordinator, NEPAD



"I could use [the programme] practically in the day-to-day work that I do for parliament."
Ntandokazi Cenge (South Africa)
Content advisor: standing committee on public accounts, South African Parliament



MPhil students and alumni come from across Africa

"The programme has enabled me to work on multi-faceted policy issues. The experience of the tutors who are also practitioners is very valuable because I'm drawing on their experiences as well."

Grace Wandera (Kenya)
Acting director, strategy and marketing, Kenya Vision 2030 Delivery Secretariat



"[The programme] gives an explanation and the reasoning behind each and every big policy decision that's been tested or considered for implementation."
Michelle Ntukanyagwe (Rwanda)
Senior policy analyst, Office of the President

"In all my years of learning, I haven't found an education institution that is so sensitive, so alive and so responsive."
Ringisai Chikohomero (Zimbabwe)
Development advisor, independent



"...it's helped me navigate the interface between the private sector and the public sector."
Tatenda Mzezewa (South Africa)
Development economist, Urban-Econ



SOME FIGURES FROM THE MANDELA SCHOOL'S PROGRAMMES*

>1 300
graduates since inception in 2014

96%
say their chosen course was "extremely or largely" helpful in their career

99%
continue to use course principles in their everyday policy work

93%
say their course gave them an extremely valuable professional network in Africa

96%
have since been able to implement significant policy or attitude change at their places of work, with 50% saying this shift was "major" or "highly significant"

* MPhil in development policy and practice, and the Executive Education and Building Bridges programmes



Caring for South African children living below the poverty line

Six million children live below the food poverty line according to a report by the Children's Institute (CI) at the University of Cape Town (UCT) that looks into the situation of 8.3 million of South Africa's households with children. The state must take more responsibility in assisting parents to provide adequate care for children, it contends.

Story adapted from one written by Nkateko Mabasa and published in the Daily Maverick.

A central question in the 13th South African Child Gauge 2018 report was how to achieve good collaboration between families and the state so that children can develop well and no child is left behind. According to the report, 41% of the 8.3 million households with children in South Africa are headed by a single parent, mostly mothers, living with an average per capita monthly income of ZAR870 (about USD60).

The report was compiled by the CI in partnership with the Department of Science and Technology and the National Research Foundation's Centre of Excellence in Human Development at the University of the Witwatersrand, UNICEF South Africa and the Standard Bank Tutuwa Community Foundation. To gauge children's living conditions, the report looked at the interface of families and the state, and the double challenge of families failing to nourish children in ways that the state requires and the state not fulfilling

“While parents, guardians and caregivers bear the primary responsibility for providing for children and realising their rights, the state is the ultimate duty-bearer.

its obligation to provide an enabling environment.

According to the report, the state must focus on building capacity and provide “quality response services to families” to couple the growing access to services in post-apartheid South Africa. And although the state recognises the “multi-generational nature of many families”, different departments have different views of what makes up a family and whose responsibility it is to care for the children, said Katharine Hall, senior researcher at the Children's Institute and lead editor of the 2018 issue.

The state must recognise the various strategies families adopt to care for children and create programmes and policies that cater to families as they are, the report insists. It found that 32% of the households in South Africa are extended and the single-person household is increasing as more adults migrate to cities in search of work. Only 25% of children live in traditional nuclear families. And because family members are highly mobile, the structure and strategies which families employ to maintain homes change over time, as parents are often away from children to seek work and provide for the household.

With the nuclear family as a frame of reference for policymakers, the state “will continue to ignore the lived experiences of care of many South African children”, said the report. And although the Child Support grant – which reaches 12 million children every month – is designed to follow the child, when care arrangement changes it is difficult to provide the grant as the administrative systems

struggle to keep up with changing arrangements. According to the report, policies and services need to be sufficiently flexible to accommodate and make allowances for the “dynamic nature of family structures and living arrangements”. Recent legislation has expanded the Children's Act to ensure the responsibility to “provide for the realisation of children's rights” not only falls on parents and families but on the state as well.

“While parents, guardians and caregivers bear the primary responsibility for providing for children and realising their rights, the state is the ultimate duty-bearer,” says the report. The report further shows how the state has not met this responsibility, noting that in some instances “it has been taken to courts to ensure that it meets its obligation”.


The Constitution gives legal force to both statutory and customary law, which makes it more difficult to provide adequate care for children because of having to navigate changing cultural norms in pursuit of children's best interests. With many areas of family life regulated by customary law, children are often not given individual entitlement outside of the welfare of the family, creating a tension between the two legal systems.


“Western systems of law emphasise the individual and the nuclear family, while customary law tends to prioritise a child's development under the protection of its patrilineal or matrilineal family,” said UCT Associate Professor Elena Moore. As a result, family disputes become difficult to resolve because of an “imbalance of power relations” between adults and children. ^U

SOUTH AFRICA'S CHILDREN

 **8.3 MILLION**
households with children in South Africa

 **6 MILLION**
children live below the food poverty line

41% 
of households with children are headed by a single parent with an average monthly income of ZAR870 (about USD60)

 **77%**
of children living in single-parented and extended households depend entirely on social grants

58,000
children lived in households where all the members were under 18 years old in 2017



The University of Cape Town (UCT) is making strides in the advancement of women by awarding grants totalling ZAR22.5 million (about USD1.6 million) to women researchers over the next five years under the banner of Advancing womxn: a call for change. UCT Vice-Chancellor Professor Mamokgethi Phakeng hopes the awards will make space for more women's voices to be heard – for their own advancement and for the advancement of others.

