



RHODES EXCHANGE

Bringing you news about research, progress and development

*ISSUE 007 / JULY 2014



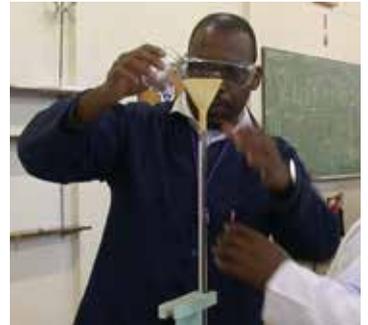
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FAREWELL TO BADAT

It was with a measure of real sadness that as a University we said our goodbyes at the end of June to our Vice Chancellor. Dr Badat has been instrumental in positioning the University as world-class African University with a compelling focus on its research and postgraduate endeavors. Establishing the Sandisa Imbewu fund, he encouraged and supported many researchers to mobilise their ideas and he will look back with great satisfaction at the key indicators that are the real measure of a fine University. These include our undergraduate and postgraduate throughput rates being amongst the highest in the country, close to 8% of NRF funded research chairs for a University with less than 0.8% of South Africa's students, and a University with amongst the highest per capita research outputs of any South African University.

None of this would have been achieved though if it were not for the support from the donor community. His understanding of the complexities of the Higher Education environment and his ability to inspire support in key areas is well documented and his legacy will include a substantially larger campus than when he arrived with greater focus on its niche areas. He leaves Rhodes as a vibrant 'going-concern' with a clear understanding of its purpose and place and we wish him well in his move to the United States where he will continue to play a key role in the higher education environment of this country. Working with the Mellon Foundation, he will oversee and direct the Foundation's international grantmaking and the ongoing programs in South Africa. We wish you well Dr Badat.



THE STRENGTH OF OUR YOUTH

While Mr Vuyo Kahla, Chair of the Rhodes University Council, and his board take on the not inconsiderable task of appointing a new Vice-Chancellor, Rhodes has appointed Dr Sizwe Mabizela, the Deputy Vice-Chancellor: Academic and Student Affairs, to the task of Acting Vice-Chancellor for the interim. "Dr Badat has been an outstanding leader; a very humble person but one whose principles of social justice, human rights and human dignity were beyond question," said Dr Mabizela. "He believed there was greater educational value in ensuring our student population was diverse in terms of social and economic class composition. He has remained true to that commitment and the University must remain deeply grateful for that." With a firm belief in the strength of our youth to help South Africa realise its potential, Dr Mabizela himself is outspoken about the role of education in redressing the imbalances of our past. He believes citizens have an important role to play in encouraging and supporting our educators and calls for a deeper compassion and empathy for the challenges South Africans face today.



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GREAT ESCARPMENT BIODIVERSITY

The Great Escarpment stretches southward from Angola in the northwest through Namibia, and curves through South Africa, Lesotho and Swaziland back north to the Zimbabwe-Mozambique border. "These mountain ranges are almost completely unknown botanically and yet our entire economy depends on their catchment areas for the country's water resources," said Professor Nigel Barker of the Botany Department.

The Great Escarpment Biodiversity Programme was started by Barker eight years ago. Plant collections, animal studies and birdlife monitoring have begun to paint a picture of an ecosystem comprising montane islands in a sea of radically transformed lowlands.

"The mountains are our last frontier of biodiversity and as such it is important to model the effects of climate change. We hope to ultimately assess the biodiversity of the whole Escarpment, and examine the notion that it has served as a montane pathway along which species historically may have migrated both northward and southward. As a fundamental part of this, we extensively collect

specimens to represent the biota and study the more interesting species in closer detail, including their population genetics," said Barker. "I want to use the region as a laboratory to train students in biodiversity science, especially in the context of anthropogenic climate change. Additionally, a huge amount of awareness needs to be generated about the region and the significance of its conservation".

