



Securing our future

2011

RESEARCH REPORT

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG





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SECURING OUR FUTURE

MESSAGE FROM THE VICE-CHANCELLOR AND PRINCIPAL
PROF. LOYISO NONGXA

I was honoured and privileged to chair the Ministerial Committee on the National System of Innovation in South Africa at the request of the Minister of Science and Technology, Ms Naledi Pandor. It is an area of considerable interest to me since its impact on the future development of any country, particularly a young democracy like ours, depends on it.

One of the key revelations of the study is that the science and technology landscape in South Africa is tremendously fragmented and uneven, be it geographically, intellectually, ideologically, across and between sectors, or through access to quality data, resources and support. This incoherence is compounded by a grave lack of interconnectedness and collaboration between the public and private sectors, research councils, higher education institutions, civil society and other social actors. There are some lessons to be learned here. Other developing countries like South Korea, Malaysia and Singapore, having realised the centrality of innovation as a core driver of their

economic and social development, are advancing a common objective and collaborative effort amongst all sectors towards its achievement. We need to emulate their example.

GLOBAL CHANGE AND SUSTAINABILITY RESEARCH INSTITUTE

Another gratifying experience on which I would like to reflect is one of Wits' flagship programmes – the prestigious Global Change and Sustainability Research Institute (GCSRI) that was launched ahead of COP17 in 2011.

This Institute will tackle issues related to global change, climate change and sustainability in a revolutionary way. It will bring to bear the distinct capabilities of environmentalists, social scientists, researchers, academics, economists, biologists, innovators, strategists and energy experts, as well as representatives from government, industry and civil society to resolve the complex issues we face today, and in the future. Its strength lies in the interdisciplinary nature of its research and on the networks and connections that it has, and will continue developing, within and beyond the University.

The University has seen a similar trend emerging across the faculties, with the added focus on open access research - a 'new' approach to conducting science. A successful multi-country study focusing on ageing in eight different countries on two continents, saw scientists in the School of Public Health publishing online and encouraging the sharing of information and large data sets to ensure much wider access to scientists from around the globe. This is certainly a requirement that more funders are seeking given its wider impact and better value for their investments.

21ST CENTURY RESEARCH INSTITUTES

The University has identified the strongest of its strategic research areas, and has plans to build them aggressively, with focus and ambition. The GCSRI is one of six prominent institutes that Wits has envisaged.

The Sydney Brenner Institute for Molecular Bioscience has also been launched and it will address the steady increase in non-communicable diseases in African populations such as diabetes and heart disease, in addition to the already substantial burden of infectious diseases.

The Wits Mining Research Institute will be launched in 2012. The other three institutes will focus on the Evolutionary

Sciences, Wellbeing and Development, and Cities.

Wits has a special research niche and a notable scientific, geographical, sociological and historical edge in each of these areas. The University is now working steadily towards turning these areas into leading 21st Century Research Institutes.

WITS ENERGY FORUM

One of the greatest challenges of the 21st Century is centred around energy and I am hopeful that the Wits Energy Forum will serve as a multidisciplinary hub to develop proposals and recommendations on how we should respond to the energy imperative.

Energy straddles multiple disciplines but it ultimately impacts on the quality of life of all people.

South Africa is one of the highest emitters of carbon dioxide in the world, and as a University located in the economic heartland of the continent, we have the responsibility to bring the best minds to bear, to find lasting solutions to the complex energy problems facing our country and the continent. We need to integrate energy awareness and literacy into our curricula and promote energy efficiency in society, with the aim of changing behaviour in the long-term. We must indeed reflect on ourselves as an institution to determine how we can be a responsible energy-conserving social citizen.

There are numerous disciplines and areas of opportunity related to energy at Wits – from energy and environmental law to the social sciences; from offering professional short courses to developing clean coal technology (one of our current strengths), and from energy engineering to renewable energy alternatives.

THINKING AHEAD

There are numerous examples of integrated research in the global change arena at Wits, some of which are reflected on these pages. However, we need to bring together our traditional strengths, the best minds, worldclass infrastructure and inspiration, to foster new ways of thinking. We need imaginative and creative approaches to build our capacity to be a worldclass, innovative society that competes in the global knowledge economy. This should be our rallying call as a nation, as we build a better, more sustainable future for ourselves and generations to come. It is in our hands. ■



Photo: Maritz Verwey

WITS IS ON AN UPWARD TRAJECTORY

MESSAGE FROM THE DEPUTY VICE-CHANCELLOR (RESEARCH)
PROF. HELEN LABURN

I hope that you will enjoy reading our Research Report for 2011, which coincides with my first year in the hot seat. After spending the bulk of my career in the University's Medical School, each month in the job has opened my eyes to whole fields of research that I previously knew very little about. The depth and breadth of research at Wits is a source of wonder and inspiration to me.

This being so, no single publication of this sort can hope to cover all research. One of the landmark events in our country in 2011 was the COP17 Climate Change Conference held in Durban, in which Wits scientists were involved. This has inspired us to adopt a broadly green theme for the 2011 Report, with elements of sustainability and global change running through many of the articles. As in the 2010 Report, this latest version draws attention to some specific success stories. The rest of the Report is intended to be indicative of the sort of research done at Wits in 2011, to demonstrate to the reader the breadth and depth of our research and to inspire a search for further information.

