



**Tshwane University
of Technology**
We empower people

Research and Innovation

FUSION

NRF support improvement of academic qualifications

The Minister of Science and Technology, Mrs Naledi Pandor, approved funding to increase research productivity and the production of high levels skills needed to advance the objectives of the National Research and Development Strategy. Additional funds have been allocated to the National Research Foundation (NRF) to assist with the improving of the academic qualifications of researchers to increase the research supervisory capacity of universities and science councils.

A major barrier for advancing research and post-graduate training at South African universities is the low proportion of academic staff with the appropriate qualifications to oversee post-graduate research and to advance knowledge creation. Overall, only one third of full-time permanent academic staff (PAS) holds doctoral degrees (CHE, 2009). Furthermore, there has been a net decline in the number of full-time university academic staff with doctoral degrees at universities and universities of technology over the same period. The impact of the low proportion of suitably qualified academic staff is an increase in the "burden of supervision" for supervisors (CHE, 2009). This burden of supervision, at both the Masters' and Doctoral level increased across all fields of science between 2000 and 2005. At the Masters' level, the ratio increased from 3,8 to 5,2 students per supervisor; and at the Doctoral level from 1,3 to 2,2 students per supervisor, over the six-year period.

This project is a special intervention aimed at addressing the decline in the number of full-time university academic staff with doctoral degrees and the inadequate supervisory capacity that currently characterise the South African academic landscape. As a direct response, this project seeks to accelerate the training of doctoral candidates with the view to improve the qualifications of employed academics and to enhance their research and supervisory capacity. In recognition of the inhibiting role that limited funds play in the creation of a vibrant academic milieu, this project is a once-off funding intervention to address this problem.

The NRF recently awarded 8 staff members of TUT a grant to improve their qualifications. The successful applicants are, Yvonne Senne and Therese du Plooy from the Faculty of Management Sciences, Caroline Selepe from Quality Promotion, Nalini Naidoo from The Faculty of the Arts, Lizzy Monyatsi and Philani Nongogo from the Faculty of Science, Caroline Khoathane and Rishaad Abdoola from Faculty of Engineering & the Built Environment.



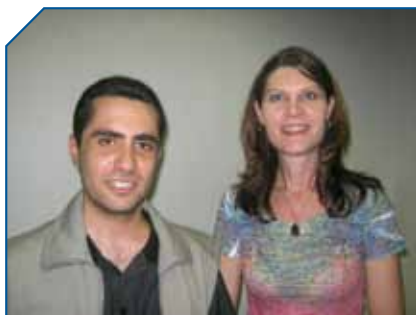
Ms Nalini Naidoo, Dr Mandla Msibi, and Ms Theresé du Plooy



Ms Lizzy Monyatsi, Dr Mandla Msibi and Ms Yvonne Senne



Ms Caroline Khoathane, Dr Mandla Msibi and Mr Philani Nongogo



Mr Rishaad Abdoola and Ms Dilla Wright



Dr Mandla Msibi, Ms Caroline Selepe and Ms Dilla Wright



EMERGING RESEARCHER'S PROGRAMME (ERP)

Call for research proposals for funding in 2011

BACKGROUND

The Emerging Researcher's Programme (ERP) is an initiative of the Central Research and Innovation Committee meant to specifically promote the research development of early-career academics permanently employed at TUT, and to promote the attainment of an NRF Rating. The programme is driven by the University's strategic plan, which is to enhance the development of capacity, knowledge, the economy and society through focused engagement, research and innovation (R&I). This programme is aimed at assisting permanent staff members to develop as researchers and increase their measurable research output in order to eventually obtain NRF Rating. An R&I Professor with a good Research Track Record will be appointed to support these candidates in achieving their goals. A maximum of R100 000 per annum for the running costs will be allocated for the proposed research projects.

CRITERIA

Nominees:

- Must be TUT permanent employees (priority will be given to South Africans - Blacks, Females and people with disabilities);
- Doctoral degree should not be older than 3 years;

- Should be younger than 40 years;
- Should have identified a research focus in an area in which they plan to establish a research track record;
- Should demonstrate that they were unable to establish themselves as researchers due to limited research opportunities; and
- Should not hold any TUT grants simultaneously in the years of funding.

