

NELSON MANDELA
UNIVERSITY

“Innovation Through Observation”

Johan Westraadt

Centre for HRTEM, Physics Department, Science Faculty

EPPEI Eskom Power Plant Engineering Institute



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World-class infrastructure and expertise

Engagement activities

1. Professional service based provision

- Microscopy Society of Southern Africa

2. Research

- Power plant steels
- Diamond composites
- Titanium alloys

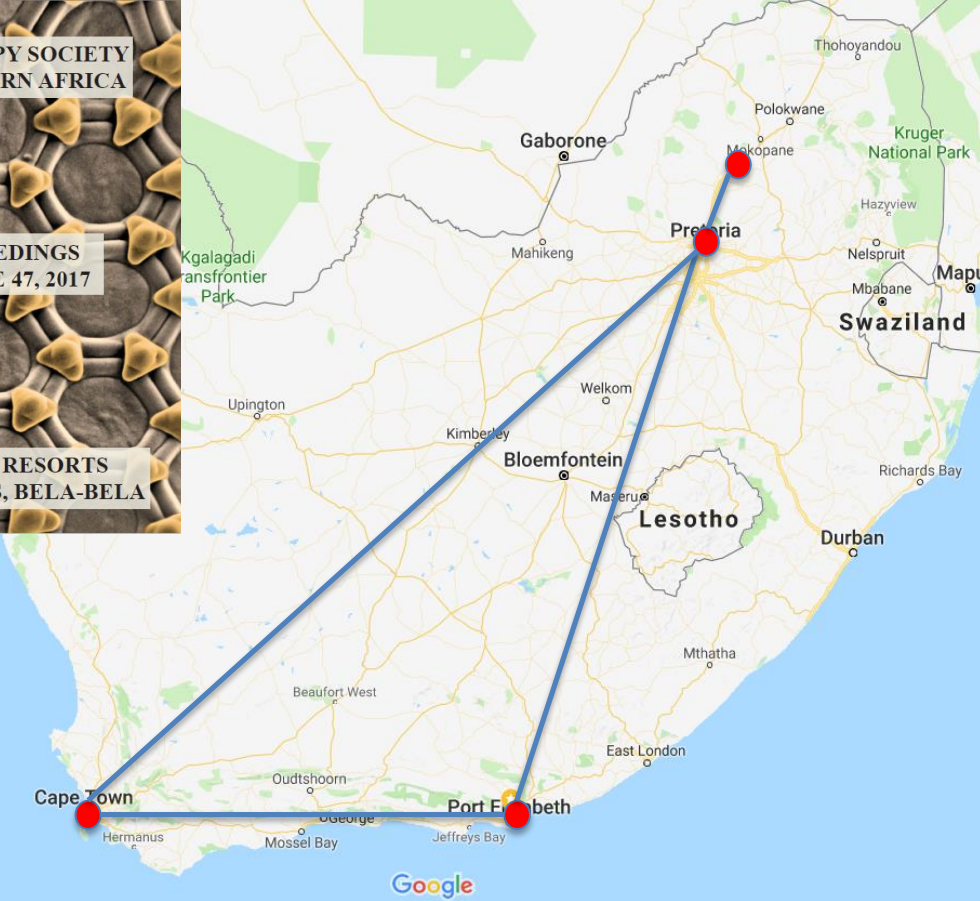
3. Teaching and learning

- Training members of industry and academia

MICROSCOPY SOCIETY
OF SOUTHERN AFRICA

PROCEEDINGS
VOLUME 47, 2017

FOREVER RESORTS
WARMBATHS, BELA-BELA