Advancing womxn with five major awards

Dr Katie Altieri, Professor Floretta Boonzaier and Professor Janet Hapgood will receive funding of ZAR1 million per year for five years. Additionally, Professor Patricia Kooyman and Dr Robyn Pickering are recipients of meritorious awards to the value of ZAR750 000 per year for five years. The winners will not only be conducting leading-edge research in fields where women are under-represented and into women's issues but will also be advancing the next generation of women researchers.

Three of the winners – Altieri, Kooyman and Pickering – were successful in the category "For womxn by womxn: conducting research in a field in which womxn are in short supply"; Boonzaier and Hapgood – were chosen in the category "For womxn by womxn on womxn: conducting research in an area of study that focuses on womxn". Capacity building, with a particular emphasis on diversity, was an important criterion for both categories.

Phakeng has publicly committed herself and UCT to creating more opportunities for women, and she is stepping up to the plate by offering this substantial funding to advance women at UCT, in South Africa and globally.



DR KATIE ALTIERI: Enabling South Africa's black oceanographers



PROFESSOR FLORETTA BOONZAIER: Unsettling research on gendered and sexual violence



PROFESSOR JANET HAPGOOD: Informed choices for women's contraception

Along with three co-investigators, Altieri from the Department of Oceanography aims to enable a cohort of postgraduate black women and transgender oceanographers to become leaders of oceanography in South Africa – and the global south.

The project will develop a research and leadership training programme at UCT for black women and nonconforming genders, who remain disproportionately under-represented in scientific research in South Africa, and particularly in oceanographic research. The programme will recruit, retain and enable black female or trans postgraduates to achieve sustained excellence in oceanographic research with a focus on identifying future leaders for the national and international arena.

Despite countless efforts to address gendered and sexual violence in South Africa, it continues to persist, risking the lives and well-being of women, girls and non-conforming genders across the country. Through her project, Boonzaier – from the Department of Psychology – aims to shift the ways of thinking about and doing research on gender-based violence.

She asks, what does it mean to think differently about research on gender-based violence?

The work aims to impact not only the ways we teach approaches to research, but also the ways we think about the purpose of research itself and the benefits that might be derived from it.

Women in sub-Saharan Africa are at high risk of being infected with HIV. They also need access to effective, safe and affordable contraception. However, the hormonal contraceptive that's most widely used in the region – depo-medroxyprogesterone acetate or Depo-Provera – may increase the risk of HIV infection by about 40%.

Hapgood will investigate the molecular mechanisms behind this potential increased risk for women. She and her team will take the results they have already gained in the laboratory and understand them in the context of clinical samples.

The results will give insight into the best choice of hormonal contraception for women, with the goal of improved health for women and informing public health policy.

ILLUSTRATION: SHUTTERSTOCK. PHOTOGRAPHS: ALTIERI: UCT; BOONZAIER: ROBYN WALKER; HAPGOOD: UCT.



“Research into human evolution in South Africa has been substantial and has received international attention for nearly 100 years. However, the leading researchers in South Africa have always been men.

PROFESSOR PATRICIA KOOYMAN: Building fuel cells, better

Hydrogen gas can be used in fuel cells to generate electricity independently and on a small scale. However, if there is any trace of carbon monoxide in the hydrogen gas of a fuel cell, it can hamper power generation.

Kooyman will explore ways to remove carbon monoxide from hydrogen gas with the goal of improving methods for preparing fuel for fuel cells. Providing cheap, easy-to-use and -maintain, stand-alone fuel cells may contribute to the economic empowerment of people who are socially disadvantaged.

As part of her project, Kooyman will train a cohort of black female or trans postgraduate researchers in critical skills in chemical engineering, catalysis research and transmission electron microscopy – areas in which men still dominate.

DR ROBYN PICKERING: Growing the next great palaeoanthropologist

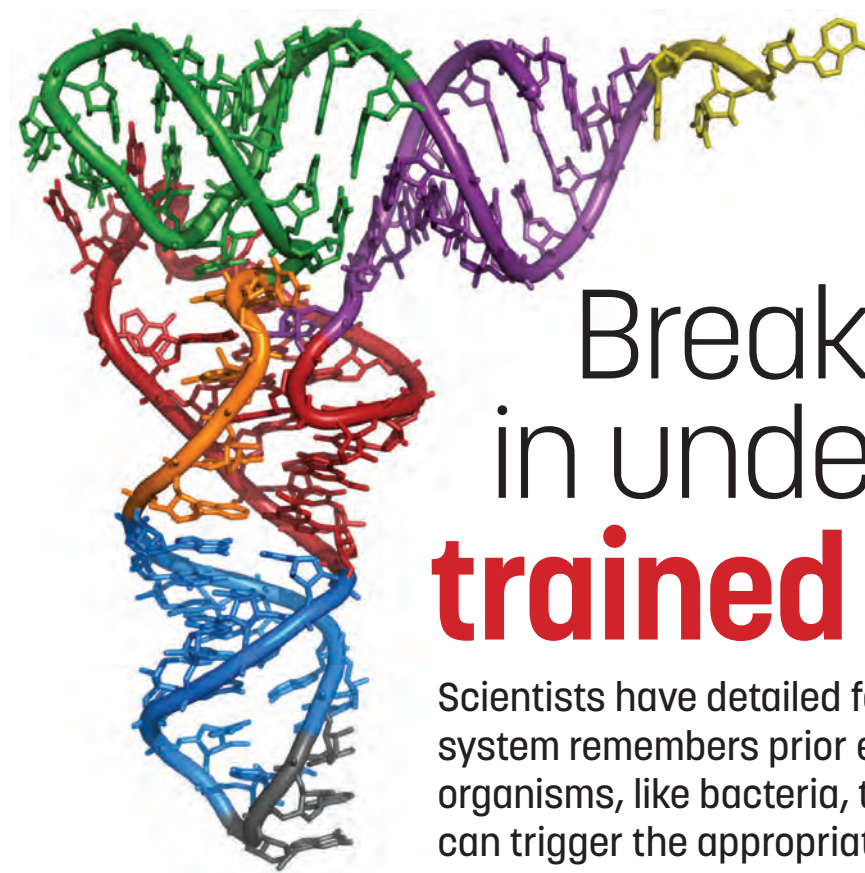
South Africa has a rich record of human evolution, spanning fossils of our early ancestors through to more recent evidence for the emergence of modern humans and their complex behaviours. Research into human evolution in South Africa has been substantial and has received international attention for nearly 100 years. However, the leading researchers in South Africa have always been men.