In 2011, the University was home to 15 NRF A-rated scientists, six MRC Units or Groups, two DST/NRF Centres of Excellence (one jointly with Stellenbosch University) and one DTI Centre of Excellence. It also hosted 16 South African Research Chairs. In response to the 2011 call, the University submitted a number of new Chair applications and three were successful. These will be reported in the 2012 Research Report.

The year brought news of success in seven National Equipment Programme (NEP) and two National Nanotechnology Equipment Programme (NNEP) applications

to the NRF, bringing in some R32.7 million in grant income. Our 2011 publications claim to the Department of Higher Education and Training was the highest ever, although the official count will only come through towards the end of 2012. Taking all these indices together, research at Wits is clearly on an upward trajectory.

The prestigious Smithsonian Institute identified four projects of our Institute for Human Evolution as being amongst the top 10 hominid discoveries in the world in 2011, with the celebrated Sediba find at number one.

We have ambitious plans to create six major new research institutes, as follows:

- Evolutionary Studies Institute
- Sydney Brenner Institute for Molecular Bioscience
- Wits Mining Research Institute
- Wits City Institute
- Global Change and Sustainability Research Institute, and the
- Wits Institute for Wellbeing and Development.

These '21st Century Institutes' will become our research flagships in the years to come and a significant contributor to our aspirations to climb up the international rankings. They are at varying stages of development. In 2011 the

Sydney Brenner Institute for Molecular Bioscience held its inaugural Advisory Board meeting and the Global Change and Sustainability Research Institute was formally launched. I look forward to discussing further progress in my next report.

In 2011 the long-awaited re-housing of Wits' illustrious collection of African art took place, when the collections were moved into the new Wits Art Museum (WAM). This was the culmination of the better part of a decade of fundraising by the curator and her staff and the WAM will become a focal point for art lovers in Gauteng and beyond. We will be able to put a far larger proportion of our collection of artworks on display than ever before, conduct more research and train more students. This is the most exciting development in the arts in Johannesburg for many years.

The University was the beneficiary of a number of major grants from overseas funders, including the Mellon Foundation, the Howard Hughes Medical Institute, the British MRC, the Wellcome Trust, the University of Bergen and the European Union. Domestically, the University was the recipient of major funding under the NRF's NEP and NNEP equipment programme, the NRF's Global Change Programme and the Technology Innovation Agency. These grants, excluding the NEP and NNEP, vary in value between R1 and R2.6 million a year.

Thirteen projects ran in 2011 under the NRF's THRIP Programme, bringing in R8.9 million from the NRF and R15.5 million from industrial partners.

Internally, the University Research Committee (URC) was given a budget of R78 million, of which R18.5 million was for equipment. A substantial portion of this was used to co-fund the equipment acquired under the NEP and NNEP.

Wits has continued to feature in the top 300 universities worldwide, as defined by the Shanghai and Times Higher annual ranking surveys, one of only two South African universities to do so. It is the University's avowed aim to continue to climb the ladder. These rankings are based on several criteria, of which research is an important one.

Another measure of research excellence is that we have 227 NRF-rated researchers, a significant increase on any prior year and the number continues to grow. Professors Glenda Gray and Lewis Ashwal were awarded new A ratings by the NRF and Professors Jill Adler, Arthur Every, Duncan Mitchell and Beric Skews were re-affirmed as A-rated scientists. Dr Trevor Vickey was awarded a P rating - the exceptionally prestigious category for young scientists.

Professors Fazel Mahomed and Arnold Knopfmacher became Fellows of the Royal Society of South Africa. Prof. Maureen Coetzee and Associate Professors Aimee Stewart and Lizette Koekemoer received DST Women in Science Awards.

Professors Andrea Fuller and Yahya Choonara were inducted into the inaugural membership of the South African Young Academy of Science, as was joint Wits/NICD staff member Dr Penny Moore.

Further evidence of a bright future for research at Wits was the fact that Prof. Shane Norris was awarded one of the inaugural African Research Leadership Awards of the British

MRC, marking him out as one of the leading young medical researchers on the continent. Dr Baves Kana was awarded the highly competitive International Early Career Scientist Award by the Howard Hughes Medical Institute. Both awards come with substantial funding over a five year period, which ought to cement the growing reputations of Norris and Kana and establish them amongst the country's most distinguished medical scientists.

The African Network for Drugs and Diagnostics Innovation (ANDI) announced two new Centres of Excellence based at Wits in October 2011, namely the Centre of Excellence in Advanced Drug Delivery Technology, led by Prof. Viness Pillay and the Centre of Excellence for Viral Gene Therapy, led by Prof. Patrick Arbuthnot.

As always, we had a number of distinguished visitors. In January Sir David King, former scientific advisor to the British Government, opened the 2011 SA Chemical Institute Convention. In February, Prof. Ben Fine from the School of Oriental and African Studies, University of London, attended the launch of a new DTI capacity building programme. In March, Prof. Harald zur Hausen, 2008 Nobel Prize winner and a German virologist, visited the University as a guest of the Division of Anatomical Pathology. In May, Dr Hein Geingob, former Prime Minister of Namibia, opened the first African Economic Law Conference. In July, Dr Tingye Li, a pioneer in the increase in the speed of optical communications received an honorary DSc degree from Wits. Dr Heide Hackmann, Secretary-General of the International Social Science Council, delivered the keynote address at the launch of the Institute for Global Change and Sustainability in November. That same month, Margaret Thorogood, Professor of Epidemiology at the University of Warwick, visited the School of Public Health to deliver a lecture on health problems affecting elderly rural dwellers. Also in November, Prof. Robert Tijssen of the University of Leiden came, as part of what is intended to be an ongoing collaboration, to advise us on criteria for research excellence, which would best advance our cause in climbing the global rankings. In December, Prof. Mark Hanson, British Heart Foundation Professor of Cardiovascular Science, amongst other positions, formally launched the new Wits/MRC Unit on Developmental Pathways for Health Research.

