

# Women in Science

ADVERTISING  
SUPPLEMENT TO THE  
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science  
& technology

Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA

## Science and technology to develop rural women and end poverty

The Department of Science and Technology (DST) hosts the South African Women in Science Awards (WISA) annually to recognise and reward the achievements of South African women scientists and researchers

By Minister of Science and Technology Naledi Pandor

Over the last 10 years, beginning in 2003 to be exact, the Department has held the awards during Women's month to coincide with the nation-wide celebration of women and their achievements. WISA winners are profiled as role models for younger scientists and researchers. Women have continued to be a majority of the overall undergraduate and lower postgraduate (honours level) enrolments and graduations over the past ten years. However, at Master's level, women are underrepresented in the total enrolments and graduations. Overall, women are a clear minority at the upper postgraduate levels (Master's and PhD levels) in terms of both enrolments and graduations. Despite the low



Minister of Science and Technology Naledi Pandor

enrolments at upper postgraduate levels, I am encouraged that women constituted approximately 50% of students supported by the National Research Foundation (NRF) at both Master's and PhD levels over the last three years (2009/10 to 2011/12).

The timing of WISA in August positions it to build on the momentum established by the National Science Week in positively influencing the perceptions, choices and attitudes of young people towards SET.

This year, the theme for the Women in Science Awards is "Using Science and Technology to Develop Rural Women and End Poverty". This

theme is in line with the 2012 United Nations Theme for women, namely "Empower rural women and end hunger and poverty", and also takes cognisance of Parliament's theme for 2012, namely "Knowledge Economy and Development Opportunities". The 2012 Women in Science Awards also coincide with our celebration of the South African-German Year of Science (YoS) and as such, this edition of Awards is supported by our German counterparts.

### The Categories

The awards are made in three categories, namely Distinguished

Women in Science, Distinguished Young Women in Science and DST Fellowships. The Distinguished Women in Science and Distinguished Young Women in Science awards will be made in three areas, that is Social Sciences and Humanities, Physical and Engineering Sciences and in areas of research (open) that contribute to the development of rural women in line with this year's theme.

### Distinguished Women in Science

These awards go to women scientists and researchers who have made an outstanding scientific contribution to advancing science and building the knowledge base in their respective disciplines. The criteria used for this category include consideration of the nominee's teaching and research experience, research and innovation outputs, national and international eminence, and experience in supervision and mentorship aimed at achieving equity and redress. Distinguished Women in Science awards are made in each of the following areas:

- Social Sciences and Humanities
- Physical and Engineering Sciences

### Distinguished Young Women in Science

These awards go to young women scientists and researchers who have made an outstanding contribution to advancing science and building the knowledge base in their respective disciplines. The criteria used for this category are the same as those used for the Distinguished Women Scientists category, except that the

nominees must be under the age of 40 years. Distinguished Young Women in Science awards are made in each of the following areas:

- Social Sciences and Humanities
- Physical and Engineering Sciences

### Awards for the Development of Rural Women

These awards will be made to women scientists or researchers for the contribution and empowerment of rural women through the efforts and/or outputs of their research activities (in any field). The criteria for these awards are the impact of the research on the social and economic development and empowerment of rural women; recent research outputs and their environmental impact; the role and participation of rural women communities in research or exploitability of the research outputs to the development of rural women (for example the possibility of using the research results to develop or improve products, processes and services). Awards are made in each of the following categories:

- Established Researcher
- Emerging Researcher

### DST Fellowships

These awards are made to six Master's and six doctoral students who are currently involved in full-time study or research leading to a masters or doctoral degree, respectively. These awards recognise outstanding ability and potential in research, enhance the women's research experience and output and encourage more young women to complete research degrees.

## German-South African Year of Science 2012/2013

South Africa and Germany are united by a long-standing, successful partnership. Since 1996 they have enjoyed mutual collaboration in the fields of science and technology. Germany has a great deal to offer in the fields of technology and applied sciences. South Africa, for its part, is a research location of unprecedented value, for weighty issues that people are working on all over the world – water, climate, energy, biodiversity, health and education – are present in South Africa in concentrated form.

Both countries are underlining the special significance of their collaboration by organising the German-South African Year of Science

2012/2013, which was initiated by the German Federal Minister of Education and Research, Annette Schavan, and the South African Minister of Science and Technology, Naledi Pandor, on April 16 2012.

### The goals of the German-South African Year of Science 2012/2013

The German-South African Year of Science 2012/13 aims to achieve the greatest possible degree of cooperation between these two centres of scientific endeavour. Germany and South Africa want to assume joint responsibility for tackling global challenges and, with this in mind, are determined to intensify their communication and cooperation.

### The Year of Science objectives

- To emphasise the diversity and excellence of the German-South African initiatives and projects in the fields of research and technology for the purpose of promoting Germany and South Africa as centres of innovation vis-à-vis research-conscious institutions and companies in the two countries.
- To establish a new quality of bilateral cooperation, for example by setting up new partnerships between German and South African research institutions, universities, colleges and companies, as well as intensified collaborative arrangements between ministries

and intermediary and support organisations.

- To intensify the exchange of views, insights and information between young scientists in the two countries.

### Thematic areas of the Year of Science

The discussions between the Department of Science and Technology and its German counterparts culminated in agreement on the following thematic areas to be highlighted during the Year of Science:

- Astronomy
- Climate change
- Bioeconomy

- Human capital development
- Health innovation
- Social sciences and humanities
- Urbanisation and megacities

Furthermore, the Year of Science incorporates some existing activities that are on the Department's annual calendar of events, such as the Women in Science Awards.

The 2012 Women in Science Awards seeks to recognise women who have performed exceptionally well in various fields of science.

The awards were presented to the winners on August 24 2012 at a gala dinner in Centurion, hosted by Minister Pandor.