Pickering and her co-investigators want to take the first step towards transforming the field of paleoanthropology. They plan to build up the Human Evolution Research Institute (HERI) at UCT to make it a world-class and enabling research environment where excellence shines and the next generation of great South African black female or trans palaeoanthropologists will grow. ^U

PHOTOGRAPH: JE'NINE MAY



The awards were launched on National Women's Day at an event hosted by Vice-Chancellor Prof Mamokgethi Phakeng (right). Guests of honour were Chancellor Graça Machel (middle) and former VC, Dr Mamphela Ramphele.



Left: biological molecules, called long non-coding RNAs, regulate the acquisition of memory by immune genes during trained immune responses.

Breakthrough in understanding trained immunity

Scientists have detailed for the first time how the immune system remembers prior exposures to pathogens – micro-organisms, like bacteria, that cause infection – so that it can trigger the appropriate response to reinfection.

Within the human immune system are two important actors: the innate and adaptive immune systems. The main cells involved in the adaptive – or acquired – immune system are B and T lymphocytes, which retain a memory of prior exposures to pathogens, infections and diseases. This memory can be ‘written’ to lymphoid cells by vaccines, for example, allowing the system to respond more quickly and strongly to re-exposure.

The innate immune system, made up of myeloid cells, monocytes and macrophages, had until recently been thought not to possess this sort of memory.

A team of scientists from the University of Cape Town (UCT), the Institute for Infectious Disease and Molecular Medicine based at UCT's Faculty of Health Sciences, and the Council for Scientific and Industrial Research, led by UCT Professor Musa Mhlanga, has explained the mechanism of trained immunity in the innate immune system – for the first time. Their findings were published in *Nature Genetics*.

The scientists – with international collaborators from China, Germany, Italy, Singapore and the United States – demonstrated that a recently discovered group of biological molecules, called long non-coding RNAs (lncRNA), regulate the acquisition of memory by immune genes during trained immune responses.

Mhlanga and his colleagues characterised an example

Our study provides the first mechanistic explanation for how trained immunity works and exposes it to highly targeted intervention in immunomodulation, one of the largest therapeutic areas in the pharmaceutical industry.

of one lncRNA called UMLILO – aptly named after the Zulu word for ‘fire’ – which controls how immune genes that regulate inflammatory responses implicated in several major diseases retain a memory of prior exposures.

“Our study provides the first mechanistic explanation for how trained immunity works and exposes it to highly targeted intervention in immunomodulation, one of the largest therapeutic areas in the pharmaceutical industry,” explains Mhlanga.

“Broadly, it contributes to our fundamental understanding of immunology and gene regulation in general by indicating how gene expression can be influenced and maintain a persistent and heritable memory of environmental exposures.

“This memory can be ‘written’ and ‘erased’ continuously via environmental exposures over the lifetime of an individual.” ^U

ILLUSTRATION: YIKRAZUUL/WIKI COMMONS



What the
scientist learned
from the

cheetah's tail

Dr Amir Patel, a senior lecturer from the University of Cape Town's (UCT) Department of Electrical Engineering, first started investigating the properties of cheetahs' tails in relation to robotics. Little did he know that his research would result in a whole new way of capturing the movement of the human body.

Dr Amir Patel first became interested in tails after he chose to build robots designed to move at high speeds as part of his PhD studies at UCT. "At the time, I was fascinated with the notion of bio-inspiration – or learning lessons from animals evolved over millions of years and then applying those to new technologies," says Patel.

"There were studies at the time that showed how lizards stabilised their movement when they jump using their tails. I started to wonder: if lizards used this technique, then what about an animal closer to home that moves much faster, the cheetah?"

Patel started to research the subject, but quickly found that there was not much scientific literature about it. To understand more, he decided to do his own research.

"I used three methods," he explains. "First, I built simplified tails for two robots, Dima and Dima II ('lehadima' is Sesotho for 'lightning strike'). This showed the affect of a tail on agility by replicating the movement of a cheetah's tail."

"Second, I developed some mathematical models that showed by computer simulation that tails stabilise movement. And third, I was fortunate to be invited to the autopsy of a cheetah, which allowed me to make some very precise measurements. That, surprisingly, had not really been done before."

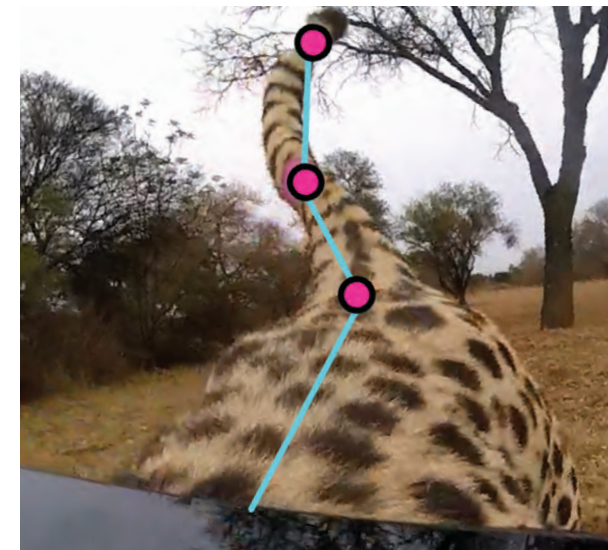
It turned out that the cheetah's tail, while bushy-looking, is actually extremely light. "It was thought that a cheetah's tail accounted for up to 10% of its body weight. But in fact, it is less than 2%," explains Patel.

