

MORE THAN JUST SCHOLARSHIPS ...

DAAD In-Country / In-Region Funding in South Africa



UNIVERSITY CENTRE

A photograph of a university entrance. The building has a grey facade with a classical-style pediment and columns. Above the entrance, the words "UNIVERSITY CENTRE" are engraved in large, dark letters. Above the text is a logo featuring a classical building with three columns and three decorative elements above it. The entrance is a glass door with a black frame. A group of five young people, likely students, are standing on a set of yellow-painted concrete steps leading up to the entrance. They are dressed in casual attire. The scene is brightly lit, suggesting daytime.

DAAD

Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

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Editorial

The In-Country/In-Region Programme for South Africa

Dear Readers,

At the DAAD, South Africa has long been a focus area. Even during the apartheid era, we funded underprivileged students at the country's own universities by granting so-called "In-Country Scholarships" in order to offset this discrimination to some extent, to open up new opportunities and to support change from within.

Just what an impact this kind of scholarship can have on an entire academic career is described by Sumita Ramgareeb in this brochure. In the late 1980s, it was by no means a matter of course for a woman of Indian descent to go to university. Encouraged by the support she received, Ramgareeb made her way and now heads the leading research programme at the prestigious South African Sugarcane Research Institute. "Development is not a matter of millions," says DAAD scholarship holder Grey Magaiza. The sociologist is working on his doctorate with ten school-leavers from one of the poorest provinces in South Africa, developing practical approaches to address poverty. People like him and Sumita Ramgareeb are the motivators and multipliers who are driving the development of African countries. And they are still urgently needed!

With funds from the Federal Ministry for Economic Cooperation and Development (BMZ), the DAAD thus still supports 100 new Master's and PhD scholarship holders in South Africa every year. It also provides numerous scholarships for postgraduates from other African countries, enabling them to continue their studies at a centre of excellence like the Centre for Human Rights in Pretoria or the African Institute for Mathematical Sciences in Cape Town.

The programme has gained a new dimension as a result of cooperation with the South African National Research Foundation (NRF). Since 2010, both organisations have announced, organised and financed the DAAD-NRF Joint Scholarship Programme with the aim of continuing to promote highly-gifted, underprivileged students. This approach makes an active contribution to equal opportunities while ensuring that the programme is tailored to South Africa's current needs.

The DAAD's role in creating a new generation for German-South African research collaboration through this initiative has been clearly re-affirmed by the German-South African Year of Science 2012/2013. The seven topics for the year are Astronomy, Bioeconomy, Humanities and Social Sciences, Human Capital Development, Health Innovation, Climate Change and Urbanisation. And these topics are also reflected in the projects conducted by the DAAD scholarship holders, revealing the extent to which these young academics are committed to championing their country and their region.

This brochure features scholarship holders and alumni as well as partners who have been instrumental in making this scholarship programme so successful. I hope you will enjoy reading about it!

Dr. Helmuth Blumbach
Head of the Southern Hemisphere Department, DAAD

More than just Scholarships ...

DAAD In-Country/In-Region Funding in South Africa

The programme

The DAAD launched its activities in South Africa in 1981, when apartheid was still in force. Under the special Southern Africa Programme, students received scholarships to enable them to enrol at either a local university or one located in one of the South African provinces. The objective was to enhance educational opportunities for members of as many sections of the population as possible. Initially, the programme focussed on training and continuing education for teachers.

Originally financed by the Federal Foreign Office, the programme was taken over by the Federal Ministry for Economic Cooperation and Development (BMZ) in 1997, and integrated into the In-Country/In-Region Programme. To achieve the main funding goal of training young African academics, two funding lines were developed: scholarships for Master's or PhD study at home (In-Country) and scholarships for Master's or PhD study at a recognised centre of excellence in a third African country (In-Region).

Today, the DAAD offers in-country scholarships in eleven countries in Sub-Saharan Africa. It also maintains partnerships with 19 centres of excellence in various countries which host in-region scholarship holders. In the academic year 2012/13, 220 in-country and 100 in-region scholarships were offered, attracting 1,000 applications from young African academics. A total of 900 scholarship holders are currently receiving support in 2013.

Partner country: South Africa

Support at home or in the region is the focus of the DAAD's cooperation with South Africa.

Five of the 19 centres of excellence are located in South Africa. Master's and PhD candidates can acquire their qualifications in Mathematics and the Natural Sciences, Paediatrics, Forced Migration and Human Rights. South Africa is thus the most popular destination for in-region support. At the Centre for Human Rights in Pretoria alone there are scholarship holders from more than 20 different countries in Sub-Saharan Africa.

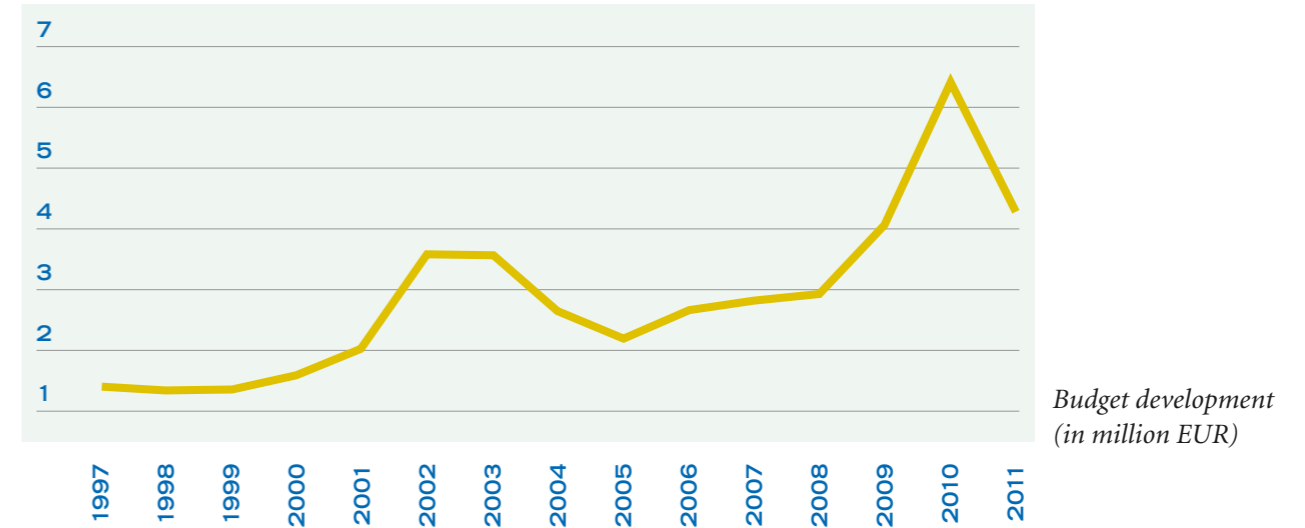
South Africa also hosts scholarship holders from Namibia. The in-country programme for Namibia is the only one to include an in-region option. Approximately half of all Namibian scholarship holders make use of this option, selecting in particular medicine and engineering, not least because they are not offered everywhere in their own country.

In 2010, the DAAD restructured and extended its in-country scholarship portfolio for South Africa: 100 scholarships are now awarded annually (50 Master's, 50 PhD) and the funding provisions place them on a competitive level. The programme is financed equally by the DAAD, with funding from BMZ, and the National Research Foundation (NRF). This area of the programme alone demonstrates the spirit of partnership driving academic cooperation with South Africa, which is currently at an all-time high thanks to the joint DAAD-NRF programme.

Every year, scholarship holders gather for a meeting which, in addition to networking opportunities, includes a workshop on professional and academic career development. In terms of field of study, the South African in-country scholarships focus primarily on the biosciences, which – as shown in the portraits of the scholarship holders – are applied throughout the region.

