

DST-NRF Centres of Excellence

Advertising supplement to the **Mail & Guardian** June 27 to July 3 2014



Hotbeds of scientific excellence

Mandi Smallhorne

New Science and Technology Minister Naledi Pandor has a mission that is inspired by a story her father told her.

“In 1952, there was an outbreak of gastroenteritis in Port Elizabeth. The only community leaders at the time were ANC people. They did their research and found the information necessary to educate the community. They went from door to door telling people about a simple rehydration mixture of salt, sugar and water, which could and did save lives.”

Within weeks the outbreak had petered out, thanks to this crucial and evidence-based piece of scientific information. “That’s the kind of place I would like to see science occupy in our society.”

The discoveries made by scientific researchers are key to a healthy, prosperous community. “We’ve got to make science a public issue,” says the minister. “Science can help us solve some of the challenges with which we are confronted.” This includes, she says, tough challenges such as poverty, inequality and unemployment.

Because science is a pillar of economic success – countries with a robust and thriving scientific research community, which leads to applied science, are more likely to have active and growing economies.

How do you jumpstart scientific innovation? How do you encourage research? Since 1995, when the National System of Innovation came into being to address our gaps in innovation, South Africa has made enormous strides in advancing science, with the enthusiastic support of the department of science and technology (DST).

One successful measure the DST embarked on in 2004 is the establishment of Centres of Excellence, a model that creates special, multi-disciplinary nodes of science focused on solving specific and targeted challenges.

The country looked around the world for successful ideas to jumpstart innovation, draw in, nurture and retain talent and build a powerful scientific resource; they found this one in Canada, says Pandor.

“Canada had a scientific brain-drain, so they developed this model to keep and attract good scientists.”



Minister Naledi Pandor. Photo: Franco Megannonn

South Africa has taken this model and run with it, establishing a number of Centres of Excellence, each with a goal-orientated focus.

Centres of Excellence are defined by the department as “physical or virtual centres of research that concentrate existing research excellence and capacity and resources to enable researchers to collaborate across disciplines and institutions on long-term projects that are locally relevant and internationally competitive to enhance the pursuit of research excellence and capacity development”.

“We wanted to attract the best minds in the disciplines we were funding,” says the minister.

Societal challenges

The disciplines chosen for support

reflect the demands of the “Five Grand Challenges” identified by government, which the minister describes as “developing South Africa’s bio-economy, developing space science and technology, providing energy security, responding adequately to global climate change and increasing our ability to anticipate the complex consequences of change due to human and social dynamics”.

These became priority areas for investment in science, she adds, with the choice refined by reference to four criteria: where possible, to use our geographic advantages (the Square Kilometre Array leverages South African skies unpolluted by light, for instance, while solar energy leverages our high number of sunny days), the possible contribution to

economic development, the benefit to developing human resources, and whether an initiative builds on what we have achieved since the advent of democracy.

The disciplines selected were also informed by the existing capacity in the country, the minister says. “If we have the TB and HIV centre in Cape Town, it’s because there you have scientists who were already working together on the issue. Creating the centre pools that expertise; there’s also an interdisciplinary focus, so you bring in mathematicians with their mapping talents and your microbiologists.

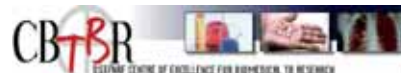
“Specialists in a range of domains are being drawn together so that we get maximum benefit from the choices we make. Teams coalesce in a natural fashion; those who

establish the centre will then attract the rest - they’ll identify what their needs are and what the gaps might be.”

Some of the centres are purposefully shared across not only universities (the University of the Western Cape shares the new Centre of Excellence in Food Security with the University of Pretoria, for instance), but also draw on expertise from other relevant institutions, such as the Council for Scientific and Industrial Research (CSIR), to leverage capacity in all spheres of our society.

With the recent announcement of five new centres, South Africa has a total of 14 multi-disciplinary intersections of scientific talent, focused on issues ranging from biodiversity

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DST-NRF Centres of Excellence

New Centres of Excellence to advance interdisciplinary research

April was abuzz with political parties on the election trail, but electioneering was not the only buzz. The Department of Science and Technology (DST) and the National Research Foundation (NRF) launched five new Centres of Excellence (CoEs) at universities in South Africa. The five new centres will promote collaborative research and provide support and postgraduate training in priority research areas.