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REPUBLIC OF SOUTH AFRICA



2012 | 2013

Deutsch-Südafrikanisches  
Jahr der Wissenschaft  
German-South African  
Year of Science



Federal Ministry  
of Education  
and Research



## Women in Science Awards

## Advertorial

# Distinguished Women Scientists Physical and Engineering Sciences

### Winner Prof. Alison Lewis

Prof. Alison Lewis graduated with a BSc (Chemical Engineering), MSc (Chemical Engineering) and PhD, all from the University of Cape Town (UCT). She is a registered professional engineer and a professor in the Department of Chemical Engineering at UCT. She is also the UCT Orator.

Her interest in chemical engineering grew after being inspired by the realisation that the practical application of mathematics and chemistry was fundamental to the field. She started a new group specialising in crystallisation and precipitation research, and the group has since become one of the accredited research units at UCT.

The research unit is funded by a range of national and international companies and consists of five staff members, one postdoctoral researcher and 15 postgraduate students. Since the research unit's inception, 24 Master's and PhD students have graduated and they have published between them more than 100 international peer-reviewed publications, a patent, eight book contributions and 85 conference presentations.

Both her MSc and PhD degrees focused on applied mathematical models for water treatment, and her research interests revolved around water treatment, and more recently, water refining. Prof. Lewis's research highlights



crystallisation as a tool to purify metals such as platinum, palladium and rhodium, as well as its potential to treat contaminated water, such as acid mine drainage. She believes that it is essential to design water-treatment processes that are sustainable; they must not only produce pure water, but also recover the contaminants as useful products. This is now her main

research focus.

Prof. Lewis has received a number of awards and honours, including the 2010 NRF President's Award for research capacity development and a number of best conference paper and poster awards. She is also a member of the Academy of Science of South Africa and a fellow of the South African Academy of Engineering.

### Runner-up Prof. Leslie Petrik

In May 2008, Prof. Leslie Petrik received her PhD in chemistry from the University of the Western Cape (UWC) in the field of fuel cell and renewable energy technology. She is currently an associate professor, leading the environmental and nanoscience (ENS) group in UWC's Department of Chemistry. The group does postgraduate research in nanoscience, nanotechnology and environmental remediation. Under her leadership over the last six years, more than 60 students (at honours, MSc, PhD, NDT and MTech level) have graduated from ENS programmes. Prof. Petrik was a winner of the Department of Trade and Industry's technology award in the THRIP (Technology and Human Resources for Industry Programme) Quality and Quantity of Students category in 2010.

Prof. Petrik has focused primarily on environmental remediation and nanotechnologies for water purification and waste remediation, with a specific emphasis on how nanotechnology may be beneficially applied in this field. Recent breakthrough technologies patented by Prof. Petrik show how low-cost nanostructured adsorbents can be prepared from waste fly ash, and applied to remove toxic metals and other pollutants from water, how organic pollutants and problem bacteria in water can be completely decomposed and destroyed in a simple, one-step



process using an electrohydraulic discharge system, and how fly ash can be used to treat and purify acid mine drainage from coal and gold mining. Since 2008, Prof. Petrik has published seven patents, eight book chapters and more than 48 (out of a total of 67) scientific papers in internationally accredited journals. Prof. Petrik is a reviewer for several international journals and NRF grants and ratings. Her work has attracted numerous research grants and resulted in collaboration with several international research organisations and universities in the USA, Russia, Finland, Poland, Turkey and France.

## Social Sciences and Humanities

### Winner Prof. Relebohile Moletsane

Prof. Relebohile Moletsane received her PhD from Indiana University in Bloomington, Indiana, USA, in 1996.

Prof. Moletsane is currently a Professor and JL Dube Chair in Rural Education in the Faculty of Education at the University of KwaZulu-Natal (UKZN). She has extensive experience in teaching and research in the areas of curriculum studies, gender and education, HIV and Aids education, and girlhood studies in Southern African contexts. Her methodological inter-

ests include the use of participatory visual methodologies in doing research and development work with marginalised groups. She is working on a project which uses digital story-telling with teachers (*Through the eyes of women teachers: Indigenous knowledge systems and teaching in rural schools in the age of Aids*), and has published several articles and book chapters on using digital technology and digital storytelling in rural communities, including cellfilms, short videos,

photo-documentaries and photo narratives. She is also the co-author (with Claudia Mitchell, Ann Smith and Linda Chisholm) of the book *Methodologies for Mapping a Southern African Girlhood in the Age of Aids*, a co-editor (with Kathleen Pithouse and Claudia Mitchell) of the 2009 book *Making Connections: Self-Study & Social Action* and the lead editor (with Claudia Mitchell and Ann Smith) of a 2012 book called *Was it Something I Wore? Dress, Identity, and Materiality*.



### First runner-up Prof. Liesel Ebersöhn

Prof. Liesel Ebersöhn obtained her PhD in Educational Psychology from the University of Pretoria in 2000. She is director of the Unit for Education Research in Aids and professor of Educational Psychology at the University of Pretoria. Prof. Ebersöhn is known for her work on resilience in scarce-resource and high-need education settings. She serves on the council of the World Education Research Association (WERA) and was nominated to co-chair the WERA Task Force on Poverty and Education. Prof. Ebersöhn is the editor of the *South African Journal*

*of Education* and a past president of the Education Association of South Africa. Prof. Ebersöhn has authored and co-authored 44 articles in various refereed journals. She has been co-author, editor or co-editor of five books and 11 book chapters. Of the 53 postgraduate students she has supervised to completion, many are now scholars at higher education institutions. Her projects have led to an understanding of how resilience, as opposed to pathology, is an alternative social response to adversity. Her collaborative knowledge generation has had a decided impact on

curricula for teacher training. Since 2003, scores of in-service distance education students have, based on her doctoral research, gained knowledge to view children from a strengths-based and coping perspective. Based on research under her mentorship, pre-service teacher education students become equipped to understand their contribution to promoting kaleidoscopic wellness in resource-scarce and HIV-challenged schools, rather than being focused on the microscopic pathology of Aids, poverty and aligned adversities. Prof. Ebersöhn currently holds an NRF C-rating.