This Report includes mention of two specialist units within the University, in the form of Wits Enterprise and the Wits Health Consortium. Both are wholly-owned University companies. Wits Enterprise provides specialist assistance to researchers in contract negotiations and pricing, patent registration, technology transfer and project management. The Wits Health Consortium runs a range of clinical trials, many of them multi-centre international trials, and funds independent medical research.

As in any year, there were low points. Included in this category would be the passing away of some notable researchers. Details are listed in the obituary section.

I hope that you enjoy reading this Report and that you will find much to interest and inspire you. ■



TOWARDS RESEARCH AND KNOWLEDGE LEADERSHIP

MESSAGE FROM THE DIRECTOR OF RESEARCH AND DEVELOPMENT
DR ROB DRENNAN

Socio-economic drivers, like the Millennium Development Goals, focus the need to develop solutions for pressing problems that face the globe and, particularly, the continent. It is believed that the answers will arise from new knowledge created by research intensive universities, including those in Africa.

In South Africa, the National System of Innovation expects applied research and development to contribute to the growth of the economy and therefore enable the country to meet its unique development requirements.

For these reasons the output from research intensive universities in South Africa, including the University of the Witwatersrand, Johannesburg (Wits), must increase. To this end, Wits' current three-year strategic plan (*Wits Strategy 2013*), which falls under the 2022 Strategic Framework, has Research and Knowledge Leadership as one of its seven objectives.

However, Wits faces three acute problems in meeting this strategic priority. They are (i) many of the most prominent and able researchers are nearing retirement (ii) insufficient numbers of the next cohort of researchers have PhD degrees and (iii) the existing research community is insufficiently representative of South Africa.

Therefore, the Wits Research Office established a Directorate for Research Development in March 2011. The purpose of this Directorate is to nurture, enhance and stimulate research across Wits' five faculties and so address the problems. To achieve this, the Directorate has, in collaboration with existing Wits competencies, focused on five priorities, namely:

- Skills enhancement – developing non-technical skills;
- Knowledge transfer – through one-on-one mentoring and coaching engagements between experienced and emerging researchers;
- Recognition – recognising achievements in the realm of research;
- Exploiting networks – linking researchers with appropriate funders; and
- Removing barriers – assisting to remove or reduce (internal) hindrances to research.

Progress towards achieving these priorities is briefly discussed below.

SKILLS ENHANCEMENT

The objective is to ensure that Wits' researchers are comprehensively skilled for the task at hand.

The intervention that supports this objective is to provide a concerted and structured skills development programme, focused on the peripheral skills necessary to be an effective researcher. Peripheral skills refer to non-technical skills related to the 'art and craft' of research. The technical skills, on the other hand, are those skills that relate to the disciplinary focus of the research.

KNOWLEDGE TRANSFER

The objective is to maximise the transfer of knowledge from the existing research talent to the cohort of emerging researchers.

The Mellon Retiree Mentorship Programme which is focused on the Humanities, currently has 32 mentees and six mentors. It is hoped that this programme can be extended to other faculties in the future.

RECOGNITION

The objective is to develop an environment that is conducive to research across all five faculties. It is acknowledged that this environment may differ from faculty to faculty.

The single major event in terms of recognition was the celebration of NRF rated researchers at Wits that took place in October 2011. The function was addressed by Dr Andrew Kaniki of the Knowledge Field Development Directorate of the NRF and was attended by the VC, DVC of Research and some 100 rated researchers. In future this event will be added to the almanac of the University.

EXPLOITING NETWORKS

The objective is to increase the success rate of funding applications.

Funding proposals are attempts to convince a grant-funder, who is held responsible for the funds that they manage, to invest in a particular research proposal. The decision is mostly based on research merit (as adjudicated through peer review) and strategic fit with the stated objectives of the grant-funder. Assuming that research merit is never questionable at Wits, alignment between the proposed research and the strategic intent of the funder is the key deciding issue for success.

REDUCING UNNECESSARY BARRIERS

The objective is to reduce unnecessary barriers, be they internal or external to Wits that hinder research.

It is difficult to quantify success in this area without the input of independent sources and so for the purposes of this Report the interventions are simply listed.

- Financial reporting
- Understanding and implementing cost recovery systems
- Procurement of capital equipment, and
- Interactions with Property and Infrastructure management.

In conclusion, the response from the University community to the newly formed Directorate has shown that the need for support with research development is very real. I sincerely hope that the service provided to date has lived up to the expectations of the Wits research community. ■

RESEARCH OVERVIEW

THE UNIVERSITY RESEARCH COMMITTEE

Membership of the University Research Committee

The membership of the University Research Committee (URC) in 2011 is shown below. Members are appointed jointly by Senate and Council and serve a term of office of three years, which may be renewed.