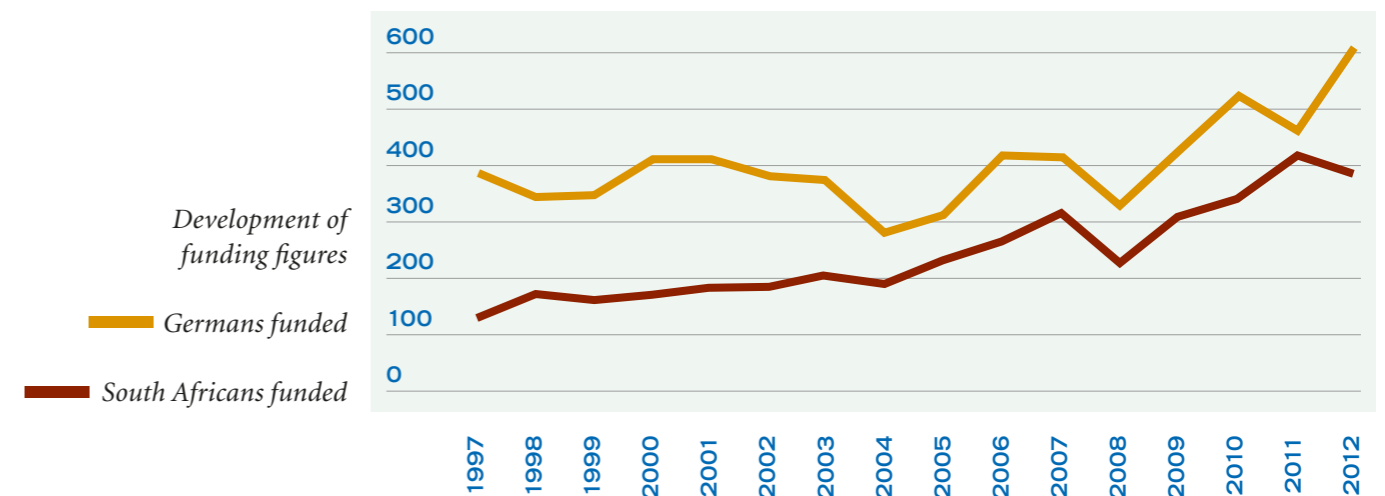
Appeal of universities

For years, South Africa has been becoming an ever more attractive destination for German students, doctoral candidates and academics. In addition, an increasing number of South African and German universities have established stable partnerships, in some cases involving institutions in other countries. Here, too, the DAAD provides support in the form of new programmes, which are funded under the BMZ's development cooperation funding priority, and under the research and teaching funding priority of the Federal Ministry of Education and Research (BMFB).



In 2009, the South African-German Centre of Excellence for Development Research and Criminal Justice was established in Cape Town. The partners are Ruhr-Universität Bochum and Humboldt-Universität zu Berlin. The “dual centre” offers Master's and PhD courses in development

research/policy and criminal justice. It is part of the “Aktion Africa” campaign run by the Federal Foreign Office, which seeks to restructure and promote the culture and education sector on the basis of collaborative partnership.





Featured Locations

In the pages that follow, you will visit the most varied locations where scholarship holders and alumni are studying, researching and teaching – hear their extraordinary stories and learn about their exciting projects.



3 questions for Albert van Jaarsveld

CEO of the National
Research Foundation (NRF)



Albert S. van Jaarsveld has been Chief Executive Officer of the National Research Foundation since 2009.

1 NRF wants South Africa to become a global player in the knowledge economy. How do you intend to achieve that aim?

To transform the South African science system there are two things we have to achieve. The first is to scale the system up to a point where it really becomes globally competitive. South Africa has about one percent of the world's population so it should have at least the same level of global research and development output. We are currently at 0.56 percent, so we still have a long way to go, but our aim is to reach one percent, to ensure we are punching above our weight. To reach it, we have to put an emphasis on the production of PhDs as a scientific workforce that can drive us forward. From about 1,200 PhDs in 2007, we are now up to 1,500 per year and are pursuing a further five-fold increase by 2020. Looking at the history of our nation, the second component of the transformation is the ongoing challenge to include more and more people from under-represented sections of South African society. In order to develop and retain high-end scientists in the country and attract some of the best from around the world, we are also putting a lot of resources and efforts into high-end scientific infrastructure in areas in which we have a competitive advantage, like astronomy, palaeontology and Southern Oceans-Antarctic research.

2 How does the DAAD support NRF's endeavours?

We have numerous international partnerships, but I can say that our relationship with the DAAD is probably the most influential. This is not only true in terms of the students who are supported within South Africa, or those that are able to go to Germany for research, but also because Germany has been a long-standing strategic partner for many years. We have too few PhDs in our science system to supervise the growing number of PhD students we envisage, so Germany is providing many high-end researchers as supervisors. In addition to that, the in-country scholarships, which have gone up from 30 to over 100 students per year, allow students to do their PhDs within South Africa and thus contribute to increasing our own supervising capacity. That is one of the most important benefits of the long relationship with the DAAD. The partnership has grown from support for training into a truly very active exchange of mature scientists.

3 The In-Country Scholarship Programme also facilitates research stays in Germany. How can junior scientists benefit?

They come back as much richer individuals who have gained an international network. This often forms the basis of their academic research careers, enriches their science and also our system. Germany has broad expertise in many disciplines which are interesting for South African scientists. The engagement of South Africans across those disciplines is already strong, but the German-South African Year of Science has strengthened many of the existing relationships and created many new opportunities and linkages.

The South African National Research Foundation (NRF) is an independent government agency which was established in 1998 to strengthen South African research and innovation through funding, human capital development, providing research facilities and building international scientific collaborations. Since 2010, NRF has provided in-country-scholarships for Master's and PhD students in South Africa in cooperation with the DAAD.

From Cashew Apples to Biofuel

Basic research on a new renewable

Biologist Evanie Deenanath wants to use the previously unused juice of cashew apples to produce bioethanol. She aims to transform a waste product into a source of sustainable mobility in Africa.

At the moment, it is still all happening in the lab: Evanie Deenanath ferments the juice of the cashew apple to produce bioethanol, which she then combines with conventional petrol to create ethanol fuel. It is the subject of her doctoral thesis at the University of the Witwatersrand in Johannesburg and – so she hopes – will also help to promote more sustainable mobility on the entire continent. “Biofuels are not very common in Africa yet. The industry is extremely conservative and still campaigns for traditional resources,” explains Deenanath. “I want my research to draw attention to the enormous potential of cashew apples as a renewable resource.”

Cashew fruit is cultivated in many parts of Africa to produce the ever-popular cashew nut. In South Africa the main areas of cultivation are on the Mozambique border. However, at present, producers hardly make any use of the cashew apple, the large, swollen fruit of the cashew tree, from which the cashew nut hangs. “They're used to make jam, wine and ice cream, but otherwise most of the fruit is thrown away,” says Evanie Deenanath, who discovered the valuable waste product when she was doing a brewery project at university.

Just one large cashew plantation in South Africa produces some 380 tonnes of waste cashew apples every year. Evanie Deenanath discovered that the juice is excellent for producing bioethanol. “The complexity of the juice supported yeast growth during the fermentation process very well. I was able to produce a high concentration of ethanol,” she says, summing up her results. “But you would have to concentrate production on the short period from January to March because this is when the fruit is ripe.”

With an eye on food security

Bioethanol plants already existed in South Africa back in the 1990s, mostly processing maize and sugarcane for biofuels. But they were soon closed down, because the raw materials were needed for human food consumption. “Using cashew apples for biofuel is not a food security issue in Africa,” the DAAD-NRF scholarship holder notes. She has just submitted her doctoral thesis and is hoping

a South African company will recognise the potential of this easily-accessible resource; she wants to test bioethanol production on a larger scale and make it commercially viable. A research stay or postdoc position in Germany would also interest her. “Research on biofuels in Germany is much more advanced than it is here. It would be a great opportunity,” says the biologist. Whatever happens, sooner or later she would like to return to university to pass on her knowledge to others and train the next generation of South African scientists working on sustainable biofuels.