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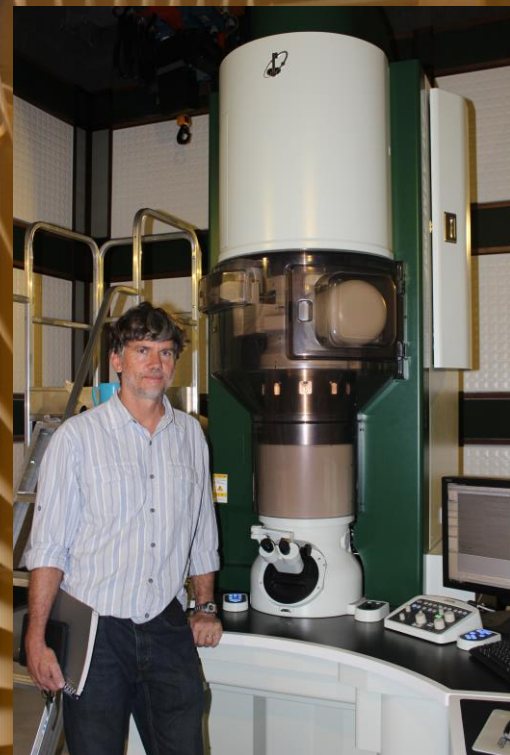
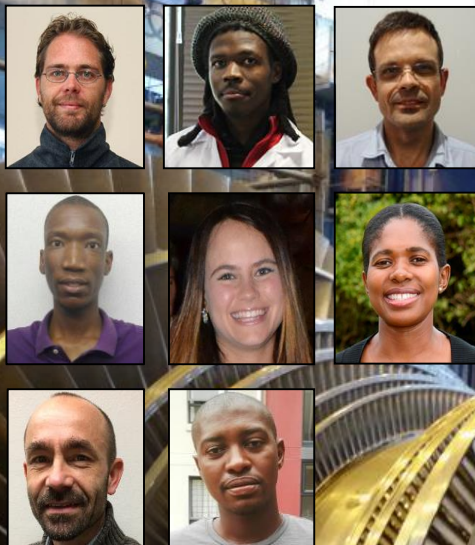
Prof Harry Bhadeshia



Microscopy Society of Southern Africa



EPPEI Eskom Power Plant Engineering Institute

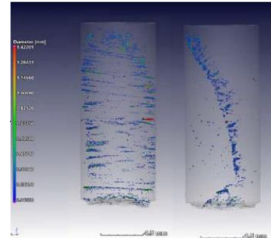


Power plant materials

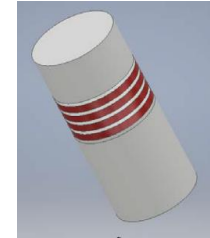
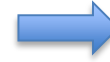
Small sampling/testing performed by



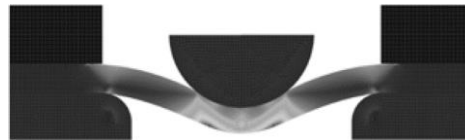
Sampling of service exposed component



X-ray Tomography



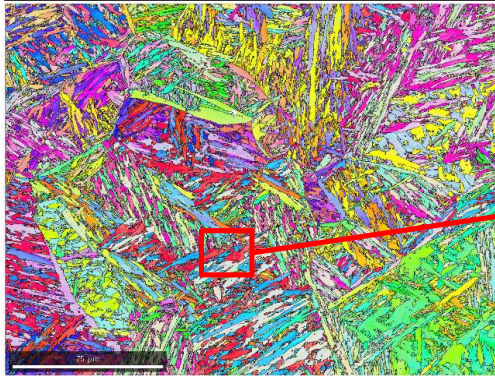
Wet chemical analysis
Hardness testing



Testing

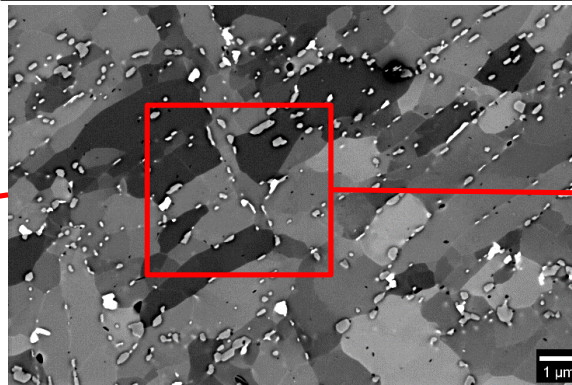
9-12Cr Steel Microstructure (Experimental)