If South Africa is going to be a leading knowledge economy, it must have the necessary skills and knowledge. Both the 1996 White Paper on Science and Technology and the 2002 National Research and Development Strategy identified CoEs as the vehicle to train the next generation of South African scientists and increase human capacity.

The new Centres bring the total number of CoEs established since 2004 by the DST and the NRF to 14.

The CoEs take the lead in researching various areas of national interest and are designed to raise international competitiveness to enhance the pursuit of research excellence and capacity development. They are physical or virtual entities of research that concentrate existing capacity and resources to enable researchers to collaborate across disciplines and institutions on long-term projects.

South Africa's DST-NRF CoEs are in the process of training the next generation of scientists and knowledge workers that will have the skills and knowledge to make South Africa a leading knowledge-based economy. The CoEs also take the lead in researching various areas of national interest and contribute to the government's priorities. CoEs were designed mainly to accelerate the delivery of appropriate human resources and knowledge capacity, as well as to enhance the international competitiveness of South African research in pursuit of research excellence and innovation.

The other nine CoEs that have been established since 2004 and an institute that is operated as a CoE are:

DST-NRF CoE for Biomedical TB Research

Aim: to research new tools for the diagnosis, treatment and prevention of tuberculosis.

Established in 2004

Hosted by the University of Stellenbosch

Director Professor Paul van Helden
Co-hosts University of the Witwatersrand, headed by Professor Baves Kana; and the University of Cape of Town, headed by Professor Valerie Mizrahi



DST-NRF CoE for Birds as Keys to Biodiversity Conservation

Aim: focusing on understanding and maintaining biodiversity using birds as indicators.

Established in The Percy FitzPatrick Institute for African Ornithology reconstituted in 2004

Hosted by the University of Cape Town

Director Professor Phil Hockey



DST-NRF CoE for Invasion Biology (CIB)

Aim: to address the biodiversity consequences of biological invasions.

Established in June 2004

Hosted by the University of Stellenbosch

Director Professor Steven Chown stepped down in May 2012 to take up the post of Professor and Chair

of School of Biology, Monash University, Australia. Professor Dave Richardson took over as director in June 2012.



DST-NRF CoE for Tree Health Biotechnology

Aim: to concentrate on understanding and combating diseases affecting South Africa's indigenous trees

Established in The Forestry and Agricultural Biotechnology Institute was reconstituted in 2004 Hosted by the University of Pretoria

Director Professor Mike Wingfield



DST-NRF CoE in Catalysis

Aim: to drive innovation in catalysis, a key process in the chemical and manufacturing sector

Established in 2004

Hosted by the University of Cape Town

Director Professor Michael Claeys.



DST-NRF CoE in Strong Materials

Aim: seek to understand and improve the properties of advanced



NRF CEO, Dr Albert van Jaarsveld

strong materials to increase their efficiency and reduce their cost

Established in 2004

Hosted by the University of the Witwatersrand

Director Professor Lesley Cornish



DST-NRF CoE in Epidemiological Modelling and Analysis

Aim: to use mathematics to understand, predict and ultimately combat diseases

Established in 2005

Hosted by Stellenbosch University and located at Stellenbosch Institute for Advanced Study

Director Dr Alex Welte



DST-NRF CoE in Applied Climate Change and Earth System Science

Aim: to deliver a new scale of intervention in earth systems science in southern Africa

Established in 2009

Hosted by the Council for Scientific and Industrial Research (CSIR).

Director The CoE was conceived and initiated by Professor George Philander, developed further under the leadership of Dr Jimmy Adegoke and is now being managed by Dr Neville Sweijd



DST-NRF CoE in Palaeosciences

Aim: to address research questions relating to the South African Palaeosciences heritage record. The themes are conceptually linked to serve the ambitions of four overarching key research questions: How does the South Africa's Palaeosciences record improve our understanding of the origins of species? What are the key behavioural transitions in hominid prehistory, including the origins of modern human behaviour? What are the Earth systems that drive evolution? What are the roles of extinctions and radiations in the evolutionary process?

Established in 2013

Hosted by the University of the Witwatersrand

Director Professor Bruce Rubidge.