The Ape Cape

Studying baboons and informing people

Matthew Lewis investigates the foraging behaviour of baboon troops that search for mussels and limpets on the coast of the Cape Peninsula. The zoologist wants to discover how important marine food resources are to the animals and help protect their habitats.

When the tide is out they make their way down to the beach and search for mussels and limpets amongst the sharp rocks, biting them open with their teeth and nibbling out the pale flesh. Sometimes they find shark eggs floating in the seaweed. Baboons are known for eating insects and small mammals as well as plants. Here, on the Cape Peninsula of South Africa, they have discovered the feeding opportunities offered by the marine intertidal zone. "The local terrestrial plant life doesn't provide nutrient-rich food, so they supplement their diet with an extremely protein-rich marine resource," says Matthew Lewis, a zoologist at the University of Cape Town. Wearing climbing boots and a windproof jacket he surveys the coast-

of baboons is moving through the undergrowth. "They've probably spent the morning foraging along the coast."

Lewis wants to find out what role marine food resources play for the baboon troops on the Cape Peninsula. In his lab at the University of Cape Town, he cuts the hair samples into sections, two to three millimetres long, corresponding to the specific phases of growth and examines them for stable isotopes. He compares the results with the reference values from the food samples in order to determine the proportion of food types ingested during a certain period of time. Faeces samples provide additional information



line to the south. The sun and sea spray have bathed the scene in a glistening shimmer.

Food, faeces and fur

The hinterland of the Cape of Good Hope, most of which belongs to Table Mountain National Park, is where Lewis conducts his research. He has spent weeks and months here, following the baboons from sleeping site to sleeping site to observe their foraging behaviour for his doctoral thesis. He takes samples of their food, faeces and hair to examine in the lab. Using a blowgun, he projects sticky little blunt darts into their fur and waits until the animals rip them off – along with a tuft of hair. "It wasn't easy to get the samples we needed. They soon caught on to what I was trying to do," explains Lewis. Near the beach the bushes start quivering; a troop

of baboons is moving through the undergrowth. "They've probably spent the morning foraging along the coast." Lewis wants to find out what role marine food resources play for the baboon troops on the Cape Peninsula. In his lab at the University of Cape Town, he cuts the hair samples into sections, two to three millimetres long, corresponding to the specific phases of growth and examines them for stable isotopes. He compares the results with the reference values from the food samples in order to determine the proportion of food types ingested during a certain period of time. Faeces samples provide additional information

Amusing pest

Lewis also has another objective on his research agenda: he wants to protect the animals. Many people in South Africa find baboons cute and amusing, others consider them a pest. Farmers kill them by the hundreds. "We scientists try to steer a middle course. We love the animals but we know they cause a lot of damage and can be dangerous for people." Unlike the baboons in the rest of the country,



»South Africa has very distinguished biology departments and incredible natural resources. It's a good place to research all sorts of aspects of biology.«

those living on the Cape Peninsula have been protected since the 1990s, and so numbers have increased from under 300 to almost 500. But even here they often become involved in conflicts with people, especially on the outskirts of residential areas and in tourist car parks. Baboons have learned to break windows and open cars. There are warning signs and "baboon monitors" who are supposed to follow the troops living near the residential areas and prevent clashes. "When they are fed, they get used to people and start going into housing areas to steal food," says Lewis. He hopes that his research results will help to avoid conflicts and improve the protection of the baboons' habitat on the Cape Peninsula. "The human population is increasing and more of the coastal strips are being developed. This could have a big impact on their behaviour," he says. "Conservationists and the authorities have to be told how important marine food resources are for the baboons – the more information we give them, the better they'll be able to do their jobs."

Lewis himself could well imagine working for the national parks authority or a conservation organisation for some time to get things moving. But he is also drawn to an academic career for which he would be excellently qualified: three years ago, he was granted a DAAD in-country scholarship for his Master's degree, but his supervisor soon encouraged him to skip the Master's. He increased the scope of his research project with the support of an DAAD-NRF scholarship and embarked on a doctorate which he will complete in 2013. After that, he intends to apply for postdoctoral funding in order to continue his research in an international context and perhaps be able to apply his combined method of behavioural observation and isotope analysis to other species.



Against Injustice, Oppression and Corruption

An advisor in the first Mandela government

On 11 February 1990, a new era began in South Africa: after 27 years in prison, Nelson Mandela was released. On this very day, South African lawyer Lovell Fernandez returned home from Germany to take up a lectureship in law in Cape Town. In the following years, he and his colleagues restructured the South African legal system.

“As lawyers it is our duty to ensure that everyone has access to justice, especially those who have been oppressed and excluded,” says Lovell Fernandez, describing his understanding of his own role. This is what the former DAAD scholarship holder has always campaigned for – in very different places and by very different means.

The injustice of the apartheid regime soon sparked the idea of studying law when he was still in high school. But because Fernandez was classified as “coloured”, he could not study at a university near his home town, Vereeniging, but had to enrol for Law at the University of the Western Cape

(UWC), which the apartheid government had designated for coloured students only. “UWC students took a strong and active stand against apartheid. The university thus became known as the ‘intellectual home of the Left’”, says Fernandez. He received a scholarship to do an LLM in comparative law in the United States where he met the famous psychoanalysts Alexander and Margarethe Mitscherlich. They encouraged him to take a doctorate in Germany. “So in 1978, I became a DAAD scholarship holder in Hamburg and found a new home at the university and at the Max Planck Institute for Comparative and International Private Law.”

Commitment to human rights

The young South African was in the right place at the right time – at the end of the 1970's, the Max Planck Institute specialised in comparative international law research. In his dissertation he compared legal aid – then known as the “poor law” – in Germany and South Africa. “I was always interested in the theory and practice of law, and a political dimension was also important to me.” But Fernandez realised that he would not be able to practise law in his own country. Now married to a German, he surveyed the scene in Hamburg and started working for Amnesty International, a calling that corresponded with his committed understanding of the law. “I was responsible for South Africa and went to schools, police academies and political party meetings. It was the period of the ‘Don’t buy the fruits of apartheid’ boycott, which had been initiated by the church, and which I supported,” he recalls. Even though he was in Germany, Fernandez worked for change in his country. Consequently, he did not hesitate when the newly-established Hamburg Foundation for Politically Persecuted People offered him a job. His function there was to organise events for politically persecuted journalists, writers and artists who had come to Hamburg on a grant from the foundation.

11 February 1990: A day of destiny

Then the letter arrived from South Africa. “Friends wrote to tell me things were changing and I finally wanted to go back and make use of my expertise. Lawyers were desperately needed.” On 11 February 1990, Lovell landed in South Africa and witnessed Nelson Mandela’s release from prison. And so began some exciting years. He taught law at his former university, UWC, which was still as much a hub of political activity as it had been under apartheid. “The Faculty of Law played a leading role in formulating the new constitution. The law governing the Truth and Reconciliation Commission was born here, and some colleagues were invited to join Nelson Mandela’s cabinet,” explains the 63 year-old, describing the period of upheaval. He, too, was one of those who swapped the campus in Cape Town for an office in Pretoria. In 1996, Lovell Fernandez became an advisor in the Ministry of Justice for two years. “Our challenge was to develop a plan of action to implement a justice system that reflected the wants of the majority of the population, one which is based on the principles of a *Rechtsstaat*, a state built on the rule of law. We succeeded in implementing a number of radical changes for the better.”

»It is our duty to ensure that everyone has access to justice, especially those who have been oppressed and excluded.«

Centre of excellence for African lawyers

Lovell Fernandez always had one goal in mind: to facilitate access to the system of justice for disadvantaged people. “We enforced a regulation allowing laypeople to become assessors at criminal trials, extended legal aid enormously and set up citizens’ advice desks in Magistrates’ Courts to make the workings of the courts more understandable for ordinary people, so that they could develop trust in the administration of justice, especially criminal justice.”