PROCEDURE

To facilitate the process in a timely fashion, the following procedure should be followed:

1. The R&I Professor should nominate up to 3 staff members and discuss the application with them. An application form in Annexure A should be completed and submitted to the relevant FRIC.
2. FRICs should review the nominations and if recommended, submit to the Directorate of Research & Innovation.
3. Directorate of Research and Innovation will then verify eligibility and make an allocation from the CRIC Emerging Researcher's Programme (depending on the availability of funds).
4. The funds must be used within the year of allocation and will be awarded for 3 years, based on satisfactory progress. Any unused funds will be returned to the budget that contributed to this.
5. Nominees who receive the funds should report to the R&I Professor at the end of the funding period, who will then submit a report to the Directorate of Research & Innovation.

CONDITIONS

- It is expected that the funds will assist the nominee to increase their Research Outputs, and achieve an NRF Rating after the 3 years of Financial Assistance (that is, the nominee will apply for his NRF rating during his last year of funding).
- The R&I Professor will monitor the nominee and report on progress.

FUNDING

- A maximum of R100 000 per year over a 3-year period will be allocated from CRIC, based on merit and availability of funds.
- Funds should be used in direct support of the individual's research and can include items such as research related materials/supplies, research tools, e.g. books and databases.
- All expenditure must be in accordance with the University policies and procedures. Capital assets purchased with funds will remain the property of the University. Any unspent balances, capital assets, or items of value remain with the University upon the departure of the staff member.

Priority will be given to REJECTED NRF THUTHUKA APPLICATIONS - Post PhD Tracks.

Please contact Ingrid Botha, Grants Administrator, Directorate of Research and Innovation: ext 5872, or fax 4409, or email bothai@tut.ac.za

Research and Innovation

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Contact us

Directorate of Research
and Innovation
Building 20-132
Tel. (012) 382-5872
Fax (012) 382-4409
www.tut.ac.za

NRF opens an opportunity for universities to apply for Research Chairs

The Minister of Science and Technology, Mrs Naledi Pandor, has approved funding for the awarding of 62 additional Research Chairs to expand the South African Research Chairs Initiative (SARChI). The Research Chairs Initiative was established in 2006 as a strategic intervention of the South African government to reverse brain drain in the public academic and research sector. In particular, the programme is aimed at increasing scientific research capacity through the development of human capacity and stimulating the generation of new knowledge. It is designed to significantly expand the scientific research base of South Africa in a way that supports implementation of the national Research and Development policies. Since 2006, the programme has awarded 92 Research Chairs.

Investment in research, and in particular the Research Chairs, is intended to improve South Africa's international research and innovation competitiveness while responding to social and economic challenges of the country. As such, Research Chairs are to be awarded in all knowledge domains including science, engineering and technology, and the social sciences and humanities.

The NRF is calling for proposals from the 23 public universities to host one or more of the 62 new Research Chairs. Universities may hold such Research Chairs exclusively or in partnership with a public research institution such as another university, a science council, a national research facility or an academic health complex. Research Chairs are not pre-allocated to institutions; however, particular opportunity

will be afforded to universities of technology, rural-based institutions and those that have historically not participated in this programme but now meet the requirements of the Initiative. The awarding of Research Chairs to universities and the approval of nominated candidates will occur in two phases.

Phase 1 of the process requires the submission of proposals by universities to host Research Chairs. Whilst it is preferable for the university to have an identified candidate for the Research Chair at this stage, it is however, not a requirement for the university to submit a Phase 1 proposal to host a Research Chair. Universities must submit a separate application for each of the Research Chairs they propose to host. In addition, each university must submit (i) its Research Strategy; (ii) Programme and Qualification Mix (PQM) approved by the Department of Higher Education and Training; (iii) details of current academic and research staff in the disciplines in which the university proposes to host Chairs; and (iv) statistics on research outputs and postgraduate students trained and graduated for the period 2006 to 2010, in the disciplines in which the university proposes to host Chairs. The award of Research Chairs will be made to universities, following the evaluation of proposals submitted in Phase 1. Research Chairs will be awarded to universities in December 2011 and all Chairs must be filled within one year of the Chair being awarded to the university, which is by December 2012.

Phase 2 of the process will require the university to submit a full proposal, for each awarded Research Chair, which includes a research and activity plan and the nomination of a candidate for appointment to the approved Chair position. The NRF will set two closing dates, at the end of March 2012 and the end of June 2012 respectively, for submission of Phase 2 proposals to give the universities sufficient opportunity to identify suitable candidates.