National Institute for Theoretical Physics (NITheP)

Aim: to sustain stimulating theoretical physics research in South Africa

Established in 2008

Hosted by the University of Stellenbosch

Director Professor Frikkie Schlotz
Co-hosts the University of KwaZulu-Natal and University of the Witwatersrand



For more information on the DST-NRF Centres of Excellence funding instrument, please contact Dr Romilla Maharaj, acting executive director: research chairs and centres of excellence, at romilla@nrf.ac.za or Dr Nthabiseng Taole, director: research chairs and centres of excellence at nthabiseng.taole@nrf.ac.za

Hotbeds of scientific excellence

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to tuberculosis to strong materials (materials with commercial potential that retain their properties under extreme conditions).

There are also two centres that don't have the same standing academically as the rest, the National Institute for Theoretical Physics (NITheP) and the DST-NRF Centre for Indigenous Knowledge Systems (IKS).

Developing capacity

The primary and most important goal of the centres is innovation. "There must be some benefit that accrues to South Africa," says Pandor. But not far behind this goal is developing human capacity in a range of sciences.

During the 2012/13 financial year, the nine centres of excellence then in existence and the NITheP produced

outstanding results, including 880 publications in research literature (publication is a major measure of the work done by scientists).

But they also, critically, supported 652 postgraduate students, a 75% increase over 2011. An active focus on transformation also bore fruit, with a total of 300 female students getting support from the centres. And, for the first time, more than half the students were black.

Putting a group of accomplished scientists together with decent funding is naturally going to further the aim of offering study and research opportunities to young people.

"By establishing centres that draw this repository of intellectual worth together, we support both our objectives as a government and a range of scientific objectives: development of

human resources, publication and support for innovation."

The National Research Foundation is tasked with oversight of the centres and reports to the DST. If a centre is not meeting its goals in a range of aspects, from development of human capital to publication, questions will be asked and, of course, the ultimate sanction – the withdrawal of funding – can be applied.

The long-term nature of the funding is one of the most attractive aspects of the Centres of Excellence for scientists both here and around the world. Far too often funding for research is project-dependent and covers a relatively limited period, perhaps three years.

Research initiatives do draw collectives of people together, but they scatter again as the project draws

to a close. A legacy of shared knowledge and experience, and of human capital development, may well be lost or diluted that way. In contrast, South Africa's centres of Excellence are assured of funding for extended periods. In fact, following a recent review, seven of the centres had their funding extended from 10 years to 15 years, and two Centres that had been only 50% funded will now be fully funded.

Scientists know that it is possible to do solid and innovative work in these time periods.

"I think we must say kudos to the Treasury, because they've understood that you need this level and nature of funding to make the advances that we want as South Africans," Pandor comments.

The potential rewards of the Centres of Excellence are already

apparent. One example: scientists at the CSIR have developed a novel technology to convert the rare mineral titanium, usually provided in ball-form, into a powder, which is easier to use. They're now piloting its production in industrial quantities. Meanwhile, young scientists in the Western Cape are working on producing hydrogen cells and at the University of Johannesburg promising solar energy technology is being advanced. "We have the mineral resources and we have the geographic advantage to play in this space of renewable energies," says the minister with a smile.

"I'm thrilled that we have these Centres of Excellence, and that we've been able to attract such talented scientists; I would like to see government expanding the model, because it works so well."

DST-NRF Centres of Excellence



Former Minister, Derek Hanekom at the launch of the CoE in Mathematical and Statistical Sciences, University of the Witwatersrand

Making research add up

The first of the new Centres of Excellence (CoEs) launched was the CoE in Mathematical and Statistical Sciences at the University of the Witwatersrand in April this year. Delivering the keynote address, then-minister of science and technology Derek Hanekom said: “The DST-NRF Centre of Excellence Programme is one of several instruments that are in place to bolster our innovation system. On the one hand, these centres enable us to capitalise on our country’s natural advantages, such as large platinum deposits, a clear view of the southern skies, and an incomparably rich array of paleontological fossils. On the other hand, the centres assist in identifying our disciplinary weaknesses or socio-economic threats, and then set about addressing them.