Back at university, the committed lawyer activated his contacts in Germany to initiate close cooperation with Humboldt-Universität zu Berlin. “We discussed similar topics, such as how young democracies undergoing transition could deal with gross human rights violations perpetrated under past oppressive regimes, a topic we now define as ‘Transitional Justice.’” Having become a professor of criminal law at UWC in 1995, Fernandez pursued another of his goals: to train lawyers for key positions in South Africa and other countries on the continent.

Since 2008, Lovell has been working with the South African-German Centre for Development Research and Criminal Justice, where he co-directs, together with his colleague Gerhard Werle from Humboldt-Universität zu Berlin, the Transitional Criminal Justice and Crime Prevention Division. The centre, financed by the DAAD with funds from the Federal Foreign Office, is maintained by UWC, Ruhr-Universität Bochum and Humboldt-Universität zu Berlin, and offers, among other things, Master’s and PhD programmes for African lawyers. “We would like to see African criminal justice systems respond more effectively to the challenges facing the African continent. This is why our Master’s courses focus on transitional justice, international criminal law, international anti-corruption law and international anti-money laundering law. Our graduates go on to assume or are promoted to key positions in the justice systems of their respective countries, with some heading up anti-corruption units.”

The Worm Tamer

Nematodes – an environmentally-friendly pesticide

In a lab at Stellenbosch University, Tia Ferreira breeds minuscule roundworms. They are destined to combat pests in the orchards and vineyards of the Cape.

The future, as Tia Ferreira sees it, is under a microscope. The thousands of wiggly items to be seen in the cadaver of a moth larva are supposed to help farmers and vintners fight pests. They are tiny roundworms, nematodes with the Latin names *Heterorhabditis zealandica* and *Steinernema yirgalemense*, which reach a length of just one to two millimetres when fully grown. “They reproduce until all the nutrients are used up and then I harvest them,” says Ferreira. She is sitting in her lab in the Department of Conservation Ecology and Entomology at Stellenbosch University observing the coming generation of pest eaters. She can breed as many as 1.5 million worms in a single larva. They are stored in water and can be sprayed in orchards and vineyards using standard spraying equipment.

the parasites. Within a few months, the nematode population is reduced by natural causes. “In this way, we create a balanced ecosystem which keeps the soil and other natural pest enemies alive.”

The 28 year-old’s interest in roundworms goes right back to her days as an undergraduate. In her subsequent Master’s thesis she investigated how effectively they can be employed to control the banded fruit weevil – *Phlyctinus callosus*. “It eats its way through the fruit which then can’t be exported,” she explains. “We’ve achieved very good results in our tests. The nematodes kill the banded fruit weevils while they are still at the larval stage before they can do any damage.”



Roundworms versus banded fruit weevils

“I’m fascinated by the fact that you can make an effective pesticide out of little worms, and it’s even environmentally friendly,” the biologist explains. “Chemical pesticides don’t only kill the pests but all the other organisms in the soil as well. But nematodes occur naturally in the soil, we just up their numbers.” The nematodes penetrate the pests and secrete bacteria that poison the host but feed

In her doctoral thesis, which is being supported by the DAAD and NRE, the South African has continued her research on developing a marketable pesticide based on the tiny worms to target codling moth (*Cydia pomonella*) and mealybugs (*Pseudococcidae*), a product of particular interest to farmers, especially in South Africa’s burgeoning organic farming industry. Tia Ferreira is working on a method for breeding even larger numbers of round-



The Stellenbosch wine region: imposing mountains and fruitful valleys

worms. Instead of using an insect larva, she rears the nematodes in a nutrient solution with bacteria, harvests them in a microsieve and stores them in water or a clay powder that can easily be dissolved before spraying. The way is free for commercial exploitation.

Science and industry cooperating on research

It is no coincidence that the University of Stellenbosch is a national leader in nematology – it lies right in the middle of one of the most important stretches of cultivated land in South Africa. Here, just a few miles east of Cape Town, the fertile valleys produce nectarines, pears, vegetables and grapes. And this is also where big fruit-growing companies and vineyards have their land. “Industry is very interested in finding new, eco-friendly ways of protecting yields,” the young scientist comments.

Consequently, the subject of her doctoral thesis was agreed upon with a number of companies which are also partly financing her research work. Every fruit exporter in South Africa pays a research levy on each container, so enough

money is available. “We have several representatives of industry in our department who discuss their research needs with us. They also have an overview of which pests the farmers are currently having to deal with and which ones have become resistant to pesticides,” says Ferreira, describing the cooperation between science and industry. “For my research it was really useful to be able to share information with practitioners, try out new ideas and be involved in developing a product that is actually used.”

For the period after her doctorate, Ferreira has already signed a contract with a regional company that wants to commercialise her work and establish a new line of business based on the roundworm. She will be responsible for breeding and rearing whole armies of minuscule pest eaters.



3 questions for Jo Wilmshurst

Chair of the African Paediatric Fellowship Programme (APFP)



Jo Wilmshurst is the head of Paediatric Neurology at the Red Cross Children's Hospital; in late 2008, she was appointed chair of the African Paediatric Fellowship Programme (APFP).

1 How is the APFP trying to improve child care in Africa?
We are working with universities from all over the continent. They identify which skills in paediatric health care are needed in the country and select doctors for training at our hospital. Usually, it is a two-year programme. We have already run multiple training courses with six African countries and generated enough capacity amongst doctors to see a shift in paediatric health care and even policymaking. In Malawi, the training programme is so well established that they themselves have started to train a doctor from Sierra Leone who will transfer to our centre after two years of basic general paediatric training. In this way, we are hoping to gradually build solid training hubs across the continent.

2 Why is paediatric care so important for Africa?
Around 40 percent of the population on the continent are children, but the resources for them are poor, the number of paediatricians is way below WHO guidelines – it is absolutely appalling! Common causes of death are respiratory diseases, diarrhoea, malnutrition and infectious diseases like malaria, TB, and HIV. A study performed in rural Kenya showed that 89 percent of children with epilepsy were not on anti-epileptic medication. If we are training people strategically we can have a positive impact. That is why we focus on paediatric sub-specialties. Pulmonologists from Kenya, for example, have returned and have updated the national vaccine policy. I think South Africa has a responsibility for the whole continent. We are lucky enough to have the resources and we have to manage illnesses that are often very similar to other parts of Africa – we can all improve by working together and learning from each other.

3 What impact does the DAAD have on the programme?
The number of DAAD-supported trainees per year has just increased from three to four, and the funding is about a third of the whole training costs, so it makes a huge difference for our budget. This year we will train doctors from Zambia, Tanzania, Zimbabwe and Uganda with the help of the DAAD – in neonatology, neurology, general paediatrics and intensive care. One former trainee from Kenya has returned and is now helping to set up a transplant and dialysis programme. They have completed their first successful paediatric transplant already. It is important that the DAAD supports training within Africa. When doctors train overseas, they learn complex techniques that are almost a dream in many centres in Africa.

Since 2007, the African Paediatric Fellowship Programme (APFP), run by the University of Cape Town, has trained paediatricians from all over Africa at the Red Cross War Memorial Children's Hospital in Cape Town – the biggest and most advanced children's hospital in Sub-Saharan Africa. So far, 32 doctors from 11 countries have received training in general paediatrics or sub-specialties and now act as multipliers in their home countries. In 2010, the DAAD started to support the trainees by granting scholarships.

In their own words ...