Patel became interested in the aerodynamic effects of cheetahs' tails. He took some cheetah tails from the specimen collection at the National Zoological Gardens of South Africa in

Pretoria and he stuck them in a wind tunnel at UCT. Patel determined that a cheetah's tail creates significant aerodynamic drag as a means to redirect the animal's movement in a stable way.

FROM AERODYNAMICS TO ALGORITHMS

The last piece of the puzzle fell into place when Patel spent time studying cheetahs at wildlife sanctuaries near Cape Town and Johannesburg. He created a special harness with a camera facing backwards that could be comfortably attached to the animals' backs.



"It was thought that a cheetah's tail accounted for up to 10% of its body weight. But in fact, it is less than 2%."

Using smartphone technology, such as accelerometers, GPS and gyroscopes, Patel was able capture a great deal of information in a short amount of time.

"This resulted in some big datasets, but of course they were meaningless unless we had a way of processing them," says Patel. Once again, he relied on his own resourcefulness to write an algorithm that combined these disparate kinds of information and resulted in a coherent model of the skeletal movement of a cheetah, including its spine and tail.

A NEW WAY TO CAPTURE HUMAN MOVEMENT

"While discussing our invention with Saberi Marais of UCT's Research Contracts and Innovation (RC&I), we realised that this way of capturing movement could also be applied to the human body," says Patel.

Marais introduced Patel to scientists at the UCT Sports Science Institute who were keen to collaborate on the project. "Up until now, if a sports scientist wanted to study the movement of an athlete, for example, they would have had to do it on-site, in a custom setting, using motion-capture cameras," explains Patel. This is often expensive and impractical.

With seed funding from RC&I, Patel and his team began to adapt their cheetah sensors to make them suitable for use on humans.

"In essence, we have created a system of multiple sensors that are lightweight and economical, but can capture the movement of the body very precisely.

"Using a dozen such sensors attached to different parts of the body, I believe we can capture a very complex and nuanced picture of its movement – and we can do it remotely," says Patel.

Patent protection has been sought for this invention, which promises to have a wide array

of applications from sports scientists analysing the movement of professional athletes to doctors gauging the effects of a stroke on a patient's movement.

Did Patel have any inkling that what started as a means to stabilise robots would result in a revolutionary means to track human movement?

"I had no idea," says Patel. "But, I think, if you're willing to continue to ask questions, willing to learn from nature and collaborate in a multi-disciplinary manner, your curiosity can be rewarded in all sorts of unexpected ways." **U**

Strength through collaboration

The African Research Universities Alliance (ARUA) is a network of universities from various African countries and historical backgrounds, but with a common vision. It represents a response to the continent's need for capable and engaged research universities working to solve the region's development challenges.

Africa's history and the history of its universities has led to muted interest and investment in research: African research accounts for only around 1% of the world's output. Because of this context, ARUA's approach has been different to that of other regional university networks: it brings together peer African institutions to collaborate and pool their limited resources with a view to creating a critical mass to more effectively support their growing numbers of researchers.

ARUA's strength lies in the fact that several top-level universities on the continent have agreed to work together in a manner and on a scale not seen before.

AMONG ARUA'S STRATEGIC OBJECTIVES ARE TO:

- increase Africa's contribution to global research output
- increase the number of African universities in the top 200 globally
- contribute to cultivating good quality PhD graduates for other African universities
- become an effective advocate for funding research in Africa by national governments and international agencies.