The Deputy Vice Chancellor, Dr Prins Nevhutalu, has since held a special meeting with all Deans on 6 June 2011, to urge that at least each faculty identify an area in which they can submit a proposal to the NRF.

Research Output

TUT has shown a steady growth in research output publications over the past 3 years, with more than 120-units generated for 2008 and 2009. The Directorate of Research & Innovation has dedicated a great deal of time and effort to the streamlining of processes. An internal panel was elected to review books, chapters in books and conference proceedings. The combined expertise resulted in TUT submitting quality outputs in accordance with the Department of Higher Education and Training [DHET] criteria. For 2010, a record 192.87 units were submitted. The top honours going to the Faculty of Engineering & the Built Environment with 62.28 units submitted, followed by the Faculty of Science with 57.60 units submitted. This is a major milestone for the researchers and a celebration of their dedication and hard work.

Keep up the good work!

R&I Fusion

The Directorate Research and Innovation is proud to distribute the first edition of R&I Fusion for 2011. This edition showcases the successes and achievements of TUT staff and students' research activities across all campuses. These projects are indeed inspiring and motivational; not only for others to do the same, but also highlighting the difference successful research outputs can make within an institution, community and our country at large.



Workshop discusses ethics in research

The Southern African Research and Innovation Management Association (SARIMA) in partnership with TUT presented a very successful skills training workshop on the Fundamentals of Research Ethics at the FNB Auditorium, Pretoria Campus, on 4 and 5 August 2011. Dr Braam Hoffmann (Chairperson: TUT Research Ethics Committee) reported that the event attracted nearly a 100 members and administrators of research ethics committees from different universities in Southern Africa. The presenters included well-known and respected South African research ethics specialists like Dr Lizette Schoeman (Centre for Ethics in Health Sciences, University of Pretoria), Prof Anne Pope (Interim Director, Office of Research Integrity, University of Cape Town), Dr Salome Human-Vogel (Department of Educational Psychology, University of Pretoria) and Dr Lyn Horn (Member of the National Health Research Ethics Council and Research Ethics Consultant, Division for Research Development, Stellenbosch University).

"The workshop kicked-off with two interesting and thought-provoking presentations dealing with the role of research ethics in higher education and the main moral theories that guide research ethics. The rest of the interactive workshop was presented in two parallel tracks dealing with the respective roles of research ethics committee members and ethics committee administrators", said Dr Hoffmann.



Above: Prof Anne Pope (UCT) and Dr Lyn Horn (Stellenbosch University)

Dr Salome Human-Vogel highlighted the ethics principles in qualitative research. "A researcher should not only persuade a person to become a participant, but, they should develop a relationship to build trust and also to show social responsibility," she said. She mentioned that in a situation where a researcher is using modern technology, such as photography, video filming and audio recordings to collect data; they must inform the participants about their intentions. "In a school environment, the parents of the learners should be informed and decide whether they want their children to take part or not."

Prof Allan Munro, Research Professor at the Faculty of the Arts and Deputy Chairperson of the TUT Ethics Committee, explained the criteria that is used by the Committee before giving a researcher the go-ahead to commence with any research.

Below: Prof Allan Munro, Dr Karin Dyason and Dr Braam Hoffman





Students in the run for Mandela Scholarships 3rd year in a row

The Directorate of Research and Innovation has submitted five applications of TUT students for the Mandela Rhodes Scholarships, which, if bursaries are granted, will enable those students to continue with their postgraduate studies. The prestigious Mandela Rhodes Scholarships were established in 2002, as a partnership between the Rhodes Trust and the Nelson Mandela Foundation. The primary intention of the scholarship is to further the ideals of leadership, reconciliation, nation building, education and entrepreneurship that both the great leaders, Nelson Mandela and Cecil Rhodes espoused.

The scholarship is open to all South African and African citizens under the age of 30, who intend to pursue further studies at B Tech, Honours and Masters' degree levels at all the universities registered with the DoE in the country. What the selection panel is looking for is therefore a good balance between academic excellence and entrepreneurship on the one hand, and proven leadership and commitment to reconciliation, on the other hand.