»I have been involved with the DAAD-NRF scholarship programme now for two years. It holds a lot of opportunities and is more flexible compared to the other ones I have encountered before. I would encourage other students to apply. It is not just a scholarship; you get more benefits from it!«

Nonzaliseko Yumata, PhD student in Chemistry, University of the Witwatersrand, Johannesburg



»Coming from a disadvantaged background, really just struggling and working on a shoestring budget with only my mother at home, the scholarship is really important for me. I am very grateful because it is really giving me the opportunity to do what I always wanted to do.«

Karabelo Nkoe, Master's student in Laboratory Health Sciences, University of Cape Town

»The scholarship holders' meeting is very encouraging and inspiring. You want to go further and do more research because of the people you meet in academia who enjoy the same passion.«

Elmien Truter, PhD student in Social Work, North-West University, Vanderbijlpark



»The title of my Master's is "Mobile Music Making for the Urban Youth", which is essentially finding new ways for people to express musical creativity using mobile phones. I want to see if we can do something for the urban youth in Africa specifically. I'm lucky. I'm one of the few people who are doing what they really love.«

Mohato Lekena, DJ and Master's student in Computer Science, University of Cape Town

»I applied for the DAAD-NRF scholarship programme because Demography is not a well-funded field in this country and I really needed a scholarship that recognized the scarce skill that it is and provided funding as well as networking opportunities.«

Nicole de Wet, PhD student in Sociology/Demographic Science, University of the Witwatersrand, Johannesburg



»The in-country scholarship has really enabled me to focus on my research. I haven't had to work part time, so I spent the dedicated time conducting research and gaining clinical training in the field of Neuropsychology.«

Catherine O'Leary, Master's student in Neuropsychology, University of Cape Town



»I come from a family with a single mother. Me and my sister went to the university at the same time and there has been a lot of pressure on my mother to pay for all that. The DAAD bursary has given me the opportunity to actually live in a safe environment and not have to worry about things like basic food and accommodation.«

Ryan Daniels, Master's student in Zoology, Stellenbosch University



3 questions for Ralf Hermann

Head of the DAAD Information Centre Johannesburg



Ralf Hermann has been in charge of the DAAD office in Johannesburg since 2008; he also teaches literature and cultural studies at the University of the Witwatersrand.

1 How important is the DAAD-NRF Scholarship Programme?

In terms of numbers, this is DAAD's biggest programme in South Africa. Together with NRF, we support 100 Master's and PhD students every year. We want to include traditionally underprivileged students, enabling them to study and pursue an academic career. And we can observe a very pleasing trend: in the last few years, the application figures have increased significantly, as has the quality of the applicants. We are now managing to recruit more black and coloured students for the programme than ever before. In this way, the DAAD is playing a part in achieving national transformation goals.

2 What did the DAAD focus on during the German-South African Year of Science?

The DAAD was definitely one of the most committed and visible players in the Science Year. The Alumni Conference in Cape Town allowed us to strengthen our longstanding bonds with former scholarship holders from the DAAD, the Humboldt Foundation and other partners; we were also able to introduce hopeful, young South African academics to the idea of cooperating with German partners at our meeting for in-country scholarship-holders. The "Research in Germany" seminar showed just how interested the South African research community is in making contacts in Germany. And vice versa: German universities were very interested in the webinar at which we presented the opportunities for collaboration in the South African higher education landscape. Lastly, our German-South African Research Lecture Series "Energy Sciences" allowed us to focus on an area that picks up on themes that are central to collaboration between the two countries as well as being core themes of the German-South African Year of Science, such as climate change, urbanisation and the social scientific dimensions of energy research.

3 What are the challenges facing South African universities?

Equal opportunity, integration, inclusion. A society like South Africa that is in the process of such fundamental change has to deal with conflicting priorities. Better primary and secondary education is just as essential as excellently-qualified researchers who can make or keep South African universities internationally competitive. South Africa needs even more international exchange in order to produce a broader, better-networked generation of academics and researchers. I don't think university education and vocational training should be seen as two strictly separate topics. It is much more important to create intersections to facilitate the acquisition of qualifications with strong theoretical and practice-related elements. Finally, despite the undisputed importance of the natural and engineering sciences, it will be important to appreciate and promote the role of the humanities and social sciences in supporting social change.

DAAD maintains

- an information centre (IC office) in Johannesburg
- three lectorships (University of the Witwatersrand, Johannesburg, University of Stellenbosch, University of the Western Cape)
- a professorship in automotive engineering at Nelson Mandela Metropolitan University in Port Elizabeth (supported by VW South Africa)
- a chair in political science in the Cape region

Mission Home

Studying to combat poverty

Animal scientist Andries Malate had one special reason for going to university: to help the poor farmers in his home region in eastern South Africa.

He still cannot imagine how he managed to get to university. For nearly ten years, Andries Malate spent every spare minute doing the same as all the other farmers' children in the poor eastern part of South Africa: looking after the goats. Most of the adults in his village near Kruger National Park are illiterate; the families live on what they can scrape together from their fields or herds. There are no jobs and, in some areas, no electricity and no running water. "In that sort of situation it's difficult to have long-term goals, because you're constrained by poverty," he says. "Hardly any of the kids at school even knew what a university was."

But Malate was ambitious and did very well at school. On the recommendation of his history teacher, he was awarded a Mayor's Registration Fee Bursary to enrol for animal science at the University of Zululand. "I had to work evenings, weekends and in the holidays to earn enough for the next semester," the 26 year-old recalls. It was a tough time and he nearly gave up on a number of occasions when his money ran out. But he managed to get as far as a Master's in Animal Nutrition at the

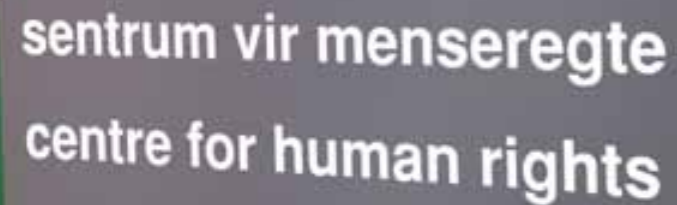
University of Pretoria, which he will complete in 2013 with the support of a DAAD-NRF scholarship. "Without the scholarship I wouldn't have had any chance of continuing my studies," he says. "It gave me completely new perspectives for the future."

The problems of poverty in his home region are also the subject of his research: he wants to provide small farmers with an alternative to commercial goat feed, which is expensive. He suggests mixing a strain of bush clover that grows everywhere with urea to achieve a high level of production at a lower cost, because feeding naturally from grass does not provide enough nutrients in the dry season

Malate can hardly wait to finish his degree and return to his home region to start working for the local agricultural administration or as a technical advisor to small farmers. "I know how serious their problems are and I want to find solutions," he says. So he will only consider a doctorate if he can combine it with practical work on the spot. "I'm convinced it's my task in life to help the people where I come from."

»I come from a poor family. Nobody's working. I'm the breadwinner, and at the same time so much is expected from the future. Without the DAAD scholarship I wouldn't have had any chance of continuing with my studies.«





sentrum vir menseregte
centre for human rights

Human Rights for the Whole of Africa

Training a critical mass of experts and creating awareness

The Centre for Human Rights (CHR) is genuinely unique: in its role as an independent NGO, it raises funding for its programmes and, as part of the Faculty of Law at the University of Pretoria, it awards university degrees. Legal scholars, lawyers, prosecutors, civil servants and human rights activists all work at CHR. They have made the Centre into one of the leading human rights institutions in Africa.

The continent is, to some extent, reflected in its staff: the director is South African, his deputy comes from Cameroon and the person who has been in charge of the Master's programme in Human Rights and Democratisation in Africa for many years, is Ugandan. At CHR, internationality is both lived and taught. "We have consistently broadened our perspectives. Originally, we concentrated on South Africa, but soon other African countries came into focus, too," says CHR director Frans Viljoen, describing development, which very much reflect his own experience. "My African identity has always been very strong, as has my will to bring about change. After my doctorate, I spent a year touring 40 African countries by car and visiting their law faculties – it really opened my eyes," he recalls.