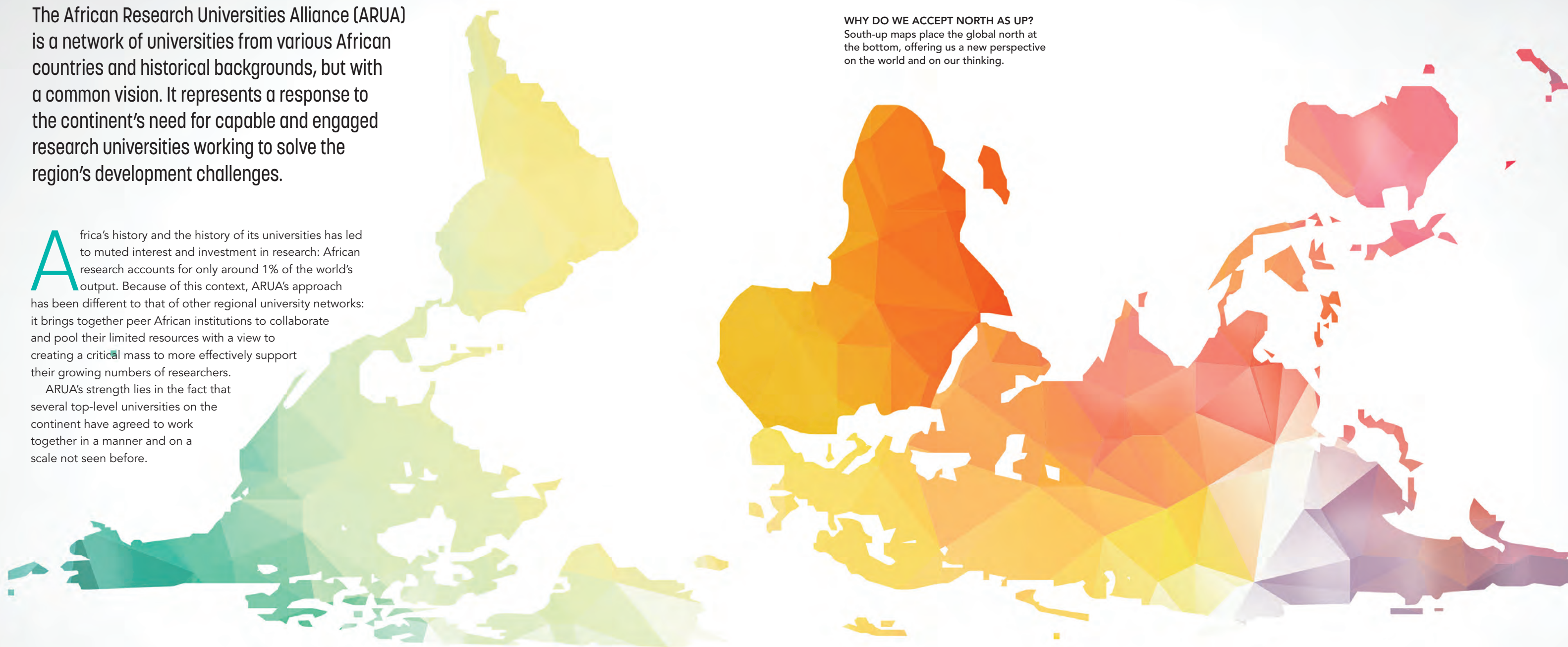
CARNEGIE BENCHMARKING PROJECT

To track ARUA's progress and evaluate its success, 13 of the ARUA universities held a meeting to establish a baseline of the research intensity of each of the alliance members and an aggregated picture of the collective at the start of 2018. The Support of Carnegie Corporation of New York for this benchmarking exercise is gratefully acknowledged.

ILLUSTRATION: SHUTTERSTOCK

WHY DO WE ACCEPT NORTH AS UP?

South-up maps place the global north at the bottom, offering us a new perspective on the world and on our thinking.

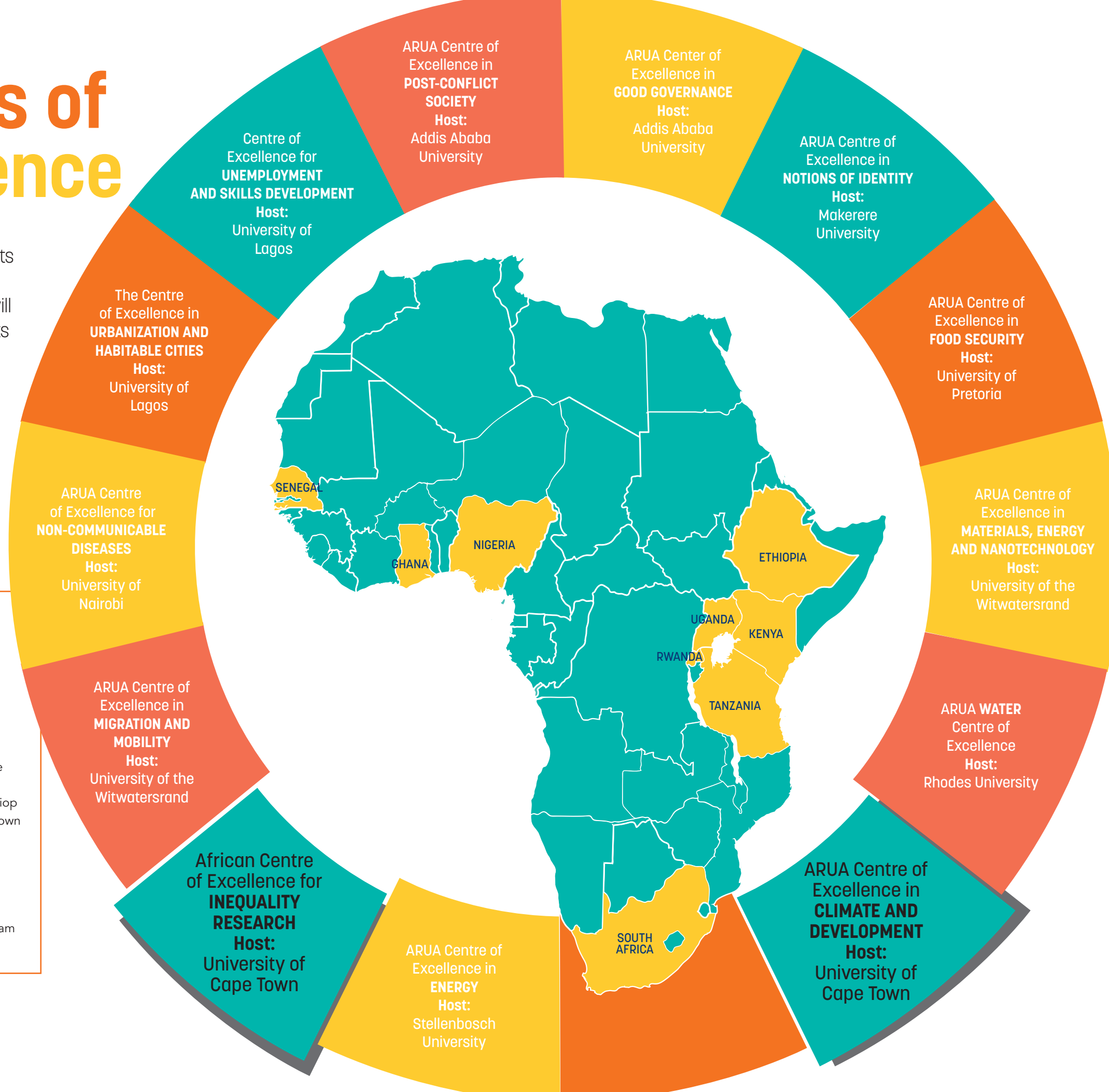


Centres of Excellence

ARUA Centres of Excellence are intended to be focal points for collaboration between member universities. They will operate as assembly points for excellent and committed researchers conducting collaborative research in priority thematic areas while also providing opportunities for students to contribute and get involved.