“Mathematics is the spinal cord of science, engineering and technology development and, as such, it is critical to South Africa’s National System of Innovation (NSI) and to our future as a competitive, knowledge-based economy. This is most obviously the case, perhaps, in respect of applied and computational mathematics, but these cannot be divorced from pure mathematics; thus it is intrinsically true of mathematics overall. This is why the National Development Plan (NDP) places such importance on improving mathematics education from primary school through to university, and why we, and the rest of the world for that matter, need increasing numbers of doctorates in mathematics, among other



Launch of the CoE in Mathematical and Statistical Sciences, University of the Witwatersrand

Professor Ebrahim Momoniat, head of the School of Computational and Applied Mathematics at Wits, said: “It is under two sub-themes – ‘Mathematical Paradigms for Earth and Environment’ and ‘Mathematical, Statistical and Computational Modelling of the Earth and Environment’ – that the centre will bring together the exciting research excellence that exists at universities, research entities and other CoEs to make a major contribution to the NDP, training of the next generation of scientists and the development of a knowledge based economy.”

“Mathematics is the spinal cord of science, engineering and technology development and, as such, it is critical to South Africa’s innovation”

happen in isolated areas,” said Momoniat. “It happens when you combine areas like computer science with graph theory or symmetry and computer science. Rather than having those pockets of excellence sitting everywhere, we can make a bid to the National Research Foundation, have winter schools, bring all those areas together and do new mathematics.” According to Momoniat, all of us are, in some way, inherently mathematical.

“You use it all the time without knowing. When you drive, for instance, you’re using circular motions, geometry. We’re in tune with spatial awareness and that’s probably the first notion of mathematics.”

The director of the CoE in Mathematical and Statistical Sciences, Professor Fazal Mahomed of the Wits School of Computational and Applied Mathematics, said: “We have aspired to host a CoE

Differential Equations, Continuum Mechanics and Applications and we wish to be as inclusive as possible. Our network has grown and we want to sign more memoranda of understanding with other research institutions.”

The programme brings together several “pockets of excellence” at local universities and institutions to accelerate growth and further innovation. Other collaborating partners are North-West University and the Universities of Pretoria, KwaZulu-Natal, Venda and South Africa, the Council for Scientific and Industrial Research and the African Institute for Mathematical Sciences.

The launch of the DST-NRF CoE in Mathematical and Statistical Sciences at the University of the Witwatersrand will see the institution host its third CoE. The two Centres already being hosted by the University are the DST-NRF CoE in Palaeosciences and DST-NRF CoE in Strong Materials.



University of Venda



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The contents of this supplement were supplied and signed off by the National Research Foundation

DST-NRF Centres of Excellence



Deputy vice-chancellor for Research at SU Professor Eugene Cloete, Minister Derek Hanekom, CoE director Professor Johann Mouton and NRF Chief executive Dr Albert van Jaarsveld

Creating a comprehensive policy

Scenic Western Cape formed the backdrop for the launch of the Centre of Excellence (CoE) in Scientometrics and Science, Technology and Innovation (STI) Policy, co-hosted by Stellenbosch University (SU) and Tshwane University of Technology.

It is the fourth CoE to be hosted by Stellenbosch University. The other CoEs that are hosted by SU are the DST-NRF CoE for Invasion Biology, DST-NRF CoE for Epidemiological Modelling and Analysis and DST-NRF CoE in Biomedical TB Research.

The National Institute for Theoretical Physics, which functions as a CoE, is also hosted by SU.

The Institute for Economic Research on Innovation will also co-host the Centre, the South African Centre for Higher Education Trust and the University of Leiden's Centre for Science and Technology Studies will be collaborating partners to this new CoE.

The CoE brings together a wealth of experience and expertise in the field of bibliometrics, scientometrics, science and innovation policy, higher education studies, the sociology of science, science communication, research evaluation and research impact assessment.

The CoE in Scientometrics and STI Policy will be housed in the Centre for Research on Evaluation, Science and Technology (Crest).

Crest was established in January 1995 as an interdisciplinary research centre of SU's faculty of arts and social sciences. Since the late 1990s its work focused more on the sociology of science and science policy

issues, and – more recently – also on knowledge production in higher education.

Professor Eugene Cloete, vice rector for research and innovation at SU, said: "The award recognises the expertise of Stellenbosch University and is in line with the university's institutional intent and strategy, which aims to identify and focus on areas of research."

Professor Johann Mouton, CoE director and director of Crest, explained how it will work: "Four main thematic areas have already been identified for the new CoE. First are STI Indicators (the quantitative measurement of science), aimed to strengthen expertise in the design, development and production of indicators of the research and innovation system, including science, technology and development, and linkage between research and innovation.