Barker and his team have undertaken studies in the Eastern and Southern Cape mountains, Lesotho and the Lubango in Angola, and have plans to also conduct research in the Chimanimani and other mountains in Zimbabwe. He has collaborated with Mark Robertson in Pretoria, Bill Branch at Bayworld, Afromont, which is run out of the secretariat at Pretoria, the Global Mountain Biodiversity Assessment Group based in Switzerland, Diversitas, which is now Future Earth, SAIAB, the Albany Museum and various other connections in Lesotho, Zimbabwe, Angola, the UK and Switzerland.

The NRF has funded the project for much of its life, while Rhodes University, National Geographic,

SANBI and NORAD have also provided crucial financial assistance. However, with so many mountains to climb, additional funding is always being sought.





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PLANT RESPONSES TO CLIMATE CHANGE

Research into the responses of important southern African crops, alien invasive plants and indigenous plants to changing climates, originating chiefly from increasing human activity causing environmental pollution, is crucial to answering questions related to land conservation and food security, which of course have important socio-economic consequences.

However, the vast majority of empirical data describing plant response to climate change comes from the northern hemisphere and thus does not allow accurate predictions to be made for the southern hemisphere. "Vegetation in the northern hemisphere is limited by low temperature and incident light, while in the southern hemisphere water availability and high temperature are the factors that limit vegetation," said Professor Brad Ripley, an ecophysiologicalist in the Botany Department. "Both of these factors interact directly with increasing atmospheric CO₂ concentrations with potentially dramatic consequences for vegetation. Understanding CO₂ thresholds is essential for our future predictions of responses of land cover change, crop security and feedback response between vegetation and climate."

Ripley's involvement with The Land Cover Change Consortium, a national group of scientists who have met regularly to identify priorities and concerns about the impact of climate change on earth atmosphere interactions, has led to the development of an elevated CO₂ research facility at Rhodes University and exciting collaborations with researchers at Rhodes, the University of Illinois, the University of Sheffield, The Smithsonian Institute and national institutions including the universities of Cape Town, Stellenbosch, KwaZulu-Natal, SAEON, the ARC and the CSIR.

Working with one of his main collaborators, Professor Martin Hill, who is the Head of Entomology at Rhodes, they have received funding for the project from Sandisa Imbewu, the NRF National Equipment Fund, the DST Global Change Grand Challenges Research Plan, Working for Water and the Applied Centre for Climate and Earth Systems Science (Access)

"We plan to research the response of South African varieties of maize to severe drought as is experienced by much of the subsistence farming practice in southern Africa," said Ripley. "This offers the opportunity to investigate some fundamental science questions about C₄ plant response to drought but aims to inform crop models of important interactions of drought and elevated CO₂ which would make annual predictions of maize crop yields more robust. Other experiments are planned to investigate the role of atmospheric CO₂ concentration in driving bush encroachment and determining the effects of future climates on biological control efficacy."



ECOSYSTEM DYNAMICS OF SOUTH AFRICAN TEMPERATE MANGROVE FORESTS

Globally mangrove forests are expanding their distributional ranges due to climate change. Intertidal salt marsh and mangroves occupy similar estuarine habitats, with salt marsh replacing mangroves in colder, more temperate zones. As temperature increases and sea level rise accelerates, mangroves are able to establish in new areas, replacing existing vegetation such as salt marsh as documented in the United States of America and New Zealand.

Botany lecturer Dr Anusha Rajkaran's research monitors the spread of mangroves in South Africa and establishes the changes in the physical environment brought about by mangroves. "We also maintain a long term dataset of growth rates of three mangrove species, this dataset was established in 2005 and is the only one of its kind in the country," she explained. "It gives an indication of how fast mangroves grow in different areas. Using this data we were able to show that mangrove harvesting in South Africa is unsustainable due to the slow growth rate.

Providing data for future management strategies, Rajkaran's research aims to further understand this unique habitat and hopes to expand in future to include insects and the macro fauna such as crabs living in this ecosystem.