Applicants should have a minimum of 70% in their major subjects and must provide proof of leadership and community involvement. The scholarship covers all tuition and registration fees, accommodation, a basic allowance for equipment, books and other study-related expenses, and a travelling allowance for travel between home and place of study. For masters' students, an additional amount covering research cost or conference attendance is available. In addition, a mentoring and development programme is linked to the scholarship.

The Directorate was impressed by the quality of applications that were received, and this is the 2nd year of which TUT has two students that were awarded a Mandela Rhodes Scholars in a row, and is looking forward to the outcome for 2012.

The following Masters' candidates have been submitted for final consideration (from left):

- Faradja B P - Electrical Engineering
- Kam I B O - Electrical Engineering
- Manganyi U N - Mechatronics Engineering (B-Tech student)*
- Ebewo P E - Entrepreneurship (Management Sciences)
- Mabuza M M - Chemical Engineering

TUT wishes them the best of luck.

TUT-CSIR Scholarship Programme

Since 2008, the relationship between the Council for Scientific and Industrial Research (CSIR) and Tshwane University of Technology (TUT) has been formalised through a Memorandum of Understanding (MoU) on joint research collaboration. In 2010, TUT and CSIR established a partnership to provide Masters' Scholarships in the following areas:

- Natural Resources & Environment
- Information and Communications Technology
- Biosciences and Health
- Built Environment
- Engineering
- Natural and Physical Sciences
- Mathematics
- Material Science and Manufacturing with the focus on smart structures and materials

Currently the Scholarship is only offered to:

- South African citizens only
- The scholarship is meant for full time (unemployed) postgraduate students

- The applicants who obtained an aggregate of at least 65% (at least 60% from designated groups (i.e. Africans, Indians, Coloureds) for the BTech/Honours degrees
- Applicants who are registering for the 1st or 2nd year of their Masters' studies

Scholarship holders are encouraged and expected to spend a limited amount of time working at CSIR facilities during the course of their studies. They are normally supervised by TUT staff and co-supervised by CSIR staff. The amount for the scholarship is R60 000 per annum.

The first scholarships were offered at the beginning of 2011. Five TUT students who received funding through the scholarship programme,

- | | |
|-------------------------------|--------------------------------------|
| • Amelia Tebogo Molele | : M Tech (Metallurgical Engineering) |
| • Linda Lethabane | : M Tech (Metallurgical Engineering) |
| • Mabuatsela Virginia Maphoru | : M Tech (Chemistry) |
| • Ndouvhada Gumani | : M Tech (Chemistry) |
| • Mapula Razwini | : M Tech (Biomedical Sciences) |

Below: Linda Lethabane, Hamilton Mphidi, Mapula Razwini and Virginia Maphoru



NRF invest millions towards equipment to TUT researchers

The National Research Foundation (NRF) awarded millions to TUT in support of research within the National Nanotechnology Equipment and National Equipment Programmes, which will in turn increase research opportunities at the University.

Dr Peter Olubambi from the Department of Chemical and Metallurgical Engineering applied for funding through the Research Support Programme (RISP) and was awarded an amount of R6 876 000 00. In confirming the award, Mrs Anthipi Pouris, Director: Capacity and Strategic Platforms Grants at the NRF said "we have received a large number of high quality applications. All applications went through a thorough assessment process, involving both a postal and an external peer-review panel, whose members are experts in their fields. We wish Dr Olubambi all of the best with his research work".

The funding will be used to purchase much needed equipment to expand on research opportunities - an Ultra High Resolution Field Emission Scanning Electron Microscope and a Tribocorrosion Tester. According to Dr Olubambi, both the Tribocorrosion Tester and the specific model of the Scanning Electron Microscope will be the first of their kind in Africa. The Ultra High Resolution Field Emission Scanning Electron Microscope is a state-of-the-art FE-SEM that successfully combines various analytical functions and ultra-high-resolution imaging. It has exceptional features for ultra high performance SEM, suitable for all kinds of geological and materials analysis especially nano-science.

The Tribocorrosion Tester is an instrument that allows simultaneous measurement of the tribological and electrochemical characteristics of a wide range of engineering materials. It is capable of performing all forms of tribological tests, including wet abrasion, dry abrasion, erosion tests, as well as high temperature wear and mechanical property testing. Applied and technological research is a strategic focus area of TUT and these two instruments will be in use most of the time for multidisciplinary nanotechnology and related research areas. The instruments are therefore expected to contribute extensively to research outputs that will make a difference in our country, continent and the world.