"Second is STI Policy for Development, aimed to synthesise the activities of the CoE towards its policy analysis role and it will study the dynamics shaping science. Technology and innovation capabilities, and the way the various actors engage in this process. This is Human Development for STI, aimed at obtaining a better understanding of the dynamics of human development and STI in in South Africa and on the African continent.

"A specific focus will be on the role of HEI's in developing human resources for Science and Technology. Finally, Science Communication, Evaluation and Impact is aimed at studying the nexus of issues related to science communication, dissemination,

uptake and utilisation strategies and the measurement of scientific and social impact."

At the launch of the CoE on April 3, then-minister of science Derek Hanekom remarked: "The irony is that while scientometrics played an important role in encouraging government to initiate the CoE programme, it is only now that the programme is introducing a CoE relating to scientometrics; however, rather late than never."

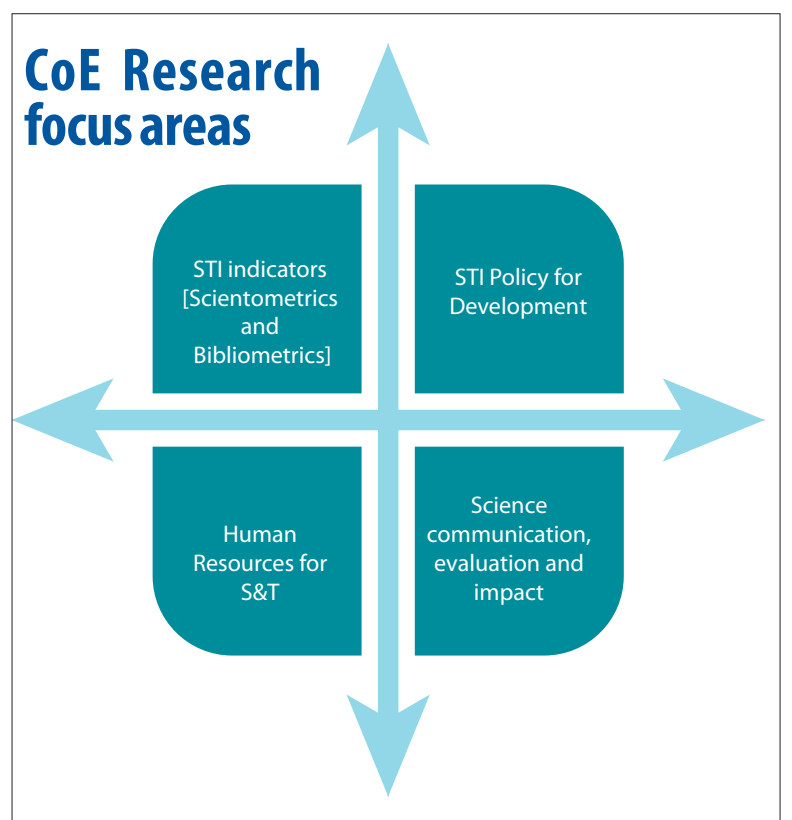
He added: "This CoE must build on our existing capacity in scientometrics and STI policy; it must foster additional capacity and take our ability to understand and fine-tune our innovation environment and policy to a new level".

The chief executive of the NRF, Dr Albert van Jaarsveld, said: "As the managing agency of the DST-NRF Centres of Excellence, we are confident that this Centre of Excellence will not only lead to the advancement of knowledge and human capital development, but, more importantly, will also help to increase the efficiency of our country's use of its knowledge resources. Through the production of high-quality, research-based evidence, this centre will lead to improved decision making in STI policy".

In addition to the core team members of the CoE, the partnership will also boast an impressive list of international scholars in a wide range of complementary fields. These scholars add immense value to the CoE and have all expressed their desire and commitment to participate in the different work programmes of the new centre.



CoE director Professor Johann Mouton



DST-NRF Centres of Excellence

Food security challenges

On April 15, then-minister of science and technology Derek Hanekom launched the Centre of Excellence (CoE) in Food Security at the University of the Western Cape (UWC). This is the first previously disadvantaged university to host a CoE.

The university will co-host the CoE with the University of Pretoria (UP), which already hosts the DST-NRF CoE in Tree Health Biotechnology.

Rector and vice-chancellor of the UWC Professor Brian O'Connell said that the university was honoured to host the CoE.

"The university can be seen as a metaphor for Africa: we have accomplished great things at this institution and on this continent. I look forward to the coming engagement with the University of Pretoria, and I believe that the two institutions will together create magic."