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ECOSYSTEM DYNAMICS OF SOUTH AFRICAN TEMPERATE MANGROVE FORESTS (continued from page 3)

“We also aim to re-evaluate the distribution of mangroves in South Africa. Mangrove forests provide many ecosystem services upon which rural communities remain heavily reliant,” she said. “The management and preservation of these systems are therefore important to ensure their existence.”

Collaborating with a number of national and international collaborators, Rajkaran and her group of postgraduate students also form part of the Western Indian Ocean Mangrove Network which comprises of researchers from all the countries between South Africa and Kenya as well as the Islands in the western Indian Ocean. “The network allows for sharing of information, sampling practices and skills and plays a major role in capacity building within this region,” she said. In this regard her postgrad students are encouraged to attend conferences and workshops.

Rajkaran’s main sources of funding for this work include the NRF Thuthuka grant and Rhodes University. “The Thuthuka grant aims to promote the research development of early-career academics employed at South African universities, science councils and museums,” she said. Having received her PhD in 2011 and taking up her post in October of the same year, Rajkaran applied for Thuthuka funding and with the equal contributions of Rhodes University as her host institution she was able to start her first three-year project in 2012.

“Without this funding my research capacity would have been severely limited,” she explained. “Ms Chanel Geldenhuys, my MSc student, had been granted a bursary from the Research Office at Rhodes before the Thuthuka funding was approved. It was great to start my first year in Academia with a MSc student and that has provided momentum for these past few years.”

Ms Geldenhuys has since graduated as have a number of Honours students.



DR ANUSHA RAJKARAN AS YOU WILL USUALLY FIND HER, ON THE WATER IN AN ESTUARY.



DR GEORGINA CUNDILL, KARABO CHADZINGWA AND NOKUTHULA DUBAZANE (BOTH MASTERS STUDENTS), AND JESSICA COCKBURN, A PHD STUDENT, TRAVELLED TO FRANCE RECENTLY TO ATTEND THE RESILIENCE2014 CONFERENCE ([HTTP://WWW.RESILIENCE2014.ORG](http://www.resilience2014.org)).

COLLABORATIVE ENVIRONMENTAL GOVERNANCE

“Ecosystems are the earth’s life support system. In an era of unprecedented social and ecological change from local to global levels, effective decision making at all scales is a primary challenge,” said Dr Georgina Cundill, a senior lecturer in the Department of Environmental Science. “In South Africa, we face some particular challenges in redressing historical injustice in meaningful ways while simultaneously meeting international targets for biological conservation. We currently have 150 protected areas under claim by surrounding communities in South Africa, most of which will become co-managed reserves in the next five to 10 years. Learning how to nurture collaboration in these contexts is a pressing challenge for environmental governance in the country right now.”

Establishing herself as a specialist in the area of collaborative environmental governance, through her research Cundill aims to “work with communities and state agencies to find context specific ways of achieving human well-being and ecosystem conservation simultaneously.”

She is the co-lead with Dr Michael School of Arizona State University of a newly launched working group on collaborative governance in the global Program for Ecosystem Change and Society (www.pecs-science.org) which is a collaboration between scientists in Australia (CSIRO), Sweden (Stockholm University), United States (Arizona State University and Alaska Fairbanks), Canada

(Waterloo University) and more.

“We are essentially looking at experiences with collaborative governance across the developed and developing world, aimed at improving practice on the ground and global theory.”

Cundill’s current Masters student, Karabo Chadzingwa, recently travelled with her to the Resilience2014 conference to present a paper on her work on land rights issues. In addition to presenting two papers, Cundill also lead a panel session on collaborative governance. A new book in which Dr Cundill has been involved was launched at the conference, entitled Principles for Building Resilience: Sustaining Ecosystem Services in Social-Ecological Systems (Cambridge University Press).