Orientation map

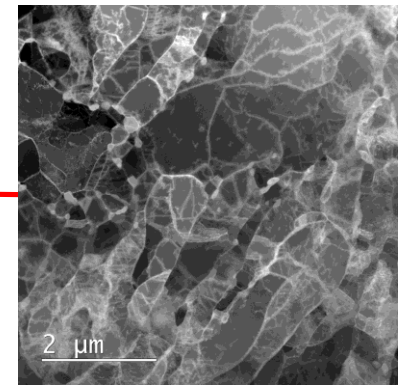


0.075 mm

Scanning Electron Image



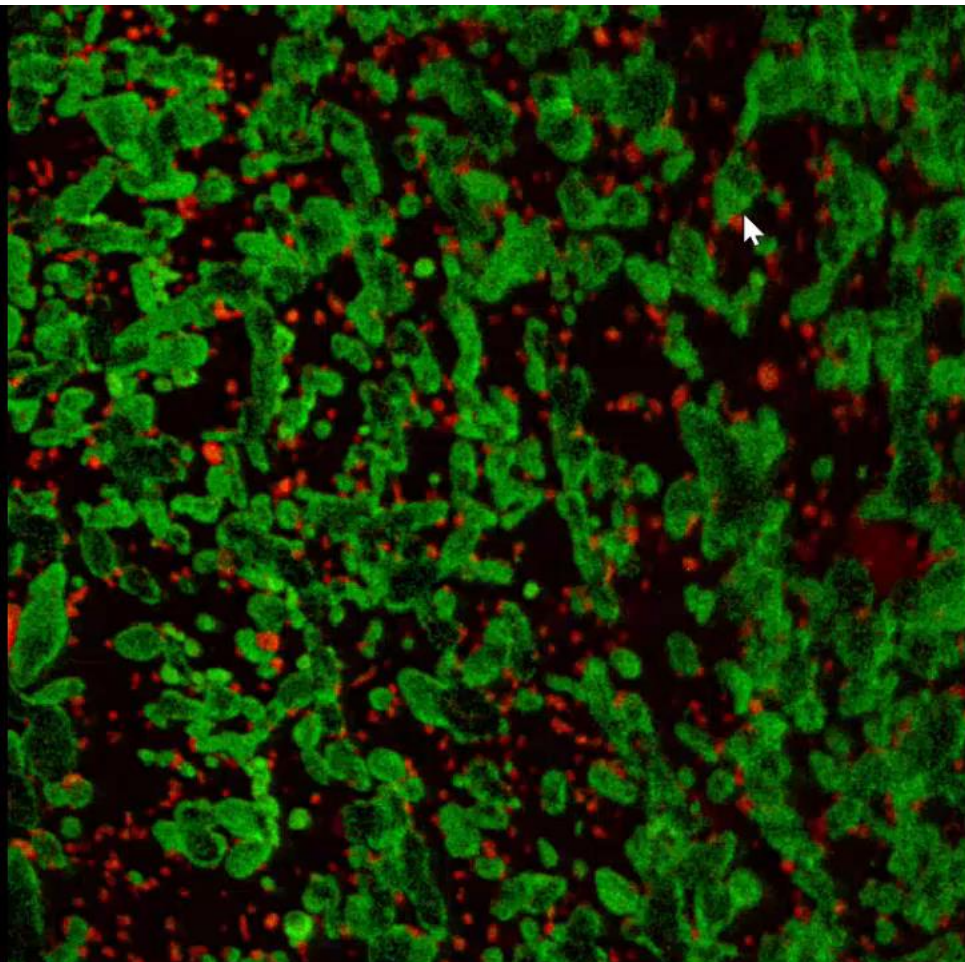
TEM* Image



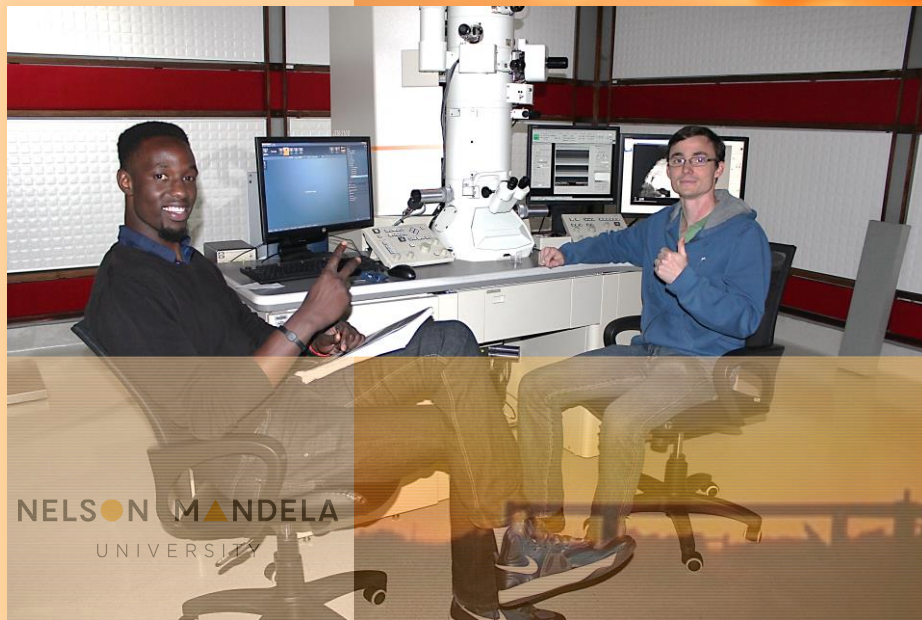
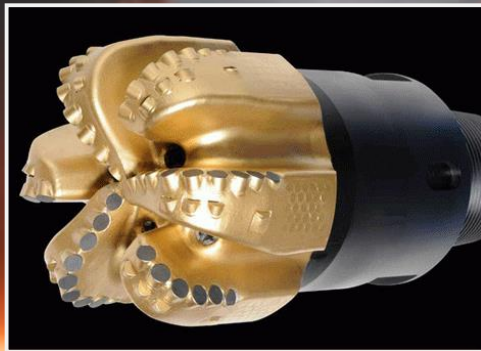
1 mm