Ex Officio:

Chairperson:	Prof. HP Laburn
Vice-Chancellor:	Prof. LG Nongxa
Deputy Vice-Chancellors:	Professors Y Ballim and R Moore
University Librarian:	Mr F Ubogu
Council Appointed:	Professors B Lacquet, G Eagle, P Manger, C Penn and Dr S Ndlovu
Faculty Appointed:	Professors R Gibson, A Kramvis, R Muponde and N Rankin
Deans' nominee:	Prof. AM Crouch
Appointed by the Postgraduate Association:	Mr J Lun
Chairs of the Faculty Research Committees:	Professors LA Cornish, B Kramer, M Leon, HM Marques and M Pieterse
By invitation:	Dr G von Gruenewaldt

Some of the major issues addressed in 2011

- Review of the research performances of all five Faculties during 2010
- The quantum of the Council budget for research, which was generally perceived to be inadequate
- The quantum of recognition to be given to books and creative outputs
- The proposal to create six new major Research Institutes
- The call for South African Research Chairs

Research Thrusts

The research thrusts approved by Senate and Council to date and still active in 2011, are set out below.

1. Biodiversity – Champion: Prof. ETF Witkowski
2. Evolution of the Species and Natural Heritage – Champion: Prof. BS Rubidge
3. Cities – Champion: Prof. AS Mabin
4. Materials Science and Engineering – Champion: Prof. LA Cornish
5. Mineral Resources, Exploration and Mining – Champion: Prof. R Gibson
6. South Africa/India – Champion: Prof. CI Hofmeyr
7. Diseases of the Lifestyle: an emerging African problem – Champion: Prof. NJ Crowther
8. Molecular Biosciences – Champions: Professors M Ramsay and MEC Rey
9. Global Change and Sustainability – Champion: Prof. AM Crouch

DETAILS OF URC-RECOGNISED RESEARCH ENTITIES

Institutes	Director
1 BPI Palaeontology	Prof. BS Rubidge
2 Economic Geology	Prof. AH Wilson
3 Global Change and Sustainability	Prof. AM Crouch (Acting)
4 Human Evolution	Prof. F Thackeray
5 Materials Physics	Prof. E Sideras-Haddad
6 Molecular Sciences	Prof. HM Marques
7 Rock Art	Prof. BW Smith
8 Social and Economic Research (WISER)	Prof. B Bozzoli (Acting)
9 Society, Work and Development	Prof. K von Holdt
10 Sydney Brenner Molecular Bioscience	Prof. M Ramsay (Acting)
11 Wits Reproductive Health and HIV	Prof. VH Rees
Research Units	Director
1 Antiviral Gene Therapy	Prof. PB Arbuthnot
2 Applicable Analysis and Number Theory	Prof. A Knopfmacher
3 Bone Research Laboratory (1)	Prof. U Ripamonti
4 Carbohydrate and Lipid Metabolism	Prof. FJ Raal
5 Cardiovascular Pathophysiology and Genomics	Prof. G Norton
6 Clinical HIV	Prof. I Sanne
7 Developmental Pathways for Health	Prof. SA Norris
8 Effective Care	Prof. GJ Hofmeyr
9 Flow	Prof. BW Skews
10 Health Communication	Prof. C Penn
11 Malaria Entomology	Prof. M Coetzee
12 Human Genomic Diversity and Disease (1)	Prof. H Soodyall
13 Perinatal HIV	Prof. G Gray
14 Protein Structure-Function	Prof. HW Dirr
15 Pulmonary Infections	Prof. C Feldman
16 Respiratory and Meningeal Pathogens (1)	Professors K Klugman and S Madhi
17 Rural Health in Transition (1)	Prof. SM Tollman
18 Soweto Cardiovascular	Prof. K Sliwa-Hanhle
19 Theoretical Physics	Prof. JAP Rodrigues
Notes: 1. These entities carry joint Wits/MRC recognition	
Research Groups	Leader
1 African Ecology and Conservation Biology	Prof. RN Owen-Smith
2 Brain Function	Prof. A Fuller
3 Climatology	Prof. SJ Piketh
4 Health Policy (1)	Dr J Goudge
5 Water in the Environment	Prof. KH Rogers

CENTRES OF EXCELLENCE

The University hosted two National Research Foundation (NRF)/Department of Science and Technology (DST) Centres of Excellence. They are:

- Strong Materials (Director: Prof. Lesley Cornish)
- Biomedical Tuberculosis Research, jointly with the Universities of Stellenbosch and Cape Town (Director: Dr Bavesh Kana)

Further, Wits staff members participated in the Centre of Excellence in Catalysis, based at the University of Cape Town.

A third Centre of Excellence, in Aerospace, operates at Wits under the auspices of the Department of Trade and Industry (Director: Mr Rudolph Louw).

AWARDS

INTERNAL AWARDS

VICE-CHANCELLOR'S RESEARCH AWARD

The Vice-Chancellor's Research Award was made to Prof. Maureen Coetzee. She holds the South African Research Chair in Medical Entomology and is the Director of the Malaria Entomology Research Unit. She is a leading authority on the malaria parasite. Such is her standing in the discipline that when she discovered a harmless new subgenus of the *Aedes* mosquito, her peers named it after her – the *Coetzeemyia*. One of the principal thrusts of her research is to control the spread of the parasite, which is a major threat to public health across large swathes of the African continent and elsewhere. The purpose of the award is to stimulate research and research related scholarly activities by acknowledging and rewarding a quite exceptional worker who has been engaged in research and more general scholarly activity at the University. The award is open to all full-time academic staff between the ages of 38 and 65.