### Second runner-up Prof. Annet Wanyana Oguttu

Prof. Annet Wanyana Oguttu completed her LLD in tax law at the University of South Africa (Unisa) in 2008. She was the second woman to have completed a doctorate in tax law at a South African university, and the first black woman to have done so. She is currently a professor of tax law in the Department of Mercantile Law at Unisa, making her the first black woman to be a full professor

of law at Unisa. She is the subject head of the tax law group, at the forefront of developing new qualifications and modules in tax law and supervises postgraduate dissertations and theses in tax law. She is also an instructor for the international tax law course at the University of Pretoria's African Tax Institute. In 2009, she pursued postdoctoral studies in international tax law at the

University of Michigan.

Prof. Oguttu has published 23 articles in top national and international journals, of which 18 are in peer-reviewed journals on topics relating to international tax law. Her publications have contributed to alleviating the current dearth of information on international tax law issues from a South African perspective.

Prof. Oguttu is a member of

the editorial board of the *Global Studies Journal* and she has peer-reviewed many tax law articles for various national and internationally accredited journals. She is an NRF C2-rated researcher and the first black woman in the College of Law at Unisa to receive an NRF rating. She received the Unisa 2011 Women of the Year and the Unisa 2010 Top Performer awards.





## Women in Science Awards

## Advertorial

# Distinguished Young Women Scientists Physical and Engineering Sciences

### Winner Dr Rapela Regina Maphanga

Dr Rapela Regina Maphanga completed her PhD in Physics from the University of Limpopo in 2005. Dr Maphanga is currently a senior researcher at the university's materials modelling centre, which she joined in 2007, following her post-doctoral research on computer simulations of energy-storage device materials. Her research focuses on computational modelling of cathode materials for lithium-ion batteries that are used in energy-storage devices. Her primary research interest is theoretical or computational modelling of materials, using both first principle and

atomistic simulation methods. This involves prediction of the structure, mechanical, thermal, transport and electronic properties of advanced materials using first principle calculations and classical atomistic simulations. Dr Maphanga has published her research findings in high-profile scientific journals and is a junior associate at the Abdus Salam International Centre for Theoretical Physics in Italy. She has supervised to completion one PhD, four Master's and six honours students. She has published 13 articles in peer-reviewed journals. Dr Maphanga was a visiting researcher at University

College London, UK, in 2010 and 2011. She represented South Africa during the World Economic Forum's annual meeting of the New Champions in China in 2011, and was selected as member of the Global Young Academy, including being a member of the academy's science education and women in science working groups. She served on the Women in Physics in South Africa group from 2009 to date. In 2012 she was featured in *Mail & Guardian's Top 200 Young South Africans* and the *Book of South African Women*. Dr Maphanga is also a science advisor for Wiley Publishing.



### Runner-up Dr Khoboso Christina Lehloeny

Dr Khoboso Lehloeny obtained her PhD (Agric) in Animal Science at the University of the Free State in 2008. Immediately after graduating, she worked at the same university for six years, first as a junior lecturer and later as lecturer. She is currently a senior lecturer at the Tshwane University of Technology.

Dr Lehloeny's research focus is the use of assisted reproduction technologies in farm animals as a breeding management tool to speed up the genetic progress and to conserve valuable genetic material. She received NRF Thuthuka funding for her research in the same

field during her doctoral studies.

Dr Lehloeny has supervised four postgraduate students, published 16 journal articles and five peer-reviewed conference papers/abstracts, and has contributed to 26 peer-reviewed conference proceedings. She is a reviewer for a number of local and international journals, serves as an editorial board member of *Small Ruminant Research Journal* and is a council member of the South African Society for Animal Science (2011-2013). She was invited by the European Embryo Transfer Association (Chester, UK, 2011) to

give a talk in a workshop entitled "Multiple Ovulation and Embryo Transfer in Goats: the South African perspective".

Dr Lehloeny's application of her research work in projects that directly benefit the community was recognised through an honorary award for community service at the University of the Free State. She was also a recipient of both a Junior Researcher Award in 2010 and an Emerging Female Researcher Award in 2012 from the Tshwane University of Technology. Dr Lehloeny is an NRF Y-rated researcher.



## Social Sciences and Humanities

### Winner Prof. Sarojini Nadar

Prof. Sarojini Nadar completed her PhD at the University of KwaZulu-Natal (UKZN) in 2003, at the age of 27. Prof. Nadar was recently appointed as UKZN's College of Humanities' Dean of Research, and is Associate Professor in the Gender and Religion Programme at the School of Religion, Philosophy and Classics.

Coming from a working-class background, her road to academic success was not an easy one. The youngest of seven children, she was the only one in her family to finish high school and go to university. Her childhood expe-

riences sparked her research interest in gender-based violence, particularly the role of systems such as religion in either maintaining and promoting such violence, or preventing it. Prof. Nadar has researched and published widely in the field of feminist biblical hermeneutics, with a special focus on HIV and Aids, gender-based violence, masculinity and sexuality. She also has a special interest in studying and developing theories of feminism in Africa.

Prof. Nadar received the University Research Award for Top Published Woman Researcher (2009), and

she was also among the Top 30 Researchers at UKZN in 2010. In 2008 she was profiled as one of the leading South African women in her field in the *Mail & Guardian Book of South African Women*. The book, *African Women, Religion, and Health: Essays in Honour of Mercy Amba Oduyoye* (New York, NY: Orbis Books, 2006), co-edited with Isabel Phiri, apart from winning an international award, was also awarded the 2006 UKZN Annual Book Prize for Best Edited Book. Prof. Nadar is an NRF-rated scholar, has co-edited

five books and published more than 30 articles in peer-reviewed journals and more than 15 chapters in books. She is an editor of the *Journal of Gender and Religion in Africa*, the only academic journal in Africa which focuses on the interface between gender and religion, and sits on several international journal editorial boards, including *Journal of Feminist Studies in Religion*, based at Harvard University in the US, as well as Women's Studies International Forum, based in the UK.