MEMBER UNIVERSITIES

Ethiopia: Addis Ababa University
Ghana: University of Ghana
Kenya: University of Nairobi
Nigeria: University of Lagos
 University of Ibadan
 Obafemi Awolowo University Ile-Ife
Rwanda: University of Rwanda
Senegal: University Cheikh Anta Diop
South Africa: University of Cape Town
 University of Kwa-Zulu Natal
 University of Pretoria
 Rhodes University
 Stellenbosch University
 University of the Witwatersrand
Tanzania: University of Dar es Salaam
Uganda: Makerere University



ARUA operates Centres of Excellence in the 13 priority thematic areas it has adopted, ranging from food security to post-conflict society. The centres seek to conduct cutting-edge research that is innovative and has the potential to transform.

The benefit of the Centres of Excellence approach is that it provides an opportunity for stronger universities in the network to augment the capacity of other universities to obtain the resources needed for their growth and development. Collaborative effort is much more likely to lead to stronger research proposals.



Strengthening Africa's climate resilience

The African Research Universities Alliance (ARUA) **Centre of Excellence in Climate and Development (ARUA-CD)**, hosted by the University of Cape Town (UCT), is set to strengthen Africa's voice in climate-change discussions following a significant funding allocation from the Worldwide Universities Network (WUN).

UCT's African Climate and Development Initiative (ACDI), which holds the ARUA-CD secretariat, was awarded GBP10 000 (ZAR181 700) to help support research on climate-resilient landscapes, specifically at three study sites in South Africa, Kenya and Ghana.

The ARUA-CD's work will not only strengthen Africa's voice in climate negotiations, but also enhance delivery on its climate and development agenda, said Professor Sheona Shackleton, ACDI deputy director.

"We aim to improve the quality and quantity of African research, and its impact on decision-making. This is African-led science, for African application," she said.

As host to the ARUA-CD, UCT is playing a fundamental role in building the essential indigenous research capacity to see Africans become climate-resilient.

Reflecting the location of each university, the ARUA-CD consists of three nodes, located across the continent (in southern, eastern and western Africa). The aim is to avoid duplication of research efforts, creating a critical mass of scientists working together to undertake comparative research.

The ARUA-CD's WUN research will draw together scientists from different disciplines and institutions, including experts on livelihoods and adaptation; environmental history; ecosystem services; hydrology; biodiversity; agriculture; climate risk; and water, energy and food security. **U**

“We aim to improve the quality and quantity of African research, and its impact on decision-making. This is African-led science, for African application.”

PHOTOGRAPH: SHUTTERSTOCK

Advancing Africa's inequalities agenda

The University of Cape Town (UCT) has launched the **African Centre of Excellence for Inequality Research (ACEIR)**, under the banner of the African Research Universities Alliance (ARUA). ACEIR is one of 13 ARUA centres, each addressing a research theme aligned to the United Nation's Sustainable Development Goals (SDGs).

This centre of excellence seeks to consolidate and magnify the efforts of African universities as they relate to poverty and inequalities research, with a mind to informing policy and advancing civil society action.

Although housed at UCT, under the direction of Professor Murray Leibbrandt, the centre will be made up of three nodes across the African continent. This lateral organisation reflects the way the centre plans to work: as partners seeking to advance the African perspective on inequality.

UCT will host the southern African node. The two other local hubs will be situated at the University of Ghana and the University of Nairobi.

"Our main objective is to improve on the quality and quantity of African research and enhance the voice of Africans in global debates," explained Professor Ernest Aryeetey, secretary-general of ARUA.

Inequality has emerged as perhaps the most important social science issue of this decade, Leibbrandt explained. Within this context, southern Africa has emerged as one of the most unequal

“If we want to be taken seriously as the African voice, then we've got to insert ourselves.”

regions globally.

"If we want to be taken seriously as the African voice, then we've got to insert ourselves." **U**

PHOTOGRAPH: SHUTTERSTOCK



University of Cape Town is part of two £20-million research hubs

Researchers from the University of Cape Town (UCT) are included in two of 12 international teams selected by United Kingdom Research and Innovation (UKRI) to establish large interdisciplinary research hubs based at leading UK universities that address the world's complex development challenges. The research hubs are funded through the Global Challenges Research Fund (GCRF), which has allocated nearly GBP200-million to the initiative – the largest single investment by UKRI. GCRF was set up by the UK government to support research that tackles the challenges faced by developing countries.

Accelerating Achievement for Africa's Adolescents Hub

Led by an interdisciplinary team at Oxford University and UCT, this hub aims to discover which combinations of services can most efficiently and cost-effectively help adolescents achieve their potential.

By testing different combinations of interventions – such as parenting programmes, business skills and violence prevention – the hub will identify 'accelerator synergy' service combinations to boost nutrition, health, schooling, employment,

gender equality and safety for teenagers across Africa. The goal is to provide policy-makers with the evidence they need to choose programmes that work and are cost-effective and scalable.

Professor Lucie Cluver, a principal investigator at Oxford University and honorary professor at UCT's Department of Psychiatry and Mental Health, is one of three directors of the hub. UCT academics Professor Cathy Ward from the Department of Psychology and Dr Elona Toska from the Department of Sociology are also involved.