Food security has been defined as access by all people, at all times, to enough food for an active and healthy life. According to a study released in 2013 by the Human Sciences Research Council, more than half of South Africa's population does not have regular access to enough food. Studies show that in South Africa, where more than 60% of the population is urbanised and food insecurity is widespread, approximately 45% of people live below the poverty line.

Professor Julian May, the CoE director, during his launch presentation titled "Can science and good governance deliver dinner?", emphasised the importance of food security.

"In South Africa, more than 20% of people are food insecure and this must change drastically. We will make a difference to food security by linking innovative science to critical enquiry," he said.

In the next 40 years, we will need to produce more food than we have produced over the last 8 000 years. Future challenges coupled with greater climatic variability, increased demand for animal protein, increased cost of energy and the decrease in the availability of water will play an immense role in how we feed ourselves in the future.

Will we succeed if good science is supported by good governance and policy is evidence-based? Food security is not having a freezer filled with our favourite goodies at home, but it exists when all people at all times



DST-NRF Centre of Excellence in Food Security launch at the University of the Western Cape. Photo: supplied

have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.

Key activities

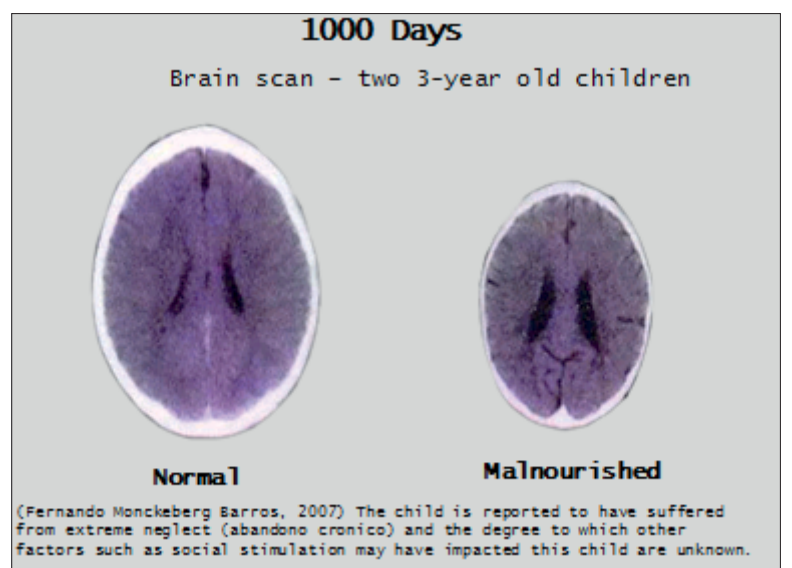
The CoE in Food Security will address a number of activities with its institutional collaborators. The goal of food creation will be led by UP's John Taylor and his students, who have already developed a nutritious sorghum biscuit - two biscuits a day can supply up to 20% more energy for young children of school going age. The University of Fort Hare's Voster Muchenje and his colleagues will tackle the "farm to fork" approach to meat science and Kennedy Dzama and colleagues at the University of Stellenbosch will exploit genetic resources of indigenous cattle for commercialisation.

Food distribution activity studies will be undertaken by the team from AFSUN Cape Town at the African

Centre for Cities and the University of Western Cape. Consumption activity studies on rural and urban sites will be undertaken by the University of Western Cape and North-West University. Studies on food security and governance will be undertaken by the co-host institution, the University of Pretoria.

Why does food security matter? In 2007 a study was conducted on the brains of two three-year-old children. One was a normal three-year-old and the other a malnourished three-year-old. The brain scan of the normal health three-year-old appeared big and far more developed than that of the malnourished three-year-old child.

From this study we see the effects of malnutrition and why food security matters and should be a concern for government and policy makers. This affects human development and wellbeing though out the lifespan of the human. Food insecurity means that rural consumers and house-



Brain scans of two three-year-old children illustrating how the brain of a malnourished child is significantly smaller in comparison to that of a normal three-year-old child

holds pay more than their urban counterparts for the same food basket and healthier food becomes increasingly expensive and scarce.