### Runner-up Prof. Hanri Mostert

Prof. Hanri Mostert's undergraduate studies in humanities and law at Stellenbosch University piqued her interest in the resource potential of land. Prof. Mostert's doctoral studies pursued the question of how land, as a scarce resource of great public importance, could be appropriately regulated, with simultaneous acknowledgement of private claims to it. Her appointments at Stellenbosch University (2001 and 2008) and the University of Cape Town (since 2008) allowed her to share her insights with

new generations of property law students. Prof. Mostert's work has had impact, both locally and internationally, through her appointment as a visiting professor at the Rijksuniversiteit Groningen in the Netherlands, her involvement in the International Alliance for Land Tenure and Administration and her work supporting the South African Law Commission, the World Bank and international and national litigation. She has addressed issues of constitutional property protection, landlessness, tenure security,

restitution, nationalisation, land governance and mineral resource regulation. Prof. Mostert has 40 publications and is writing a book series dealing with the mineral laws of Africa. She is also working on a series of opinion pieces on law with Juta Law Publishers.

Prof. Mostert holds a B-rating from the NRF and held fellowships of the Commonwealth Programme, the Max Planck Foundation, the German Academic Exchange Service and the Alexander Von Humboldt Foundation.



L'Oréal and UNESCO would like to congratulate the ten women who received the 2012 L'Oréal-UNESCO Regional Fellowships For Women in Science in Sub-Saharan Africa.

They each received US \$20,000 to complete their PhD studies.

For more information visit [www.forwomeninscience.com](http://www.forwomeninscience.com) or <http://anstigrants.unon.org>.





## Awards for the Development of Rural Women Established Researchers

### Winner Prof. Annamarie Kruger

Prof. Annamarie Kruger received her PhD in nutrition at the former University of Potchefstroom for Christian Higher Education (now North-West University) in 2001. She is currently the director of the Africa Unit for Transdisciplinary Health Research (AUTHeR) in the faculty of health sciences of North-West University. She is a trained and registered nurse (MSoc Sci in nursing, University of the Free State, and MSc in Diabetes Education, Glamorgan University, Wales). She holds a university certificate in Project Management and two certificates in Epidemiology. She has extensive experience in implementing and evaluating public health and nutrition intervention programmes. Her research focuses on the promotion of rural health, incorporating an understanding of the psycho-social factors that have an influence on health, and on finding

solutions for communities. An example is Lifeplan (Life Inequalities amongst Females addressed by means of Purposeful Living And Nutrition). Prof. Kruger and her team developed this human-capacity-building and empowerment programme by integrating the insights, knowledge and research outcomes from in-depth multidisciplinary research using a transdisciplinary approach. Lifeplan was initially designed to empower women, but it has proven effective for all members of households. It is also a prerequisite for everyone who wishes to get involved in the income-generating projects within her Flagh (Farm Labour And General Health) research programme (*flagh.co.za*).

Prof. Kruger was a founding member of the South African Higher Education Community Engagement Forum in 2009 and has been leading the working

group on research and community engagement ever since. She is internationally recognised, is a peer reviewer, has been published in more than 40 publications and presented her work in local and international journals and conferences. She is actively involved in the training of undergraduate and postgraduate students in sustainable community interventions. She is the principal investigator for the South African leg of the large prospective urban and rural epidemiology study across 18 developing countries and of the Sunray study (*sunrayafrica.co.za*), which includes all sub-Saharan African countries. She has received several awards for community engagement, including the Stals award from the South African Academy of Science and Arts for her contribution to research through multi and interdisciplinary team work in 2012.



### First runner-up Prof. Riana Bornman

Prof. Riana Bornman completed her degree in medicine at the University of Pretoria (UP) in 1973, a DSc at UP in 1983 and an MD at the former University of the Orange Free State in 1987.

She is currently Extraordinary Professor in Andrology in the Department of Urology at the Faculty of Health Sciences at UP.

From basic scientific research in human male reproductive health, her interest extended to animals and wildlife as biosentinel species to define the sequelae of environmental pollution and ultimately come up with strate-

gies to mitigate human health problems. Since 2002, her public health focus has been on health effects in malarial areas where insecticides, including DDT (a known endocrine disrupter and toxicant), are applied for mosquito vector control with inadvertent exposure of humans and the environment.

She has done extensive research in communities of the Vhembe district of Limpopo, using local VhaVenda women for training, recruitment and data collection. She is an NRF C1-rated researcher, a member of the UP Centre for Sustainable Malaria

Vector Control and served on several World Health Organisation (WHO) committees.

Findings on the various routes of DDT uptake after spraying were incorporated in the WHO DDT Health Risk Assessment (2011). She has compiled various reports for the Water Research Commission on endocrine disrupters, DDT and human and environmental health effects.

She has published in more than 114 local and international peer-reviewed journals and has presented her work at many local and international conferences.



### Second runner-up Dr Mercy Tshilidzi Mashamba

Dr Mercy Tshilidzi Mashamba completed her PhD in psychology at the University of Venda in 2010. She is currently the Head of the Department of Psychology and Vice Dean of the School of Health Sciences at the University of Venda.

Her PhD was on developing an HIV and Aids training manual for faith healers, and evaluating their HIV and Aids knowledge before and after training.

The training was done using the information-motivation-behav-

our skills model of STI/HIV risk behaviour change.

Dr Mashamba's research interest is health promotion, focusing on indigenous knowledge systems and HIV and Aids.

Her research promotes the contribution made by indigenous healers and advocates for collaboration between indigenous healers and Western health practitioners.

She also promotes voluntary counselling and testing and treat-

ment for sexually-transmitted infections and conducts skills-training for negotiating safer sex.

Her work has benefitted people - in particular women - in the rural areas of Limpopo. She has published nine research articles in local and international journals and co-edited one book.

Dr Mashamba serves as a reviewer for different journals and has an excellent record of awards, scholarships and research funding.