Prof Alvaro Viljoen, Research Professor at the Department of Pharmaceutical Sciences, also received R930 000 from RISP. Prof Viljoen will use these funds for an Ultra Performance Liquid Chromatography System (UPLC). The UPLC is a liquid chromatography system designed to fully utilise technologies. It is routinely used to separate complex mixtures and for a rapid quantification of metabolites in a solution.

Since the introduction of UPLC in 2004, a large number of systems have emanated to aid scientists across the globe to achieve better chromatographic results. By fully utilising the technology that is now commercially available, hundreds of other companies have moved over to this technology. In doing so, they have dramatically increased their throughputs as well as their R&D outputs.

Prof Dharini Sivakumar, Research Professor at the Department of Crop Sciences, also received R 935 000 as part of the programme. Prof Sivakumar will invest in a Gas Chromatograph (GCMS) machine. The GCMS is used for chemical analysis and is composed of two major parts, a gas chromatograph and a mass spectrometer.

Among others, the GCMS will be used in the training of postgraduate students in post-harvest physiology programmes. It is essential for South Africa to develop adequate capacity in post-harvest technology to address critical food security challenges effectively. To achieve this, well-equipped laboratories are required to support capacity development initiatives and research programmes of excellence.



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Staff Training

A very successful *Writing for research publication* workshop was hosted on 18 - 20 April 2011. The workshop allowed 14 researchers from various disciplines an opportunity to hone their scientific writing skills under the guidance of Dr Graham Baker and Dr Elisabeth Lickindorf from Kerlick Editorial & Research Solutions cc. The workshop was funded by the National Research Foundation [NRF] as part of an initiative to raise the research profile of universities. At the conclusion of the workshop, each researcher submitted an Action Plan, with personal signed commitments to dates for completing their article(s). More than half of the participants have already submitted their articles to journals and are awaiting feedback, whilst two articles have been accepted for publication. Congratulations!

In 2011, Dr Nevhuthalu requested that R&I conduct a *Research skills audit & Training needs assessment* at the faculties. The aims of the assessment are: [1] To identify ways to meet the needs, [2] To determine if internal resources [human, financial, etc.] are available, [3] Where no internal expertise exist, to identify external expertise who have delivered in the past and who are likely to deliver in the future, and [4] To have an institutional approach to R&I training. Phase 1 was concluded during May 2011 where the faculties were requested to indicate the training needs of staff members. Phase 2 will commence in September 2011 and will determine which internal resources are available. The survey will focus on human resources, i.e. staff members with expertise who are willing and available to assist with training in the categories specified. The goal is to have a group of presenters for each category to call on for assistance.

InfoEd Research Information Management System (RIMS – National System)

The Universities of South Africa issued a Request for Information (RFI) early 2006 for a system that can promote the development in Research and Postgraduate studies. InfoEd has been accepted as the system with which to move forward. The Research and IT Directors of the core group of institutes (of which TUT forms part) has been the driving force behind the success. This group has also been given a mandate to speak on behalf of other Higher Education Institutes (HEI) and drive the project towards nation-wide rollout. Similarly, the Research Councils have also indicated their desire to be included in the Project. The project is funded by the DST and managed by the NRF. One of the objectives of the system is to have a central repository of research and researcher data, allowing funding and government agencies to view reports as required. The Research Output Module [ROP] was the first to be implemented at TUT in 2010. Training has been provided to the Faculty Research Officers on the ROP for capturing of 2009 and 2010 publication data. The Compliance Systems - Human Subjects Ethics Module, and the Proposal Development (internal funding) and Proposal Tracking (internal funding) Modules will be rolled out during the course of 2011.

RIMS Project Manager
Lucky Senokwane, ICT Services,
Tel (012) 382-0559, senokwaneol@tut.ac.za

RIMS Functional Coordinator
Dilla Wright, Directorate of Research & Innovation,
Tel (012) 382-5154, wrightd@tut.ac.za

Coming up

In the next issue:

- 2010 Academic Excellence Awards
- Newly NRF Rated Researchers at TUT
- Innovation workshop
- Postdoctoral Fellows at TUT