In 1986, legal scholars at what was then the very conservative University of Pretoria started developing strategies for the post-apartheid era, and founded CHR – a difficult undertaking. However, a few years later, once segregation had been abolished, CHR law scholars had a hand in writing the constitution and drafted children's and human rights legislation. They thus created the basis for today's internationally renowned institution for human rights in Africa. "When we introduced the Master's programmes in 2000, we had no idea whether we would be able to implement and finance our plans," says Norman Taku, CHR's deputy director. "We got in contact with funding organisa-

tions all over the world. We raised the initial funding as an NGO and advertised our programme at African universities. Today, we're overrun with applications," Norman Taku comments.

DAAD – in from the very beginning

Every year, 30 students from all corners of Africa embark on the Human Rights and Democratisation in Africa programme, one of four Master's courses at CHR, and 13 of them receive DAAD scholarships. For this course alone, the centre now receives some 450 applications – from lawyers, prosecutors, civil servants, NGO workers and legal scholars. "Over the years, we've developed a sixth sense for selecting the people who are genuinely motivated and passionate about the issues," reports Martin Nsibirwa, who was one of the first generation of students back in 2000. The Ugandan stayed at CHR after completing his Master's and, for the last three years, has been a programme officer. A specialist on women's rights, he explains how important sponsors really are. "Particularly in the field of human rights, there are hardly any government scholarships because the issue isn't exactly popular with African rulers. This is why the DAAD's continued support since 2000 has been one of our most important mainstays."

DAAD scholarship holders also attract a lot of attention, often receiving awards for their thesis work or overall academic performance.

Straight into employment

The twelve-month Master's programme is very work-intensive: after six months on the campus in Pretoria, which involves a combination of lectures, seminars and practical units, all the students relocate to one of the other 12 partner universities in 11 African countries for the following six months. In this time, they write their dissertations and complete an internship in a local organisation. "The placements are very diverse, ranging from the African Commission on Human and Peoples' Rights, or NGOs campaigning for women's rights, to electoral observation commissions," explains Norman Taku.

After this, the graduates immediately start work. According to a CHR evaluation, 95 percent of them work in the area of human rights – in grassroot organisations, in national and international NGOs, in public administration, in the police force, as government officials and ambassadors, and as political advisors. Such success does not go unnoticed. In 2006, CHR won the UNESCO Prize for Human Rights Education. And the University of Pretoria even alters its semester scheduling to accommodate CHR. "Our degree

ceremony always takes place on 10 December, International Human Rights' Day. All the rest of the students are on holiday by then," says Frans Viljoen, explaining the centre's special status.

There is now a vibrant CHR alumni association, with active national branches in more than 15 African countries, and others are currently being set up. "We're known as the human rights mafia, and we're proud of it," says Horace Adjolohoun, Alumni Coordinator, in the 2012 Alumni Newsletter. This is precisely the idea: to create a firm basis for academic and practical training in standards, institutions and mechanisms for the protection and promotion of human rights and democracy. "While there is still a lot to be done to for the realisation of human rights and democratisation in Africa, this programme has helped unleash a powerful force for change, a momentum that needs to be supported for it to be sustainable", says Frans Viljoen.

www.chr.up.ac.za

Franz Viljoen has been the director of the Centre for Human Rights in Pretoria since 2007.



Development is not a Matter of Millions

Entrepreneurship against hardship and poverty

In one of the poorest parts of South Africa, in the Eastern Free State, sociologist Grey Magaiza wants to train school-leavers to become entrepreneurs in order to solve the problems in their villages from the inside.

By now they actually trust him. Grey Magaiza was a stranger when he came to their village – like so many before him. But most of his predecessors disappeared pretty quickly, and the projects they had launched along with them. Like the idea someone had that it would help the people of Makwane if they collectively cultivated vegetables. But the greenhouses have fallen into disrepair and the fields are lying idle because there was no one to buy the harvest. “Most of the projects are never completed,” says Altaia Matshidiso. She sits on the steps of the village hall with her fellow campaigners, her curly hair gleaming in the sunlight.

It is Tuesday afternoon and sociologist Grey Magaiza has arrived to talk to them about how they are getting on with their observations. He has an idea, too: he has motivated the young women to document the problems in their community in order to find ways of solving them themselves. “Grey has given us cameras and when we see something that isn’t right, we take photos and write it down,” says Matshidiso. The photos are the basis for social projects the young women want to implement themselves. Lots of images have already been taken – of the overcrowded health station, of schoolchildren smoking marijuana, of small children playing in the filthy river.

Grey Magaiza motivates young women from Makwane to tackle local problems.



Training social entrepreneurs

“The photos increase their awareness of the needs and problems of their community. This is the only way projects have a real chance of succeeding,” says Grey Magaiza. “We’re going to show the photos to the most important stakeholders – from village elder to entrepreneur – and ask them for financial support for the projects.” The 32 year-old is a sociologist at the University of the Free State’s rural Qwaqwa Campus near the border with Lesotho. For his doctoral thesis he is working with ten school-leavers from two villages in the area – Makwane und Thibella.

“I am investigating strategies to help young people become social entrepreneurs and change their immediate environment so that they can fight their lack of prospects and poverty.” On campus he teaches them the skills they need to become social entrepreneurs, such as project management, accounting and computing. “At the beginning, they were very passive, but now they realise that they really can use this knowledge to make something happen.”

Magaiza came to South Africa from Zimbabwe, having studied Sociology at the University of Zimbabwe in Harare. In 2008, he became a lecturer at Qwaqwa Campus and started researching for his doctorate two years later. He applied for a DAAD-NRF scholarship and was successful. “I feel I have a special responsibility because of it. I would like other people to benefit from my research, too,” explains Grey Magaiza, whose own background in Zimbabwe was very humble. “I know what it means not to have anything. That’s why I want to use my doctoral thesis to develop practical solutions to poverty.”

Projects to generate prospects

All ten participants completed secondary education, but there are no jobs for them in the region and their parents cannot afford to send them to university. Qwaqwa is one of the poorest parts of the country: most people are unemployed and live on welfare. “Since I finished school I’ve spent the whole time sitting at home doing nothing. Now I know why I did my matric,” says Lizy Mokoena. “Later on, we want other young people to join us and take on responsibility,” she says.

Grey Magaiza hopes the social projects will become self-supporting and create jobs for marginalised young people. There are already a number of concrete ideas, such as a food programme for people with HIV. “Many of them don’t have enough to eat. They take their medication on an empty stomach, which causes health problems,” Gladys Medhlala explains. A sewing project is also



»We now have a basis to run a project of our own. He has taught us the skills we need.«



»I knew this project was important for me right from the very beginning. It gives me hope.«

planned in which women will make school uniforms and sell them cheaply. “Because in many families the children don’t go to school because they haven’t got enough money for the uniform,” says Jonas Mosala. The 23 year-old is the only male participant. Most young men are not interested. “They want to make a fast buck for drink and drugs, and they’re lazy. That’s our biggest problem here.”



3 questions for Barry Green

Director of the African Institute for Mathematical Sciences (AIMS)



Prof. Barry Green took his doctorate at the University of Cape Town and his habilitation at Heidelberg University. He has been the director of AIMS in Cape Town/Muizenberg since 2010.



The young women are all agreed: Grey Magaiza has changed their lives.

Traditional gender roles

The girls have a hard time justifying their participation in Magaiza's project, too. Particularly in South Africa's rural areas, traditional gender roles are powerful. "In our culture, the fathers tell the mothers they have to stay at home, that women are weak and men are strong, but we prove the very opposite," says Johanna Mosia. This is why the young men in the village are so suspicious of the project. "They think we're too forward and say that nothing will ever change in Thibella," explains Catherine Mofokeng. "But something will change if we keep going."