## Emerging Researchers

### Winner Dr Sindiso Mnisi Weeks

Dr Sindiso Mnisi Weeks completed her DPhil in Law in 2009 at the University of Oxford, where she was a Rhodes scholar, based at New College and the Centre for Socio-Legal Studies. She is a graduate of the University of Cape Town (UCT), from which she obtained a BA and LLB, both with distinction. Dr Mnisi Weeks is currently a senior researcher in the Law, Race and Gender Research Unit at UCT, working on the rural women's action-research project, which combines research and policy work on women, land and customary law. She is also a senior lecturer in UCT's Department of Private Law, where she co-teaches African Customary Law.

Her publication work spans customary law, women's rights, traditional institutions and the Constitution. Dr Mnisi Weeks has successfully supervised 17 post-graduate students at honours and

Master's level. Her publication record includes seven peer-reviewed journal articles, three book chapters and one technical report. Her main concerns have been with rural women's exclusion from law-making and decision-making practices in traditional communities, as well as their participation in national legislative processes. Using methods that include rural women's participation, she has publicly challenged these forms of exclusion and the implications they have for rural women's ability to attain social and economic security. Dr Mnisi Weeks's current research focuses on vernacular dispute resolution forums in South Africa, and she has been actively involved in the coordination and representation of the multi-sector resistance to the passing of the Traditional Courts Bill. Her experience includes policy work, public education and media publicity. As an emerging

researcher, her recognition at an international level is steadily growing. She has been invited to contribute to publications alongside senior academics abroad and to deliver one of the keynote addresses at an international conference in Brazil next year.

Dr Mnisi Weeks is a former clerk of the Deputy Chief Justice of the Constitutional Court of South Africa, Dikgang Moseneke. She has won the Ismail Mahomed South African Law Reform Commission Essay Competition, among other awards. She was named one of the *200 Young South Africans* (in the business and law category) by the *Mail & Guardian* in 2011, and she was part of the Law, Race and Gender research unit team that was awarded the Social Responsiveness Award by UCT in 2011.





## Women in Science Awards

## Advertorial

### Awards for the Development of Rural Women: Emerging Researchers

#### Firstrunner-up Dr Sengeziwe Sibeko

Dr Sengeziwe Sibeko is a specialist obstetrician and gynaecologist who obtained medical qualifications at the University of KwaZulu-Natal (UKZN) and Colleges of Medicine of South Africa. She received the prestigious Columbia University Southern African Fogarty Aids international training and research programme fellowship and completed her MSc in Epidemiology at Columbia University, New York, in 2009.

She is an Oxford Nuffield Medical

Fellow based at the Weatherall Institute of Molecular Medicine, John Radcliffe Hospital at Oxford University, United Kingdom, where she is registered for a PhD in HIV mucosal immunology of the female reproductive tract. Prior to Oxford, she worked as a clinician scientist based at the Centre for the Aids Programmes of Research in South Africa (Caprisa) at the Nelson R Mandela School of Medicine (UKZN), while employed as a consultant

gynaecologist at Mahatma Gandhi Hospital. At Caprisa she was part of the landmark and multi-award-winning study on tenofovir gel trial, and led the development and implementation of its contraceptive counselling curriculum in addition to designing all its clinical aspects.

Dr Sibeko has co-authored 16 peer-reviewed articles in publications, including *Science* and is a member of 11 scientific committees, including the World Health

Organisation's contraceptive and HIV task force. Dr Sibeko's research interests are in the betterment of women's health, especially in respect of the HIV/Aids epidemic. Her specific interests include understanding biological mechanisms responsible for increased HIV acquisition risk in women for the ultimate purpose of development of an effective HIV-preventive strategy in the form of either a microbicide or vaccine.



#### Second runner-up Dr Joyce Chitja



Dr Joyce Chitja holds a PhD in Food Security, an MSoc Sci in Community Resource Management and a BSc Agric in Horticultural Science. She is currently a lecturer at the University of KwaZulu-Natal (UKZN), a council member of the Agricultural Research Council and board member of the Agricultural Development Agency in KwaZulu-Natal. Her research areas include food security in relation to smallholder farmer market access and value chains, water-use security, rural livelihoods and vulnerability, gender and agriculture, organic farming production, and land-use security and reform. She served on the Umgungundlovu Further Education and Training College Council and on the KwaZulu-Natal Farmers Union Board, representing UKZN. Dr Chitja has been a visiting scholar at Cornell University in the United States of America and has presented her research findings and concluded study missions in Australia, Italy, California, Kenya and Brazil.

Dr Chitja has supervised 17 postgraduate students at Master's and honours level and her publication record includes seven peer-reviewed journal articles, three book chapters and one technical report. Her focus is on establishing a robust community engagement research approach and programme where student research questions and the research laboratory are embedded in the rural smallholder farming communities.

## UKZN WOMEN AT THE CUTTING-EDGE OF RESEARCH.



Prof Relebohile Moletsane



Prof Sarojini Nadar



Dr Sengeziwe Sibeko



Dr Joyce Chitja



Ms Manoko Seepe



Ms Bongiwe Ndlovu



We congratulate you all on being nominated as finalists in the Department of Science and Technology's Women in Science awards. You've done us proud.





## Women in Science Awards

## Advertorial

### DST Fellowships Doctoral Studies

#### Joyce Mwangama

Joyce Mwangama completed her BSc (Eng) and MSc (Eng) at the University of Cape Town (UCT) in 2008 and 2011, respectively. Mwangama is currently working towards her PhD degree in Electrical Engineering in the communications research group at the same institution. Her research is on the evolution of mobile broadband networks, including next-generation mobile networks and future internet architectures and technologies. Mwangama has published papers in local and international peer-reviewed conference proceedings. She also works for the Electrical Engineering Department

at UCT as a research and teaching assistant. She has run the Institute of Electrical and Electronic Engineers (IEEE) student branch at UCT and currently oversees all IEEE student activities in South Africa. Mwangama is also the pre-university activities coordinator for the Africa region, involved in initiatives to promote engineering and sciences to high school learners. Recently, Mwangama was named as a Google Anita Borg Scholar, which is awarded based on the strength of candidates' academic performance, leadership experience and demonstrated passion for computer science.