One Ocean Hub

The UKRI GCRF One Ocean Hub, led by the University of Strathclyde, aims to transform our response to the multiple, urgent challenges that threaten the health of the world's ocean and its contributions to human well-being.

Whereas current solutions are disconnected across sectors and levels, and from those people most affected by ocean degradation, the One Ocean Hub aims to unify them.

By bringing together more than 50 partners, the hub seeks to bridge disconnections in law, science and policy and

to integrate governance frameworks to balance multiple ocean uses with conservation. It will investigate how to share fairly and equitably the environmental, socio-cultural and economic benefits of ocean conservation and sustainable use.

Five UCT researchers will be co-investigators on the hub: Dr Lynne Shannon (biological science), Dr Tobias Schonwetter (commercial law), and Dr Philile Mbatha, Associate Professor Merle Sowman and Associate Professor Rachel Wynberg (environmental & geographical science). **U**



New evidence that the work of UN agencies is **EFFECTIVE**

Collaborative research involving University of Cape Town (UCT) researchers shows how key services in lower- and middle-income countries can contribute to reaching multiple United Nations Sustainable Development Goals (SDG), even among high-risk children and adolescents.

The study – led by Oxford University in collaboration with UCT, the University of the Witwatersrand, University College London and the United Nations Development Programme – is the first to test the United Nations' concept of 'accelerators': provisions that can improve the lives of vulnerable populations in not only one SDG area, but many. It finds clear evidence for these, even amongst an exceptionally high-risk group: adolescents living with

HIV in South Africa. The study goes further to find that simple combinations of accelerators – such as parenting support, cash transfers and safe schools – result in an even greater impact.

"This new evidence is a step forward in reaching the Sustainable Development Goals," says Professor Lucie Cluver, a principal investigator at Oxford University and honorary professor at UCT's Department of Psychiatry and Mental Health, who led the study. "Even for one of Africa's most vulnerable groups – adolescents living with HIV and AIDS – the right combinations of programmes can help."

"By providing social welfare grants, safe schools and supportive parenting for these highest risk teens, we can make substantial positive impacts across health, education, gender equality and

violence prevention."

This paper is the first from a new series of Global Challenges Research Fund (GCRF) Hubs: a major investment by the United Kingdom (UK) government that was launched earlier this year (see opposite). The research is at the core of the work of the Accelerating Achievement for Africa's Adolescents Hub, a partnership between African and UK universities, and international agencies such as the United Nations Development Programme, the World Health Organization and UNICEF (United Nations International Children's Emergency Fund).

"We are really looking forward to extending this analysis conceptually and methodologically to the Hub's work led by our team at UCT," says Dr Elona Toska, a lead investigator of the study and UCT lead academic for the Accelerating Achievement for Africa's Adolescents Hub.

"Leading social scientists will work closely with a cohort of early career researchers at UCT and partner institutions to capitalise on existing datasets by exploring new possible accelerators and accelerator synergies across a dozen African countries." **U**

ILLUSTRATION: JANNOON028/FREEPIK

PHOTOGRAPH: SHUTTERSTOCK

Miracle or mediation:

the role of international relations in South Africa's transition to democracy

A new book by UCT political scientist Dr Zwelethu Jolobe challenges the idea that South Africa's transition to democracy was solely homegrown.



In his new book, *International Mediation in the South African Transition*, Dr Zwelethu Jolobe argues that the role of international mediation in South Africa's transition to democracy has been downplayed and undervalued. "There is a strong thread of exceptionalism that runs through the narrative of South Africa's transition to democracy," says Jolobe. "It is often described as a homegrown miracle, but in fact, the international community – particularly the Commonwealth and the United Nations – played a profound and beneficial role in the political transition to end apartheid."

Jolobe, a senior lecturer in political science at the University of Cape Town (UCT), first became interested in the subject during his PhD research. "At the time, I was looking at the pre-negotiation that occurred in the period before the end of apartheid, and I realised there was a pattern of downplaying the role of international, third-party mediation."

PHOTOGRAPH: MICHAEL HAMMOND

A prophetic architecture

In his book, published by Routledge, Jolobe compares mediation attempts by the Commonwealth and United Nations.

"Between 1945 and 1962, many former British colonies and Commonwealth members became independent states, including Pakistan, India, Nigeria and Kenya," explains Jolobe.

"There was thus a huge amount of pressure for Rhodesia and South Africa to reform. When South Africa re-applied to join the Commonwealth after becoming a republic in 1962, Commonwealth members agreed on condition that apartheid was dismantled. Of course, the South African nationalist state refused."

According to Jolobe, from this time onwards, the Commonwealth – including many newly independent states – supported the anti-apartheid movement. In 1985, the Commonwealth formed the first Eminent Persons Group to investigate and encourage negotiations towards ending apartheid.

"Most people think of the Commonwealth's attempts to end apartheid at this time as a failure since PW Botha – the president then – and the African National Congress (ANC; South Africa's current governing political party) rejected the Commonwealth proposal. In fact, if you look at the formula the Commonwealth mediators presented, it contains all the elements that would later form the basis of negotiation during the secret talks that happened in the United Kingdom in 1987," says Jolobe.

"If you look at the most important point of agreement between the two sides that led to the unbanning of the ANC in 1990, many of them can be seen first in the Commonwealth's earlier attempts at negotiation. In that sense, the Commonwealth's effort at mediation was prophetic."

“South Africa is not exceptional. In fact, it is dangerous to explain our history as miraculous.