FRIEDEL SELLSCHOP AWARD

The current awardees are:

Barnes	B	Dr	HCD – Psychology
Ndlovu	S	Dr	Chem Eng and Met
Moore	P	Dr	Pathology – NICD
Kana	B	Dr	Pathology – CoETB
Weinberg	M	Prof.	Pathology – Molec Med and Haem
Thurman	C	Dr	Lang and Lit – English
Vickey	T	Dr	Physics
Gillespie	K	Dr	Social Sciences – Social Anthropology
Choonara	Y	Prof.	Therapeutic Sciences – Pharmacy
Zelenyuk	Y	Dr	Mathematics
Watermeyer	J	Dr	HCD – Speech Pathology
Ally	S	Dr	Social Sciences – Sociology
Harden	L	Dr	Physiology
Jorritsma	M	Dr	Arts – Music
Lemmerer	A	Dr	Chemistry

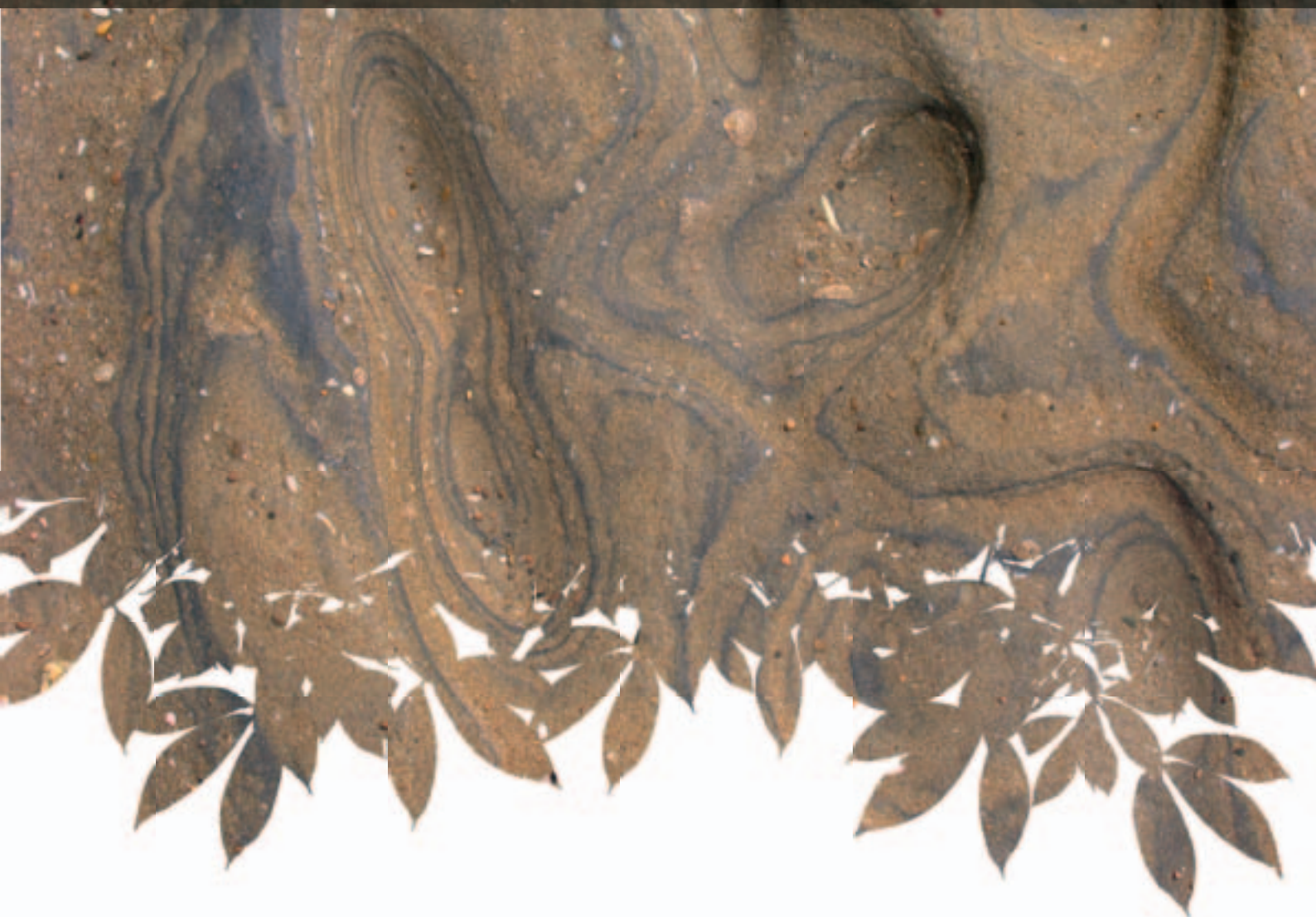
This award recognises exceptional researchers who are under 35 years of age at the date of application. The award takes the form of a substantial grant and may be annually renewed for up to three years in total. The award is open to applicants in all five Faculties.

THE AW MELLON POSTGRADUATE MENTORING AWARD

The University received a fifth award of R8.4 million to cover the period 2009-2012 from the AW Mellon Foundation. The scheme is open to all black, female and disabled Masters and Doctoral students.

**Table 1 Mellon Postgraduate Mentoring Scheme
October 1995 – December 2011**

	Masters	Doctoral	Total
No. taken into scheme	60	166	226
Graduated	49	114	163
Still registered	2	27	29
Discontinued studies	9	25	34
Totals	60	166	226



POSTDOCTORAL FELLOWS

In 2011 the University had 65 postdoctoral fellows. The majority of these were funded by the NRF (28) through its various programmes. The University supported another 21 fellows. Other funders included AW Mellon (6), CH Leon (6) and the Hillel Friedland Trust (2). The remainder (2) were supported by other external funders.