Grey Magaiza hopes local politicians, NGOs and traditional authority figures will be persuaded by the engagement demonstrated by the budding social entrepreneurs. "It's wrong to believe that young people are useless and don't want to engage," the sociologist is convinced. "We

just have to let them find a way." When he finishes his doctorate he wants to set up an NGO himself so that he can continue supporting his ten protégés and perhaps even transfer the model to other areas. "Development is not a matter of millions coming from elsewhere," he says. "We have to learn to utilise the assets we have."

»I would like other people to benefit from my research, too.«

1 What is so special about the AIMS Master's programme?
We have an intensive, 24/7 learning environment here: the students live and work in the same building – there are often discussions going on late into the night. At the moment, we are teaching seven South Africans and 53 students from other African countries. We employ a very innovative approach: we're not interested in learning for exams – instead, the students are supposed to ask questions, interact and make mistakes. In this way, we want to create a solid basis and then spark their interest in a particular field of mathematics, which most of them then go on to study at the doctoral level.

2 What are the objectives of the Next Einstein Initiative?
The point of the Next Einstein Initiative is to ensure that Africa itself has the potential to make decisive breakthroughs in mathematical sciences. We urgently need a backbone of mathematical scientists. Maths plays a crucial role in many areas, but experts often have to be brought in from abroad although there is plenty of talent in African countries. The students who come to us are very enthusiastic; they want to get on themselves and make a contribution to Africa's future. In order to find and promote these people, we want to set up 15 AIMS institutes across the entire continent by 2021. Two years ago, an AIMS centre was opened in Senegal, a few months ago, one in Ghana, and the next one is due to open in Cameroon.

3 What role does the DAAD play in the project?
The DAAD has supported AIMS since 2008, and this really is important for our doctoral training. As a centre of excellence we are responsible for selecting the DAAD's scholarship recipients in mathematics from all over Africa. So far, a total of 39 scholarships have been awarded to doctoral candidates from 16 different African countries. Then there is the DAAD's postdoctoral programme, which enables former scholarship holders from Africa to spend time researching here with us. Last year, we had a researcher from Madagascar who has now become a lecturer at Stellenbosch University. At AIMS Senegal, an endowed chair was established by the Alexander von Humboldt Foundation in 2012, and the DAAD also provides doctoral and postdoctoral scholarships there – another important step on the way to a pan-African network of mathematical sciences.

The African Institute for Mathematical Sciences (AIMS) in the Cape Town suburb of Muizenberg offers an intensive, 12-month Master's programme in mathematical sciences for Bachelor's graduates from all over Africa. The curriculum was developed jointly with the universities of Cambridge, Oxford and Paris Sud. In 2008, a research centre for doctoral students and postdocs was also established, focussing on mathematical and physical biosciences, mathematical finance and economics, cosmology and astrophysics as well as computational mathematics. In addition to academic teaching and research, AIMS promotes maths education in South Africa, provides free learning materials for school students and organises in-service training courses lasting several weeks for maths teachers at rural schools.

Pioneer on Campus and in the Community

Sumita Ramgareeb successfully continues to write her family history

Her family came to South Africa's east coast from India a good 150 years ago – cheap labour for the sugarcane plantations. Today, Sumita Ramgareeb manages the Breeding and Field Resource Unit at the internationally renowned South African Sugarcane Research Institute (SASRI).

Gently rolling green hills, palm trees and small, windy roads define the landscape of Mount Edgecome, a few kilometres from Durban and site of the South African Sugarcane Research Institute, SASRI. A light breeze grazes the sugarcane seedlings in the trial fields and, for a few moments, the humidity becomes bearable. This is where Sumita Ramgareeb, born in South Africa's second largest city, Durban, can indulge her passion for science. "I love researching, setting up series of tests and transferring the results to industry. That's my contribution to development in South Africa."

She heads the Breeding and Field Resource Unit at SASRI and is thus responsible for the institute's most important – and most well-funded – research programme. At eight research stations in the east of the country, SASRI is developing new varieties of sugarcane that have a high sucrose content and are resistant to many pests. South Africa's sugar industry plays a significant role in the largest and most powerful economy on the continent, producing some 2.2 million tonnes of sugar every year and providing work for approximately 400,000 people.

Indian, but different

Sumita Ramgareeb came to SASRI in 2004, intrigued by the close cooperation between scientists and farmers who cultivate the sugarcane on their land and, over the generations, have become experts on climate, pests and growth. With her Indian background, the biologist is both continuing and changing the sugarcane tradition at the same time. Her ancestors were amongst the contracted labourers brought to South Africa after 1860 to do the arduous work in the sugarcane fields. They largely settled in what is now called KwaZulu-Natal, where most of the million or so Indians in South Africa still live today. Sumita Ramgareeb has remained true to the region, too. A biologist with a PhD, she has broken with many traditions. "For Indian parents there are three dream jobs: teacher, doctor and lawyer. The idea of a woman scientist was quite foreign to them," she recalls.

Her grandfather, however – precisely because his own parents and grandparents had worked in the sugarcane fields – had done everything he could to encourage his eight children and their offspring to go to university. "In the summer holidays, he got me to copy articles from the encyclopaedia. I particularly enjoyed the ones on plants." But at the end of the 1980s, it was quite impossible for one of five daughters of a dockyard worker to find the money to study. "In 1990, I was awarded a DAAD scholarship for my BSc. During this period of change in our country, support was encouraged for non-white students," says Ramgareeb.

The scholarship: a springboard

When Nelson Mandela was released in 1990, life on campus seemed much the same as it had been under apartheid to the undergraduate Sumita Ramgareeb. "I was one of the few non-white students at the University of Natal. There was no open animosity, but segregation lived on." She was not invited to parties and had to eat on her own. But the young scientist was heartened by the DAAD. "This scholarship was the springboard for my career, and I wanted to give something back and change the university."



So Sumita Ramgareeb stood for election to the student council, the first and only non-white to do so – and was successful. "My fellow students were very suspicious. They'd never had anything to do with an Indian before. For them it was a culture shock," the 40-year-old now remembers. She made sure the student parties took place in parts of town where blacks and Indians could also go – at the beginning of the 1990s there were still a lot of restaurants in Durban that only served white guests.

Unlike her excellent marks at school, Sumita Ramgareeb's performance at university dropped off: the difference was too great and she missed her familiar environment. On graduation, she was all the more amazed when she received her faculty's annual Dean's Award. "Until then, this award had always been granted for outstanding academic achievements. I was given the award for my services on behalf of the interests of undergraduate students." Her own performance improved. Her Master's thesis, slightly expanded, gained her a PhD for her research on the rehabilitation of





Researching for Women

On the contradiction between democratic and customary laws

Nearly all the workers in the fields of South Africa are women, although they seldom own the land. Naadira Nadasen is investigating this discrimination and wants to bring the topic into greater public focus.

“So far, research on land use in South Africa has always just examined conflicts between ethnic groups. The difference between women and men plays no role at all,” Naadira Nadasen explains. “Statistics show that women represent over 50 percent of the world’s population and provide 60 to 80 percent of the world’s agricultural labour, yet research indicates that they own less than five percent of the world’s land. In South Africa we talk about equality and democracy without considering gender equality at all.”

Geographer and environmental scientist Nadasen is investigating the controversial topic of land use from a gender perspective at the University of KwaZulu-Natal in Durban. She wants to know precisely how men and women use land, what rights they have and what they are thinking. In this case, as so often in the young democracy of South Africa, it is all about the conflict between customary laws and new legal regulations. “After apartheid, the most important thing was equality between ethnic groups. Now it’s time to look at equality between men and women,” Naadira Nadasen emphasises. For her doctorate, the DAAD-NRF scholarship holder is studying two communities in the KwaZulu-Natal region, one near Durban, the other in a rural area. “I distributed 400 questionnaires in each community and am just evaluating the responses. The data will provide an insight into the different ways men and women acquire and use land. I will also be able to highlight how land and property disputes are dealt with in these two communities.”