Breaking a deadlock

The United Nations' (UN) role in mediation came later. "The UN declared apartheid a crime against humanity in 1973," explains Jolobe. "So, by the early '90s, relations between the United Nations and South Africa had been adversarial for a long time."

In 1992, the historic record of understanding pushed the ANC and nationalist governments towards a settlement. At the same time, an escalation in violence made many South Africans believe that civil war was imminent.

"At this point, negotiations broke down, and it took Western powers to come together and say, 'We have gone too far down the line, let's find a way around this'," explains Jolobe.

"It was the Spanish Prime Minister who came to South Africa at the time. Later the British Prime Minister involved the Americans. They lobbied the then UN Secretary General to arrange a meeting in Lagos attended by leaders of both sides. From there, the UN Security Council held an extraordinary meeting attended by a huge array of people, from religious figures to academics to politicians and leaders of anti-apartheid organisations."

This led to the creation of the United Nations Observer Mission to South Africa. "It's clear that without this mediation there was a very real risk of negotiations breaking down entirely," says Jolobe.


An appetite for peace

"Often people measure the success of mediation only in terms of a conflict ending or parties getting back to the negotiating table," says Jolobe. "But if we examine the attempts of the Commonwealth and United Nations in South Africa, we will invariably shift how we measure successful mediation."

In Jolobe's opinion, there is a lot of value in third-party intervention, not only in resolving conflict but also, more generally, as a way to create equity in a world that lacks a central authority.

"Wars happen because people can't see solutions from within the conflict. Outside mediators play an important role in these situations as can be seen from the role of the Commonwealth and United Nations in South Africa's transition. Their attempts were not constant and not always successful in the short term, yet they played an essential role in agenda-setting and keeping negotiations from breaking down."

"South Africa is not exceptional. In fact, it is dangerous to explain our history as miraculous. Our transition to democracy was due to the hard work and commitment of many local and international figures."

"This is important because it underscores the role of international mediation. If such efforts are valued and understood to be replicable there is a greater chance of peacefully resolving current and future conflicts around the world." 



5

QUESTIONS WITH Sheetal Silal

Dr Sheetal Silal, a senior lecturer in the Department of Statistical Sciences at the University of Cape Town (UCT), uses mathematical modelling to fight infectious diseases. She heads up the Modelling and Simulation Hub, Africa (MASHA), and is an honorary visiting research fellow in tropical disease modelling at the Nuffield Department of Medicine, Oxford University.

1 How can mathematics help us tackle disease?

It's like Galileo said, "Mathematics is the language in which God has written the universe." We can use maths to portray how a disease behaves, examine how we can intervene to manage it and even learn new things about its epidemiology.

2 How can modelling inform policy?

Think of a mathematical model as a video game – like Minecraft or SimCity – where you build a virtual reality of how a disease might spread. If you can do that, then you can answer questions like, 'What can government do to contain the disease?', 'How much will it cost?' and 'How many people should be vaccinated before the whole population is protected?'

3 What's been your most surprising research finding to date?

In exploring the impact of human migration on malaria elimination in South Africa, my models showed that it was possible to eliminate malaria in South Africa only if malaria incidence was dramatically lower.


Through an international collaboration, we modelled and costed

this reduction in Mozambique and put forward a proposal to South Africa's National Treasury. In the 2019 budget speech, Finance Minister Tito Mboweni allocated ZAR319 million towards malaria elimination in South Africa.

4 Does Africa need more mathematical modellers?

In my travels throughout our continent, I have found that we have very talented mathematicians and mathematics students. This talent needs to be harnessed and channelled through funding and research projects to support our governments to control the diseases that continue to devastate our people. It has been my long-held belief that Africans can solve Africa's problems.

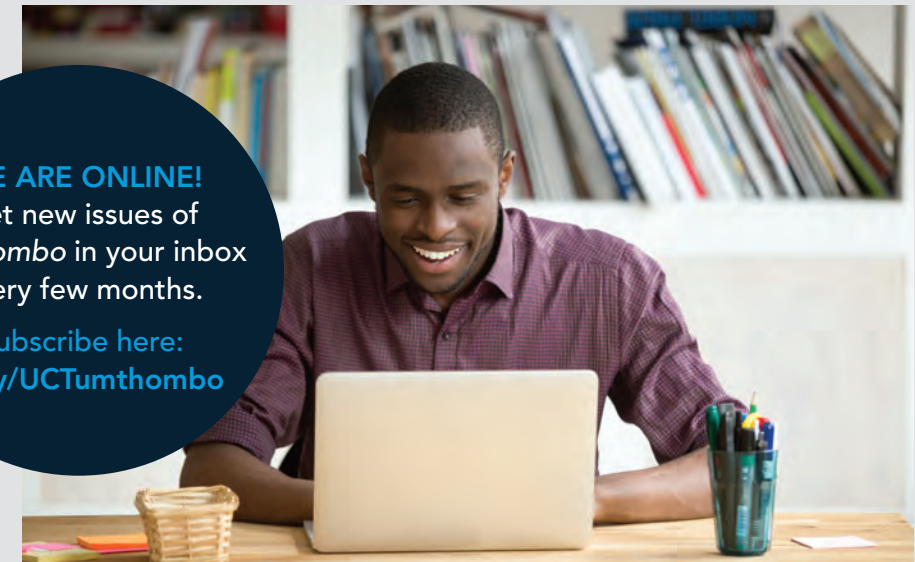
5 What inspires you?

I have been researching disease modelling for more than 10 years. What inspires me to remain in this field is that this research can make a difference to people's lives. Science is growing every day. Twenty years ago, this kind of modelling was practically impossible. But today, scientific and technological advancement has allowed mathematical modelling to become an invaluable tool in shaping health policy and saving lives. It's the impossible made possible through science. 

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