Activities of the Centre

- Food Creation** - Production, processing & preservation
- Food Distribution** - Markets, livelihoods & value chains
- Food Consumption** - Health, nutrition, choice & behaviour
- Food Governance** - safety, standards, policy & rights

DST-NRF Centres of Excellence

Investing in people power

April 22 this year saw the launch of the Centre of Excellence (CoE) in Human Development. Jointly hosted by the University of the Witwatersrand and the University of KwaZulu-Natal, it will focus on human development from conception through the human life cycle, including adolescence, early adulthood and becoming economically independent.

This new CoE incorporates research programmes in development, livelihoods and health led by the University of KwaZulu-Natal with research programmes in child development led by the University of the Witwatersrand.

At the launch, Deputy Minister of Science and Technology Michael Masutha said the CoE would ensure a better response to child development challenges in the country.

"The centre will combine the multidisciplinary expertise of estab-

lished scholars with dedicated research groups working on child development. The team's diverse strengths will enable a better understanding of the challenges in respect of child development in South Africa, improve the country's ability to address these challenges, and advocate for the most cost-effective interventions to give all children the best possible start in life," he said.

Professor Cheryl Potgieter, deputy vice-chancellor and head of the College of Humanities of the University of KwaZulu-Natal, said that the university welcomed the opportunity to co-host the CoE with the University of the Witwatersrand.

"Partnerships are the cornerstone of the development framework and essential in mobilising support and investment", she said. "In line with the Millennium Development Goals, the Centre will focus on human capacity, particularly economic participation and health, which will



CoE director, Dr Linda Richter

contribute significantly to enhancing and empowering the youth and ultimately all South African citizens."

Professor Linda Richter, director of the CoE in Human Development, said: "We think of human development as three

different but related processes: First is the development of human beings from conception to death. Second is lifecycle development from one generation to the next and third is socioeconomic development. These processes, while

distinguishable, are inseparable from one another and each mirrors the other and thus must be studied in relation to one another. A foundational feature of the CoE in Human Development is studies situated in time to study change."

The team's diverse strengths will enable a better understanding of the challenges in respect of child development in South Africa, improve the country's ability to address these challenges



Deputy vice chancellor for research at the University of the Witwatersrand Dr Zebulon Vilakazi



Former Deputy Minister of Science & Technology Tshililo Masutha, CoE director Dr Linda Richter, NRF Chief executive Dr Albert van Jaarsveld

The key characteristics of human development across the lifespan, inter-generationally and among groups of people is CHANGE. Therefore, human development must be studied across TIME.



Janus — the Roman god of beginnings, traditions and endings

Combining strengths: Focus areas for human development

- Growth, health and development
- Mental health and wellbeing
- Parents and families including fatherhood
- Violence
- Livelihoods
- Innovation and methods
- Evaluation and policy



DST-NRF Centres of Excellence



Former deputy minister of science and technology Tshililo Masutha at the launch of CIMERA, University of Johannesburg. Photo: supplied

Building mineral wealth

The final Centre of Excellence (CoE) of the new cohort of centres launched was the CoE for Integrated Mineral and Energy Resource Analysis (Cimera), hosted by the University of Johannesburg. It will promote collaboration between South African economic geology research units, such as the university's Paleoproterozoic Mineralisation Centre and the Economic Geology Research Institute of the University of the Witwatersrand.

The CoE's chief objective will be to develop an integrated understanding of some of the country's major and minor mineral and fossil energy resources and their geometallurgical characteristics, to ensure the sustainable extraction of resources, while preventing and mitigating negative environmental effects.

Delivering the keynote address at the launch, Deputy Minister of Science and Technology Michael Masutha said: "No industry is more closely linked to South Africa's economic psyche than the mining and minerals sector, which has defined the country's social and economic landscape since the 1800s."