Cr

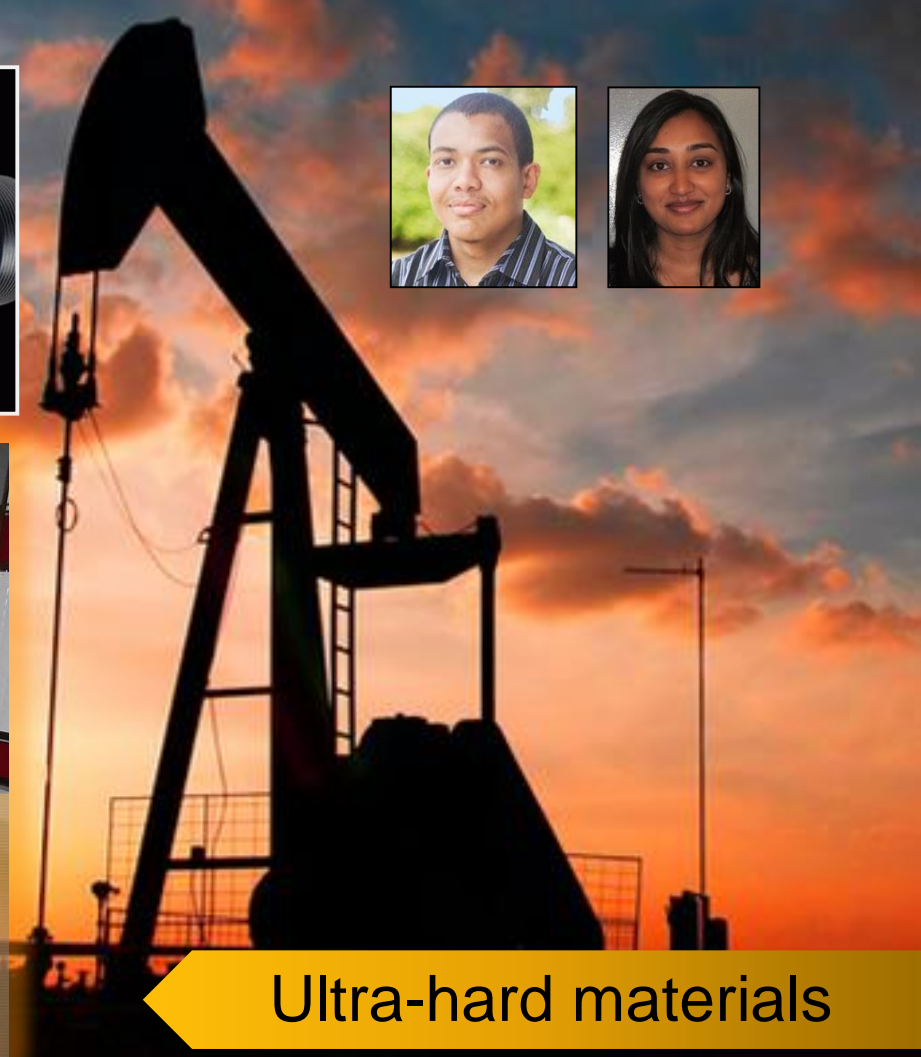
V



elementsix™



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