The University continues to recruit the majority (83%) of its postdoctoral fellows from outside its borders. The majority came from Europe (21) where France was the single largest

supplier (5), 20 fellows came from Asia where India was the largest single supplier (12) and Africa provided 19 fellows from six different countries excluding South Africa. The remaining five fellows came from the USA.

The recruitment of high quality postdoctoral fellows remains a priority for the University. To this end several strategies will be followed to increase external funding and better success with competitive funding. The Wits Experience for postdoctoral fellows will be enhanced by improving the information sharing with inbound fellows and implementing the use of a code of conduct for hosts.

SOUTH AFRICAN RESEARCH CHAIRS

In 2011, the University held the following DST/NRF South African Research Chairs:

1	Prof.	S Madhi	Vaccine preventable diseases
2	Prof.	V Pillay	Pharmaceutical biomaterials and polymer-engineered drug delivery technologies
3	Prof.	M Coetzee	Medical entomology and vector control
4	Prof.	CS Henshilwood	Origins of modern human behaviour
5	Prof.	R de Mello Koch	Fundamental physics and string theory
6	Prof.	HM Marques	Bio-inorganic chemistry
7	Prof.	HW Dirr	Protein biochemistry and structural biology
8	Prof.	JB Adler	Mathematics education
9	Prof.	H Venkatakrishnan	Mathematical numeracy
10	Prof.	P Harrison	Development planning
11		Vacant	Faculty of Engineering and the Built Environment
12	Prof.	D Hildebrandt	Sustainable process engineering
13	Prof.	PL Bonner	Local histories and present realities
14	Prof.	V Jejjala	Theoretical particle cosmology
15	Prof.	S Colafrancesco	Square kilometre array
16	Prof.	R Durrheim	Seismology

NATIONAL RESEARCH FOUNDATION RATINGS

The NRF is a government agency which channels funding to tertiary educational institutions for research in the fields of Science, Engineering and Technology, the Humanities and the Social Sciences. As part of the assessment process, the Foundation organises a peer evaluation process of individual researchers.

At the end of 2011, the University had 229 NRF-rated researchers. The figure is made up as follows:

Table 2: Number of NRF ratings

CATEGORY	DESCRIPTION	2011
A	Researchers who are accepted by the international community as being amongst the leaders in their field	15
B	Researchers who enjoy considerable international recognition as independent researchers of high quality	68
C	Proven researchers who have maintained a constant high level of research productivity and whose work is regularly made known internationally	113
L	Members of the academic community who have demonstrated potential as researchers in the past and who can demonstrate that they were prevented from realising that potential, but who now can show promise of being able to establish themselves as researchers within a five-year period after evaluation	2
P	Researchers younger than 35 years who have shown exceptional potential as researchers, or are accepted by the international community as being amongst the leaders in their field, or enjoy international recognition as researchers of high quality	1
Y	Researchers younger than 35 who increasingly exhibit research productivity as individuals or as team members and whose work is regularly made known internationally, or researchers normally younger than 35 years who on the basis of their recent outputs show promise to become recognised specialists within a period of about four years	30

THE UNIVERSITY'S A-RATED RESEARCHERS ARE:

- Prof. Jill Adler (Education)
- Prof. Belinda Bozzoli (Social Sciences)
- Prof. Darrell Comins (Physics)
- Prof. Arthur Every (Physics)
- Prof. Charles Feldman (Clinical Medicine)
- Prof. David Glasser (Chemical Engineering and Metallurgy)
- Prof. Isabel Hofmeyr (Literature and Language Studies)
- Prof. Keith Klugman (Pathology)
- Prof. David Lewis-Williams (Geography, Archaeology and Environmental Studies)
- Prof. Shabir Madhi (Pathology)
- Prof. Duncan Mitchell (Physiology)
- Prof. Norman Owen-Smith (Animal, Plant and Environmental Sciences)
- Prof. John Pettifor (Clinical Medicine)
- Prof. Beric Skews (Mechanical, Industrial and Aeronautical Engineering)
- Prof. Lyn Wadley (Institute for Human Evolution)