#### Gladwell Nganga

Gladwell Nganga obtained a BSc (Civil and Construction Engineering) at the University of Nairobi in 2009 and in 2012 an MSc (Engineering) in Civil Engineering from the University of Cape Town, where she recently commenced a PhD programme. Her interest lies in the field of construction materials, mainly concrete. Her doctoral research

is on cement, a main component in concrete. She will evaluate the properties and changes that have taken place in this product in a local and international context and explore how the clinker content can be reduced to produce more sustainable concrete. She attended a conference in Hong Kong in September 2011 to present a paper on her Master's research.



#### Manoko Seepe

Prudy Manoko Mashika Seepe is a PhD student in the Department of Occupational and Environmental Health in the Traditional Medicine Laboratory at the University of KwaZulu-Natal. She received her Master's degree in medical biochemistry at the Centre of Excellence for Brain and Tuberculosis Research at the University of Stellenbosch. Her research interest is in African traditional medicine and its possible efficacy against KwaZulu-Natal tuberculosis strains through good and strong relations built with local herbalists known to have

expertise in treating or managing tuberculosis using herbs. She believes it would be useful to use science to evaluate traditional medicines that may be of benefit in the fight against the disease. Seepe has presented a paper in her area of work at the 3rd South African Tuberculosis Conference, and received an award for her presentation at the Medical Research Council research day. She participated in the fourth Indigenous Knowledge Systems Expo, where she was involved in teaching learners the importance of science in indigenous knowledge research.



#### Bongiwe Ndlovu

Bongiwe Goodness Ndlovu received her Master of Medical Science (MMedSc) degree in pediatrics at the University of KwaZulu-Natal (UKZN) in 2012. Ndlovu is currently enrolled for a PhD in medical virology at the Doris Duke Medical Research Institute, Nelson R. Mandela School of Medicine, UKZN. She is a developmental lecturer in the School of Laboratory Medicine and Medical Sciences at the university. Ndlovu's research is on stopping HIV's spread among South African adults and mother-infant pairs, using both innate and adaptive immune mechanisms. Currently, she is focusing on the evolution of humoral immune responses in acute and early HIV-1 subtype C infections. Her aim is to determine the timing of emergence, patterns of breadth and specificity and to characterise the evolution of anti-HIV binding antibody subclasses, from the time of infection to three years post-infection. This information is required to develop novel strategies for



HIV vaccine development that exploit mechanisms of broadly neutralising antibodies. As a master's student, she found that the HLA-Cw\*04:01 allele was associated with susceptibility to mother-to-child acquisition of HIV infection. In 2010, she was awarded the TATA Africa Scholarship and a Columbia University-South African Forgarty Scholarship for training in HIV/Aids research. She recently published an article in a peer-reviewed journal.

#### Kim Potgieter

Kim Potgieter completed a BSc degree cum laude in 2008, an honours degree cum laude in 2009 and a Master's degree cum laude in 2010.

Potgieter is currently a third-year PhD chemistry student in the faculty of science at Nelson Mandela Metropolitan University (NMMU), specialising in inorganic chemistry.

Potgieter's research project entails the synthesis of a wide variety of 1,3-benzothiazole derivatives, with functional groups that will make them susceptible to coordination by rhenium.

The formulation of novel rhenium complexes with benzothiazole derivatives could potentially have therapeutic applications as a treatment for Alzheimer's disease, as well as for tumour radiotherapy. She was awarded the South African Chemical Institute's James Moir Medal Award for being the top BSc chemistry honours student in 2008 and the S2A3 Medal, for the most outstanding Master's dissertation (2010) in scientific disciplines, as