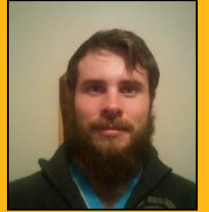
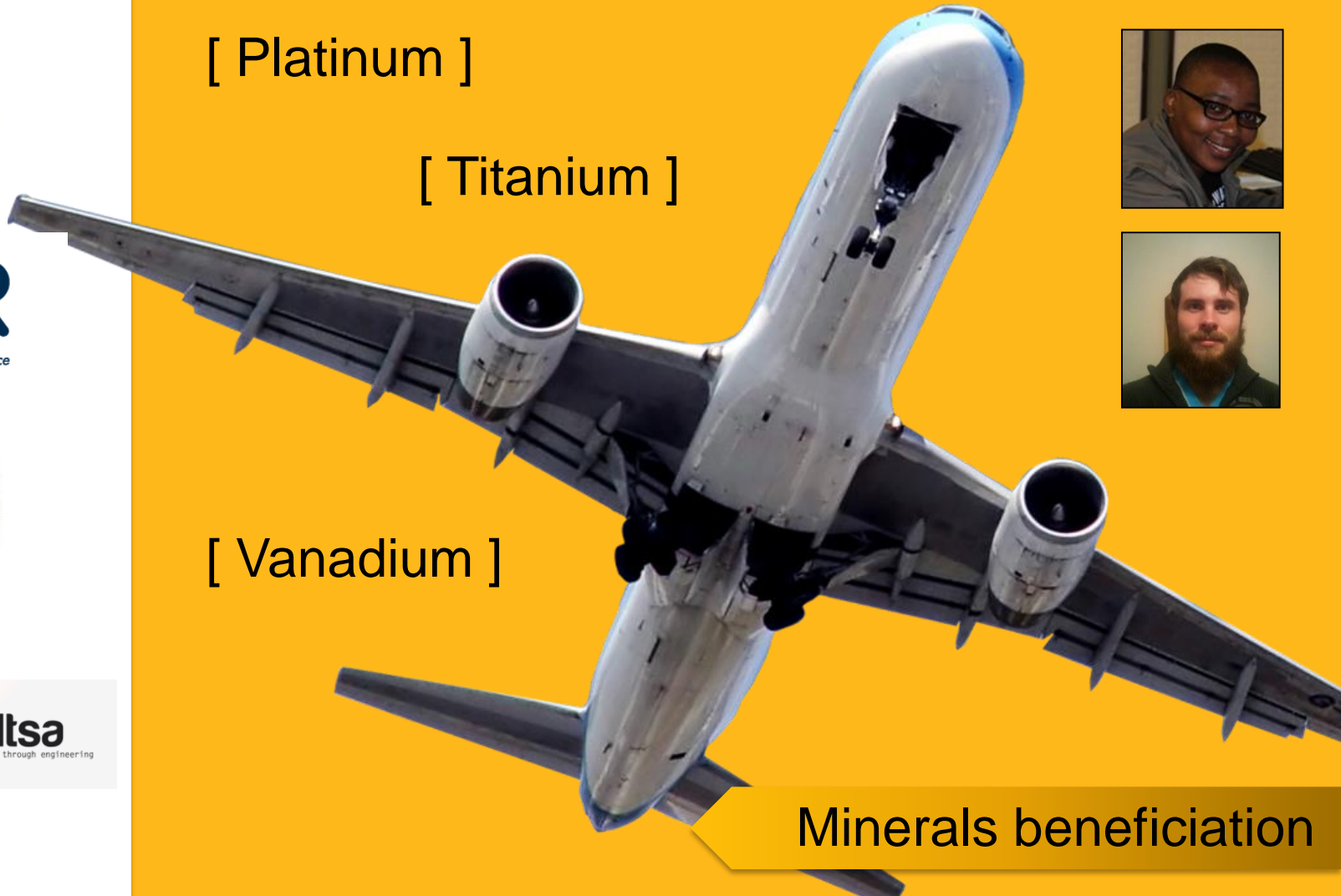
Ultra-hard materials