As the research group only had its beginnings this year, they are still feeling their way in terms of a funding model. “For the global work, we are submitting proposals to various funders. For the local work, for now, I am using my NRF incentive funds, and some of my RC grant. In the future this will need to be bolstered by some more serious funding as work gets off the ground,” said Cundill. “We have consciously tried something different with this group. We formed with no funding promises for the collaborators – everyone who joined has done so because they are passionate about understanding collaborative governance and improving practice in their respective contexts.”



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SEEKING SOLUTIONS TO DRUG RESISTANT DISEASES

“On the African continent alone diseases such as HIV-AIDS, malaria and TB are a serious threat to humanity with millions of lives being lost each year,” said Dr Setshaba David Khanye, a lecturer in the Department of Chemistry. “Due to organisms having evolved to become resistant to multiple clinical established drugs, there is unmet medical need for scientists involved in biomedical research to come up with innovative ideas that could lead to the development of new medicaments and regimens to deal with this recurring problem of resistance.

Working within his research collective known as the Rhodes Drug Discovery Group, Khanye’s research focus is in the areas of Bioinorganic and Medicinal Chemistry.

“Here, medicinal chemistry efforts are directed into the design of novel bioactive chemical motifs in the quest of potential agents active against causative agents of malaria, tuberculosis and trichomoniasis infections,” he explained. “More importantly, we are interested in chemical scaffolds presented to us by mother-nature to design novel drug molecules using contemporary medicinal chemistry approaches.” He has also established a new collaboration with Professor Kirkwood Land at University of the Pacific, USA, in this

research area. Prior to his appointment at Rhodes he was as a postdoctoral fellow at GlaxoSmithKline Tres Cantos, Madrid, Spain and iThemba Pharmaceuticals, Johannesburg, focusing on the development of novel anti-TB compounds. During his PhD, he worked with Professor Kelly Chibale, the founder and director of Holistic Drug Discovery Development Centre (H-3D), University of Cape Town (UCT), and Associate Professor Gregory Smith in the design of novel metalloid compounds with the primary goal to investigate the role of gold in medicines.

Currently funded by Medical Research Council (MRC) of South Africa, Rhodes University and National Research Foundation (NRF) Thuthuka, Khanye hopes their work will ultimately provide solutions for communities on our continent, including potentially helping to formulate new policies to deal with infectious diseases. “Given recently created platforms such as Drug Discovery Centre (UCT) and many others, I like to think that there has been emergence of new projects in biomedical research in South Africa, and I strongly believe that our research is well positioned to be amongst those innovative projects moving into the future. Our Minister of Science and

Technology, Mrs Naledi Pandor, highlights the role of research and innovation in South Africa and the need for academics and universities to generate more innovative ideas and projects for the better development of our country.

“My vision in the long term is through my research to build bridges that will connect the Department of Chemistry as well as the university with prominent research institutions and centres in drug discovery and development both nationally and internationally,” said Khanye. He is currently seeking funds to send a student to the USA to work in the laboratory of Professor Land and hopes that as his research grows there will be more opportunities for students. “At the end of 2014 two of my Masters students will be showcasing their work in the upcoming Frank Warren Organic Chemistry Conference organised by the Department of Chemistry at the University of Stellenbosch.



DR DAVID KHANYE WORKING WITH GRADE 11 AND 12 LEARNERS WHO VISITED HIS LABORATORY FROM MTHATHA

IN OUR NEXT ISSUE ...

We introduce you to the new Dean of the Law Department, take a look at the “impact litigation” work being undertaken at the Law Clinic and introduce you to some of our prominent Law Faculty alumni such as Eric Leach, Jos Jones and Clive Plasket among others. Finally, University Databases are increasingly under scrutiny and we look at the work Rhodes is undertaking to ensure the university is PoPI compliant.

Kerry Peter
*WORD WEAVER

creativesonclick

At Creatives on Click and Kerry Peter Word Weaver we are both independent professionals who believe in the power of creative collaboration. Uniting our skills and experience we add value to the products we offer our clients.

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