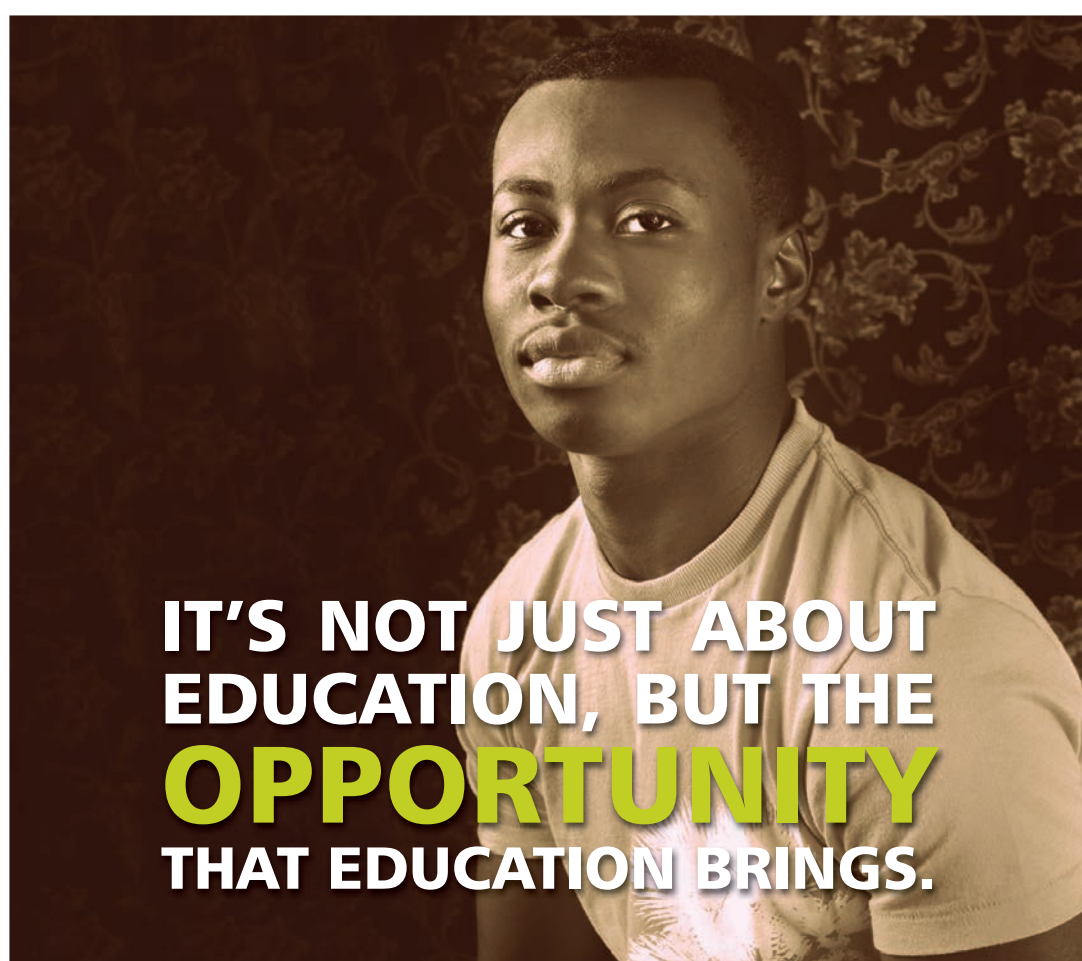


well as the 2011 Nelson Mandela Young Achievers Award in the academic category recognition of achievements by young people in the Nelson Mandela Bay Municipality.

Potgieter has published twelve articles in various international peer-reviewed journals and has presented her work in the form of poster and oral presentations at local and international conferences.

#### Toni-Lee Sterley

Toni-Lee Sterley completed a BSc in Mathematics and Physiology, followed by a BSc (Med) honours degree in Physiology, specialising in Neuroscience, at the University of Cape Town. She began her Master's in neuroscience in 2010 under the supervision of Prof. Vivienne Russell and co-supervised by Dr Fleur Howells, and upgraded her project to a PhD at the beginning of 2011. Sterley's current research is on the neurobiology of attention-deficit hyperactivity disorder (ADHD) and depression/anxiety disorder. She is specifically focusing on how norepinephrine, a neurotransmitter that is implicated in these disorders, is regulated by the major excitatory and inhibitory neurotransmitters in the brain (glutamate and GABA, respectively), and whether this regulation is different in the case of ADHD and depression/anxiety disorder. She is also investigating how early life trauma interacts with the inherited neurochemistry and/or behavioural profile of ADHD and depression/anxiety disorder. She has presented her research at a number of local and international conferences, published two papers, and has received a number of awards in her academic career.



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THAT EDUCATION BRINGS.





## Women in Science Awards

## Advertorial

### DST Fellowships Master's Studies

#### Matsopiane Maserumule

Matsopiane Charlotte Maserumule is currently in her second year of MSc (Medicine) study at the University of Cape Town, conducting her research in the CSIR Biosciences section.

Her research interests are molecular biology, nanotechnology and biophotonics and their applications in health. Her MSc is based on developing aptamers (loosely defined as "synthetic/chemical antibodies") that detect tuberculosis antigens into more specific and affordable tuberculosis detection probes for the potential development of a point-of-care tuberculosis diagnostic tool.

Maserumule was awarded the KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH) Collaborative Grants Programme, a student-support grant award for her Master's study proposal.

Part of her Master's work has earned her a listing as an inventor in a provisional patent. In addition, there is at least one manuscript under preparation for publication from this work, with one co-authored manuscript already submitted.

Upon completing her Master's, Maserumule plans to undertake a PhD and subsequently establish a career that will integrate science and technology with industry to produce tangible solutions with real life-improving benefits and socioeconomic impact.



#### Lombe Mutale

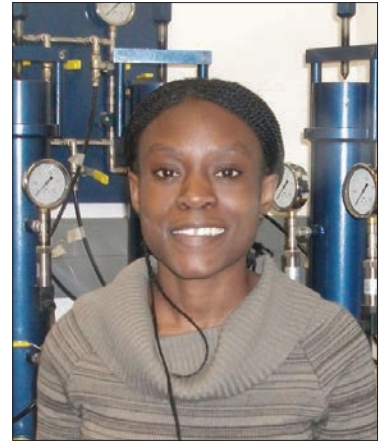
Lombe Mutale completed her BSc in civil engineering in 2011 at the University of Cape Town. She is currently starting a career in research and studying for an MSc in civil engineering at the same institution.

She graduated with honours, was on the Dean's Merit list and was the recipient of the 2011 Steel Design prize, awarded by the Southern African Institute of Steel Construction for the best structural steel design submitted by an undergraduate student.

She is a member of the Golden Key International Honour Society, exclusive to the top 15% of students at a university.

Mutale's undergraduate thesis was on the exploitation of symmetry in structural analysis.

She works with the world-



renowned Concrete Materials and Structural Integrity Research Unit. Her current research on chloride ingress resistance and performance-based design methods for concrete structures is expected to contribute to more durable and sustainable infrastructure.

#### Sindisiwe Nondaba

Sindisiwe Nondaba is a first year MSc student at the University of Pretoria, under the supervision of Professor Debra Meyer. Her field of study is biotechnology with specialisation in biochemistry.

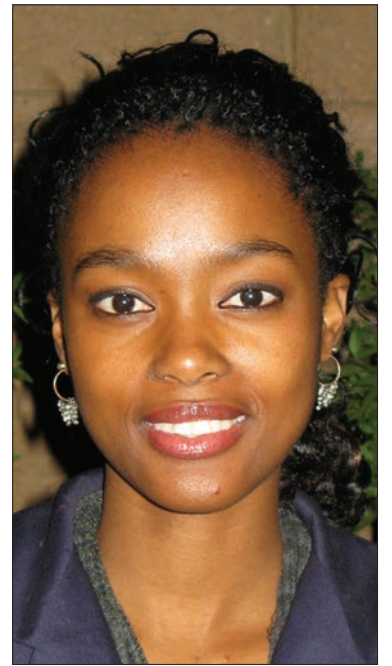
She is conducting research in the area of HIV/Aids, mainly on HIV-1 subtype C because it is the dominant subtype in South Africa and accounts for most of the global HIV-1 epidemic.

Her project entails investigating host and virus-derived synthetic peptides to ascertain their potential as therapeutic tools. The HIV research group has a unique approach to HIV/Aids research and education; involving multidisciplinary collaborations and the use of a combination of biochemistry, analytical chemistry and physics to get more reproducible data.