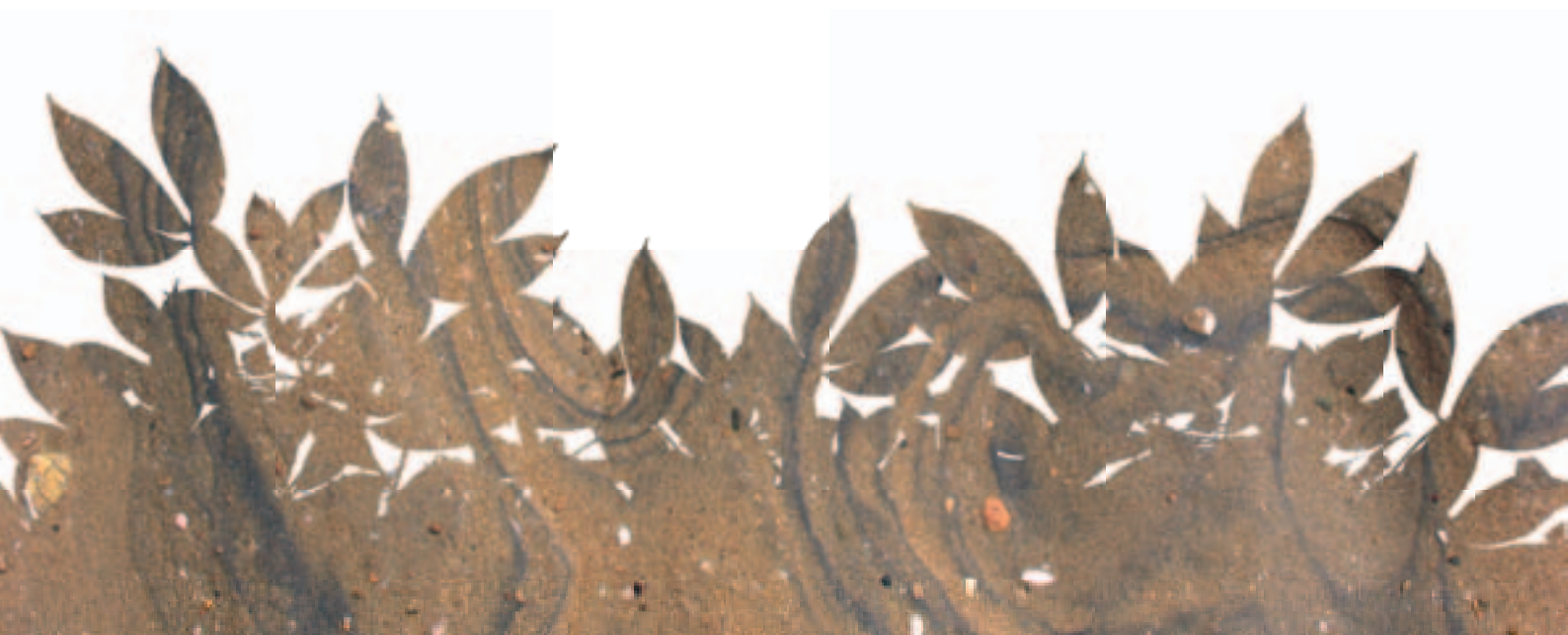
FUNDING SOURCES

Table 3: University Council Funding			
	2011 R'000	2010 R'000	2009 R'000
Direct allocation to Faculties (70%)	32 475	31 787	729
Thuthuka	1 308	1 000	2 500
Sellschop Award	1 002	520	105
NRF Ratings Award	315	30	525
Conference Travel	0	150	135
Publication Awards	60	60	60
Vice-Chancellor's Research Award	250	250	140
Postdoctoral Fellowships	3 691	3 500	3 500
Co-funding of Y, L and P rates	520	430	640
Centres of Excellence	1 067	1 000	986
Minor equipment	3 000	2 000	
Artworks	200	200	200
Research niche areas	305	550	600
Electronic subscriptions	341	420	200
Research report	140	140	125
Animal purchases	350	350	275
Contingencies	3 407	3 814	559
Audit fees	0	50	200
Miscellaneous	20	410	600
Major equipment	18 500	12 500	14 500
Totals	66 951	59 161	56 579

Table 4: Estimate of Available Funding Sources			
General Funds	2011 R' 000	2010 R'000	2009 R'000
URC Grants (1)	42,264	44,661	42,079
URC Equipment grants	18,500	15,625	14,500
Statutory Councils and Govt Depts	109,660	102,591	98,085
Other External Sources (contracts, donations, grants, etc)	86,014	75,751	68,999
Research funds held in the Wits Foundation (2)	179,108	178,863	189,188
Totals (3)	435,546	417,491	412,851
Notes 1. The 2011 figure excludes a rollover of R10.005 million in unspent prior year funds; the cost of the Research Office and the five central services (Central Animal Unit, Microscopy and Microanalysis Unit, Art Museum, Radiation and Health Physics Unit and Central Optical Unit) are excluded throughout 2. This figure reflects the year-opening balances of funds known to be held in the Wits Foundation for research funding purposes; taking year-end balances will result in significant double-counting. It must be remembered that not all the funds reflected in the above table were available for spending in the year shown – some funds may be investment capital or funds committed to later years. 3. This figure excludes funds held in the Wits Health Consortium			

Table 5: Funds from Statutory Councils

Science Councils	2011 R' 000	2010 R'000	2009 R'000
National Research Foundation	90,473	69,824	71,640
SA Medical Research Council	6,701	8,936	8,650
Other Govt Depts and Science Councils	12,486	23,831	17,795
Totals	109,660	102,591	98,085



OTHER EXTERNAL FUNDING

Table 6: Funds received by Research Field

Research fields	2011 R' 000	2010 R' 000	2009 R' 000
Built Environment	231	1 757	490
Commerce and Management	0	9 487	10 268
Earth Sciences	3 884	5 181	7 119
Palaeo Studies and Archaeology	1 578	1 311	1 147
Education	235	1 359	1 613
Engineering	13 115	16 255	11 412
Humanities and Social Sciences	10 221	3 187	6 996
Law	150	361	527
Biological Sciences	1 397	10 263	6 424
Health Sciences (1)	46 895	20 466	14 120
Materials Sciences	0	1 457	4 612
Physical Sciences and Mathematics	7 368	3 167	3 271
General	940	1 500	1 000
Totals	86 014	75 751	68 999

Notes:

1. This figure excludes funds held in the Wits Health Consortium

Table 7: Funds by Research Field in Wits Foundation, as at 1 January 2011

Research fields	2011 R' 000	2010 R' 000	2009 R' 000
Built Environment	0	10	48
Commerce and Management	1 506	1 743	907
Earth Sciences	4 851	7 725	5 029
Education	168	7 204	604
Engineering	10 728	11 355	17 408
Humanities and Social Sciences	24 298	22 340	24 250
Law	3 785	9 131	190
Biological Sciences	6 722	9 058	6 767
Health Sciences (1)	54 966	60 259	66 299
Mathematical Sciences	1 623	937	1 577
Physical Sciences	5 867	7 777	7 413
Materials Sciences (2)	2 221		
Palaeo Studies and Archaeology	28 286	23 278	31 720
General (2)	34 087	18 046	26 976
Totals	179 108	178 863	189 188

Notes

1. This figure excludes funds held in the Wits Health Consortium (see Appendix)
2. Previously subsumed in Physical Sciences
3. Included here are, inter alia, the NRF Grant Deposit (15,197), the Gauteng City Regional Observatory (6,667) and the Microscopy and Microanalysis Unit (461)

APPLICATION OF FUNDS

Table 8: Expenditure of research funds

	2011 R'000	2010 R'000	2009 R'000
Wages and salaries	101 116	118 351	112 389
Running costs, consumables and equipment	306 769	267 616	270 742
Total	407 885	385 967	383 131
Wage and salary expenditure as a % of total	24,79	30,66	29,33
Total available funds, including balances in the Wits Foundation	435 446	426 691	394 657
Total expenditure as a % of total available	93,67	90,46	97,08

Table 9: Research outputs in 2011

Faculty	Publication Units in 2010 (1)	Doctorates completed in 2011 (2)	Masters by Dissertation completed in 2011	Masters by Coursework completed in 2011 (3)	Total research units	No. of F/T academic staff as at 31/12/11 (4)	Average output per Faculty in 2011	Average output per Faculty in 2010
CLM	94,47	42,00	9,00	115,37	260,84	201	1,30	0,91
EBE	110,23	105,00	47,00	70,57	332,8	137	2,43	1,82
Health Sc (4)	196,55	111,00	90,00	29,95	427,5	149	2,87	2,38
Humanities	256,15	111,00	31,00	128,47	526,62	350	1,50	1,28
Science	264,64	123,00	83,00	19,00	489,64	227	2,16	2,17
Other	14,1							
University	936,14	492,00	260,00	363,36	2 037,40	1 064,00	1,91	1,62

Notes

The main significance of this table is that the DoE funding formula is based on an assumed output of 1.41 "research units" (publications plus higher degrees) per full-time member of the academic staff.

1. 2010 is the latest available year for confirmed DE publication data
2. Each Doctorate scores 3 points in the DoHET assessment
3. Only the component of the final mark contributed by the Research Report is counted
4. Excluding joint staff





Dr Robert Caveney (left) and Dr Gerhard von Gruenewaldt

EMINENCES GRISES

Drs Robert Caveney and Gerhard von Gruenewaldt have played a largely unsung, but very important role in research policy and practice issues at the University for several years. Both are beyond the standard age of retirement, but continue to put in a full shift as advisors to the Deputy Vice-Chancellor (Research), the University Research Committee (URC) and the Research Office.

Dr Caveney retired from De Beers Industrial Diamond Division in 2002, having served as the Director of Research of the De Beers Diamond Research Laboratory and as the Group Quality Manager of the Industrial Diamond Division. Earlier in his career with De Beers he served as the Patents Manager. A Wits doctoral graduate from the Department of Physics, he had played various voluntary roles at the University while still employed by De Beers. He served for nearly a decade on the URC in the 1990s and for three years on the committee that produced a new University policy on privately undertaken work by members of the academic staff. Remaining intellectually active and in pursuit of new challenges, he was appointed in a consultancy role by Wits Enterprise upon stepping down from De Beers. He was able to use his experience of intellectual property management to great effect and became the *de facto* advisor to the University on most matters relating to patents - a role he continues to play. With Dr von Gruenewaldt, they effectively became the fathers of the University's current research equipment policy in 2008, when they persuaded the University to upscale its levels of investment by a quantum leap, partly as a result of a survey carried out by Dr Caveney, which demonstrated that much of

the research equipment then in use was ageing. In addition to his patent work, he has and continues to serve as a committee member on the URC's Equipment Committee.

Dr von Gruenewaldt retired as the Vice-President of the NRF in 2005. The Deputy Vice-Chancellor (Research) of the day Prof. Belinda Bozzoli needed little persuasion to appoint a man known to be an exceptionally well-networked individual on the South African research scene. In addition to his work on the research equipment programme referred to above, he has played several very important roles in the area of research policy, amongst others as a member of the team responsible for writing the Wits 2022 Vision and by emphasising Wits' key role in addressing Africa's challenges through research, by way of symposia and publicity brochures on two occasions, first in 2006 and subsequently again in 2009. In late 2011 he assumed the lead role in updating the 2007-11 Strategic Research Plan of the University. There was no one better qualified to take forward this important initiative given his knowledge of government policies and priorities, which are acquired only by years of immersion in discussion with officials of government departments, particularly the Department of Science and Technology.

He continues, amongst other tasks, to chair the URC's Equipment Committee, advises applicants seeking an NRF rating and assists Prof. Bozzoli with the conceptualisation of the 21st Century Institutes.

Both men are widely respected in the University's research community and they will indeed be a hard act to follow when they really do retire. ■