He challenged the new CoE to

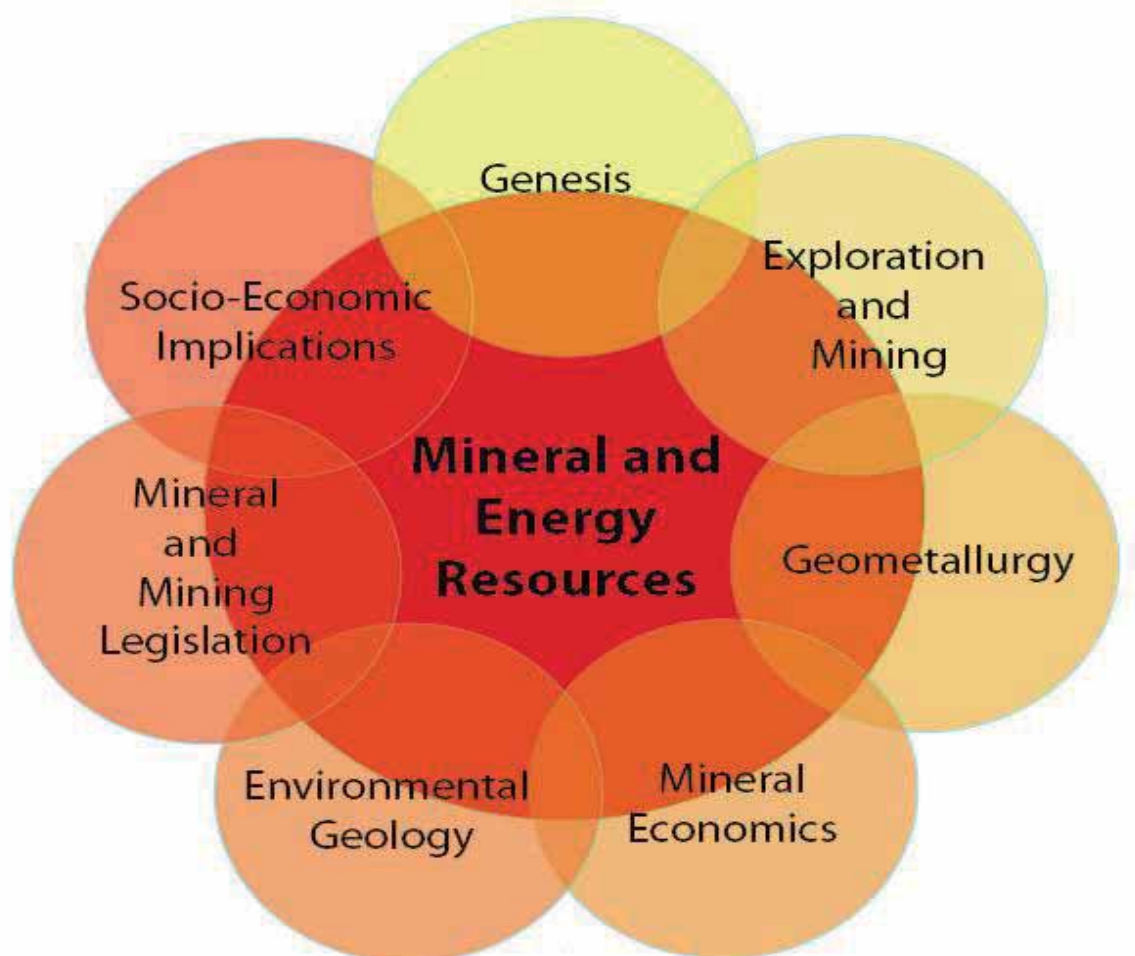
No industry is more closely linked to South Africa's economic psyche than the mining and minerals sector

build a representative cohort of South African researchers.

Cimera director Professor Nic Beukes described the CoE's eight key research areas: the metallogenesis of early Earth mineral systems; South Africa's superlative mineral resources; fossil energy resources of sedimentary basins; small-scale mining operations in Africa; critical metals of the future; new bulk mineral resource developments in Africa; environmental and medical geology; and public awareness and education.

From its research findings, the CoE will make available information to policy makers and the community, pertaining to mineral and fossil fuel deposits in general. This could include, for instance, information that could inform policy decisions on allocation of mineral rights and infrastructure development; information that could potentially attract foreign investments; and information pertaining to mineral and fossil fuel deposits that are too small for large mining houses to be interested in, but which would be ideal for the establishment of small mining operations by local communities. This would foster further development of the small-scale mining sector in South Africa.

The centre will collaborate with Rhodes University, Stellenbosch University, University of Fort Hare, University of Pretoria and University of Venda.



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Through the funding of scientific and technological research, development of human capacity and provision of research facilities, the National Research Foundation is helping to build South Africa's potential in the global knowledge economy. As the largest science agency in Africa, we work closely with the private and public sector, universities and other higher education institutions in building the country's research infrastructure through grants and bursaries; funding new and existing scientists; and exploring new and indigenous knowledge for the benefit of all South Africans.

The NRF, Helping realise South Africa's full potential.

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