Preliminary data produced by Nondaba suggests an association between disease progression and the presence of antibodies elicited to the aforementioned synthetic peptides, early in infection.

Her work has also shown that the peptides are not toxic to cells. Although it is still early, Nondaba has already made progress towards achieving the objectives of her study.

It is possible that data from



this project may necessitate that we consider re-evaluating and expanding current HIV diagnostic and prognostic technology in favour of methodologies that provide more information on disease status.

Following completion of an MSc, Nondaba wishes to pursue a doctorate in biotechnology and aspires to be one of the top female scientists in this country.

#### Akhona Vava

Akhona Vava is currently studying towards an MSc in Medicine, specialising in medical biochemistry.

She holds a BSc degree in Biochemistry and a BSc (Med) Honours degree from the University of Cape Town, the latter completed with an average of 72%.

Her current research investigates the role of DCUN1D1 protein in the development and progression of prostate and oesophageal cancer, in the pursuit of identifying novel targets for anti-cancer drugs that can be used in cancer treatment.

The study ties in with her research interests as it involves the study of cancers that are highly prevalent in South Africa; oesophageal cancer is one of the leading cancers in South African and prostate cancer is the most prevalent cancer in South African men.

She was placed on the Dean's Merit list in 2009 and 2010 and was recently invited to be part of the Golden Key International Honour Society, which comprises the top 15% of academic achievers at universities.



## Celebrating women in science

As a leading research-intensive university in Africa, the **University of Pretoria** celebrates and recognises its finalists for the **Women in Science Awards**. Their achievements demonstrate not only the excellence and relevance of their own research, but also the increasing impact of knowledge generated by women.



**Prof Liesel Ebersöhn**  
Faculty of Education



**Prof Riana Bornman**  
Faculty of Health Sciences



**Ms Sindisiwe Nondaba**  
Faculty of Natural and  
Agricultural Sciences

**Congratulations to Prof Liesel Ebersöhn, Prof Riana Bornman  
and Ms Sindisiwe Nondaba.**



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## Women in Science Awards

**Advertorial**

### DST Fellowships Master's Studies

#### Sumaiyya Thawer



Sumaiyya Thawer graduated from the University of Cape Town with a BSc degree in 2010 with distinctions in microbiology, genetics and physiology. She was top student in microbial biotechnology in her graduating class and completed a BSc(Med) Honours degree with distinction in infectious diseases and immunology in 2011.

She is currently pursuing a Master's degree at UCT in immunology under the mentorship and supervision of Dr William Horsnell and Prof. Frank

Brombacher.

Her research is focused on characterising the role of innate immune cells, specifically macrophages, in recall immunity to helminth (worm) infections. Parasitic helminth infections are one of the neglected tropical diseases that serve as a major global health problem.

Detailed understanding of host immunity to helminthes is therefore likely to be critical to future vaccine design.

#### Narjis Thawer



Narjis Thawer is a young African scientist, training in medical research to tackle the huge burden of infectious diseases in Africa. She obtained her BSc degree at the University of Cape Town (UCT) and graduated with distinctions in genetics, physiology and microbiology in 2010.

She was the best student in her molecular microbial genetics course and in 2011 completed a BSc (Med) Honours degree in Immunology and Infectious Disease at UCT Medical School. She is currently pursuing an MSc in the Department of Medical Virology in the Health Science Faculty

at UCT. She focuses on HIV and tuberculosis, and in particular people who are infected with both diseases. South Africa is particularly hard hit: it has both one of the highest numbers of HIV-infected people in the world and one of the highest tuberculosis infection rates. Women are especially burdened with these diseases, and women in rural areas are often affected the most, owing to poverty and lack of access to health services. Thawer's research project investigates how HIV affects the immune response to the tuberculosis bacterium to determine why HIV-infected

people are more susceptible to tuberculosis, with the ultimate goal of helping to develop better vaccines and drugs to treat tuberculosis.

#### CREDITS

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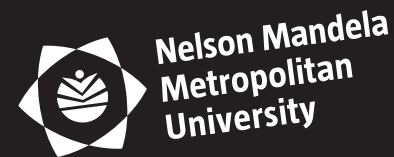
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# Women in science



**At Nelson Mandela Metropolitan University our scientists, many of whom are women, are working hard in various areas of research, but especially:**

- ▶ Sustainable local economic development
- ▶ Cyber citizenship
- ▶ Manufacturing technology and engineering
- ▶ Nanoscale characterisation and development of strategic materials
- ▶ Strategic energy technologies
- ▶ Sustainable human settlements
- ▶ Coastal marine and shallow water ecosystems
- ▶ Humanising pedagogies
- ▶ Democratisation, conflict and poverty
- ▶ Biodiversity conservation and restoration
- ▶ Health and wellbeing
- ▶ Earth stewardship



**Dr Sharlene Govender** has initiated collaborative research with hospitals, clinics and the National Health Science Laboratory Services that focuses on the distribution, control and detection and antibiotic resistance of TB, sexually-transmitted and hospital-acquired bacterial infections. Her research will hopefully lead to better treatment strategies for all involved.



**Prof Darelle van Greunen** uses her Information Technology research to seek innovative solutions for solving problems in under-serviced and rural areas. For example, she works closely with the health profession to make access to medical information easier, especially to those who are far from hospitals and clinics.



**Ms Kim Potgieter** specialises in the field of inorganic chemistry. Her research project involves the formulation of novel rhenium compounds containing benzothiazole derivatives for use as potential therapeutic agents for Alzheimer's disease, as well as tumour radiotherapy. In short, it will have significance in the development of novel radiopharmaceuticals.



**Dr Nobom Hashe** is one of few South African women conducting cutting edge research in the field of nanoscience – analysing materials at an atomic level. Nobom specialises in the hard materials used for drilling or to make car parts, seeking solutions on how to improve the metals.

For more information contact: Prof Thoko Mayekiso, Deputy Vice-Chancellor: Research and Engagement  
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[www.nmmu.ac.za/science](http://www.nmmu.ac.za/science)