Traditions live on

Currently, the 28 year-old junior researcher is interviewing village leaders, regional politicians and public administrators. “I want to discover more about political practice. And I also want to trace how traditional role models are passed on.” Her research is supposed to drive change. “My results are practically applicable. I could imagine working for the government before becoming a postdoc.”

As a South African of Indian descent, Nadasen knows what traditions and stereotypes mean. “I was shocked when a fellow student from the Indian community asked me why I wasn’t married at 28,” she explains. After the death of her father, the older sister supported the family, as the

mother was a housewife. “Luckily, we were encouraged to study and pursue our own interests, although my aunts and uncles still keep asking me when I’m finally going to get married.”

As a lecturer at the university, the dedicated researcher was also confronted with traditional gender roles – by black, coloured and Indian students. But Naadira Nadasen is a convinced feminist and sets her hopes on role models in other countries. “I’m waiting for the first woman president of South Africa. It’s time women moved up into the front row.”

»My research is my contribution to development in South Africa.«

soils impacted by acidity from gold mining. She collected and identified grasses that thrive under these difficult conditions, create a micro-climate for other plants, and bind the fine dust produced by the mining at the same time. “My results were also important for the people who live near the mines and suffer because of this fine dust.”

Research and management

Changing to SASRI in 2004 was no problem because applied research had been its mission since it was founded. The sugarcane farmers pay a levy to the institute; there is no state funding. In the many greenhouses and trial fields on Mount Edgecombe, Sumita Ramgareeb investigated how to cultivate healthy seeds from plants damaged by pests and became an expert on the propagation of sugarcane from the meristem. And in 2010, she took off her lab coat and joined the management. “I know my grandfather

would be proud of me. The fact that I, an Indian woman, have become a successful scientist and manager in sugarcane research closes the circle of my family history.”



Solving Urgent Problems with Mathematics

Models and computer simulations for the real world

From water supply to contaminant diffusion in the fast-growing cities of the developing world – mathematician Mapundi Banda translates real life challenges into mathematical models. He wants his subject to drive social change.

The things that trigger personal development in life are often totally random and unscheduled. When computer scientist Mapundi Banda decided he was going to do a doctorate in his favourite subject, mathematics, it was clear he would have to leave the University of Malawi and go abroad. “I heard about scholarships from a German organisation and made enquiries at the German Embassy. I was given a flyer which was my first encounter with the DAAD,” he remembers.

Mapundi Banda had taken his Master’s at Imperial College London and was teaching at the University of Mala-

»Africa has something to give if you work together with the people. «

wi. “I wanted to introduce my students to mathematics and show them how relevant the subject is for all sorts of areas of life.” Whilst trying to find a suitable place to study, he discovered the University of Kaiserslautern. Together with 14 other DAAD scholarship holders from developing countries, he embarked on a Master’s in the Department of Technomathematics in 1995 – which was not without its difficulties. “My Bachelor’s from Malawi wasn’t good enough, and my Master’s in computing science wasn’t really relevant. But the DAAD and Kaiserslautern had confidence in me,” says the 45 year-old.

From the very first semester, Banda was determined to take his doctorate in Germany. “My supervisor was very critical at first,” he recalls. But the young student was ambitious. He took extra German lessons to get beyond the beginner’s stage, especially as it was far too tempting to stick together with the other scholarship holders and speak English all the time.

New scientific horizons

For Mapundi Banda, what was and has remained decisive, apart from all the intercultural experience, was the way this period of study changed his outlook on science. “Oral examinations were completely new to me. Before, I’d just had to reproduce the knowledge I’d acquired; now I had to start discussing problems, not just reeling off the theory.” This problem-driven approach used by industrial mathematicians concurred with his desire to apply mathematics and spark the enthusiasm of his students. “Since my time in Germany, I’ve known that you can only do a really good degree if you’re able to discuss the deeper issues,” he says, describing his scientific ‘credo’.

At Kaiserslautern, the DAAD scholarship holder had another aim in mind, too. “I wanted to show my mentors that Africa had something to give them if they worked together with people.” His achievements were so convincing that after completing his Master’s and spending two years at home, he returned to Germany – a DAAD scholarship holder once again, this time at TU Darmstadt.



“I came back to the scientific family of my professors from Kaiserslautern and I became very close to them personally, too. I still visit them once a year.” Mapundi Banda stayed for five years and returned to Africa with valuable baggage in tow: a doctorate, and loads of experience as a post-doc. In addition, he had also experienced the founding of the Fraunhofer Institute for Industrial Mathematics, which was spearheaded by his supervisor, Professor Helmut Neunzert.

Urgently needed: junior researchers

Mapundi Banda has remained true to applied mathematics to this day. Since 2005, he has been working in South Africa, initially at the University of KwaZulu-Natal, then at the University of the Witwatersrand and, since 2012, as a professor at Stellenbosch University. “I search for partners in industry to tackle South Africa’s problems.” One issue is water supply in the burgeoning cities with their 1960’s infrastructure. “We urgently need new water pipes and to secure supplies to all districts, irrespective of location.”

The scientist utilises computer simulations and analyses mathematical models for networked flows and the optimum use of valves. He is also working with a collaborator

in Canada on mathematical models to illustrate the incidence and transport of contaminants in air pollution. Junior researchers are urgently needed to address these current issues. “We need young maths students,” says Banda, “who don’t leave university after their first degree to start earning money. But it’s difficult to get them to do a dissertation. The financial situation in many families is so insecure that every bit of income counts.”

University partnerships are one way of enabling young junior researchers to acquire qualifications. Banda campaigns on this front, engaging his “own” German university, Kaiserslautern, which specifically promotes a worldwide network of applied mathematicians, as a major partner. He sees the future in South African-German collaborations as well as South-South cooperation, funded by the DAAD, with universities in South Africa, Germany, Indonesia and India.



The CO₂ Capturer

A research career despite obstacles

To bind climate-damaging carbon dioxide and protect the environment – this is Marvin Piet's goal. Now a chemist at the University of the Western Cape, the young man from a humble background traversed a rocky road to get there.

Just a few square metres are enough to help solve a global problem. In his lab on campus at the University of the Western Cape, Marvin Piet analyses nanoparticles, or to be more precise, chemically modified mesoporous materials based on silicon, and enhances their ability to bind climate-damaging carbon dioxide. "My research results can be used for all sorts of post combustion-processes, such as at coal-fired power stations or in car exhaust systems," says Piet. The idea of binding CO₂ is not new, industry already uses various products. But Piet hopes to go one step further. "We are searching for solutions that are effective, environmentally-friendly and cheap," he says. "I want to do my bit to ensure that less CO₂ gets into the atmosphere."

Now 29, Piet was an enthusiastic chemist back in his schooldays. He was especially interested in Preparative Chemistry, which deals with the production of chemical compounds. "I love discovering new things and getting my hands dirty," he says. But it was not a straight road to the Chemistry Department and PhD student status. Just like most of the other children in his class, he wanted to start earning money when he left school. His mother persuaded him to indulge his passion and study Chemistry instead. "I went to a state school and the standard was poor, as it often is in South Africa. I wasn't even vaguely prepared for university," Piet recalls. The first few months on campus were a real shock to him. Financial hardship forced him to break off his studies and he only returned when he had enough money to complete his Bachelor's degree.

After that, things started looking up. For his Master's course he was given a student loan for financially disadvantaged students, and he started his doctorate on the strength of a DAAD-NRF in-country scholarship. "The scholarship meant I could work on my doctorate full time and not be a burden on my family," he says. "And it opened doors to the future."

In the summer, he will receive support from the DAAD to travel to Germany and conduct research in the Institute of Chemical Reaction Engineering at the University of Erlangen-Nürnberg. "I shall use my time there to extend my research project and upgrade the quality of my results."

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