[Platinum]

[Titanium]

[Vanadium]



Minerals beneficiation

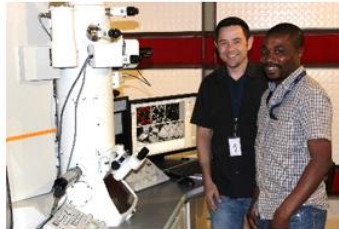
Over the last 5 years the Centre has provided operator training to over 60 postgraduate students, 11 industry members (Sasol, Eskom, Hulamini) and 22 operators from electron microscopy units across the country including UCT, the CSIR, UP, UKZN and Mintek.



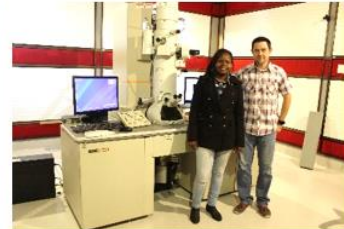
Training the next generation



Mr Velile Vilane (UCT)



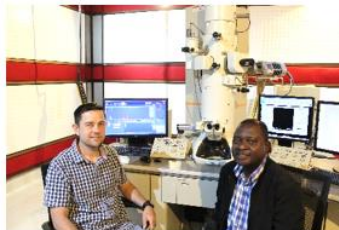
Dr Innocent Shuro (UCT)



Ms Phylis Makarunje (Wits)



Ms Mphahlele and Ms Lesufi are master students (UJ).



Mr Kofi Anan (UP)



Dr Vinod Kurup (UP)



Ms Melisha Jivanji (Element 6) and Mr Ettienne Minnaar (CHRTEM) doing research related to ultra-hard materials.



Mr Ryan Matthews (Eskom), Ms Genevève Marx (CHRTEM) and Dr Rodney Genga (Wits) at the annual MSSA conference prize giving 2016.



Prof Harry Bhadeshia and Ms Genevève Marx at the MSSA conference dinner 2017.

Outputs (2017)

10 Conference presentations

2 Journal Publications

2 MSc Graduates

4 Industrial reports

Acknowledgements



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

