Rhodes University
Chemistry Department
Graduation Newsletter 2017

Congratulatory message our HOD

This year's graduation will witness a remarkable 31 postgraduate students, 16 Honours, and 20 undergraduate students receive their degrees in Chemistry. Let me put that into perspective for the scientists out there – our average for the five years between 2007 and 2011 was 10 postgraduates, which increased by 50% (on average) for the 5 years to 2016, and this year has doubled from that.

It's hard to put Rand values to these numbers - the true value lies somewhere along a fine divide between societal and individual gain. For the South African Economy, each graduate means almost certain employment. The recent StatsSA Quarterly Labour Force Survey shows that the "share of unemployed graduates was minimal", especially "among black African and coloured population". The work of the Bureau for Economic Research confirms that true graduate unemployment has not risen much above 6% in the last 10 years, and that for those with a Masters degree or higher it's sitting near 3% currently – this in a country with youth unemployment at a shocking 50%.

South Africa awarded 14 000 M&D degrees in 2014 (CHE data), around 886 of those in "Physical Science" – who knows how many of those are in Chemistry, but I can well imagine that this year's contribution from Rhodes will bolster those numbers in some way. For me, however, that pales in significance compared to the effect on the personal lives of our students. I hope each of you can look at the terrible unemployment, poverty, injustice, and find a way to create the solutions the country needs in much the same way you created solutions to 31 different research problems.

Your impact on the Department has also not gone unnoticed: To Zane and Justin – we'll miss your zany (pardon the pun) boisterous personalities; Gugu, David, Banky, Edward, and so many others – your determination and willingness to assist in any situation will put you in good stead for the future. Congratulations to Munyaradzi, Oliver, and Arnold who have (mostly) kept their heads down and completed their research despite interruptions and protests. Many students have not only been working hard on their own research, but have been keen volunteers in the Department. I need to thank graduates like Victor, Ayanda, Maureen, Sindi, Zainab, Daniel, and Grace, who volunteered but with a smile, making us known as the friendly Department.

A few people always make a mark, and from this year's graduates I would like to single out a few: Lawrence, I learned a great deal from your deep sense of spirituality, thank you. Kelvin, your bravery in changing projects mid-stream to take on something that straddled the art/science/philosophy divide has opened up new directions for many others. Hilary, Mzi, Iviwe you are not forgotten, I remember each of you as somewhat shy, less than confident graduates, who have each blossomed in postgraduate studies – I look forward to reading about how you will change the world.

Thomas, Kristof and Eva, have mostly been out of the Department doing interdisciplinary research, but you have each left a mark; Thomas for your excellent work on modelling and informatics that continues to open new avenues for research, and Kristof and Eva as two M.Ed. graduates – we certainly need many more to follow your example, well done.

Christian and Christiana have been brilliant students, completing Masters in one year and PhD in two, respectively – clearly much smarter than me, so what more can I say – well done!

Bertha and Gervase, hats off to you. Both were full-time teachers when they started and they took on demanding postgraduate studies. Clearly the experience has not scared them off because both are still teaching, Gervase at Kingswood, and Bertha at Rhodes in the Extended studies and support studies, and both have recently started a PhD (and that is in addition being full time parents) – well done each of you, real role models.

Lastly, on the issue of teaching I also have to thank Marcel and Alicia, who taught in the department as replacement lecturers while some of their colleagues were on sabbatical. I sincerely hope the experience has made you consider a future as an academic, because despite all the bad news around at the moment, you and your fellow graduates are proof of Chemistry's remarkable resilience, immense creativity, and unwavering hope for the future.

I wish all our graduates success in the future! As always, I beg you not to forget about us and ask that you keep us informed of your adventures – come and visit soon and tell us all about it.

Best Chemistry Students for 2016

First Year:	Ms Lorraine Tariro Matandirotya	Wiley Book Prize
Second Year:	Ms Biana Rose Taylor	Wiley Book Prize
Third Year:	Mr Apelele Ntlantsana	Prize sponsored by Separations
Honours:	Ms Nthabeleng Regina Molupe	Prize sponsored by Sigma Aldrich
	Mr Urbain Nshokano Ndagano	Douglas Rivett Award
	Mr Otto Joseph	Prize sponsored by SACI 2016 for Chemistry Department Communicator of the Year

2017 Masters and PhD Graduates

1 Mr Zane Watkins MSc S22

Zane Watkins was born in Pretoria, lives in Cape town and was raised in Grahamstown. Very much a local boy, Zane loves the outdoors and small town living. As a scientist, Zane loves pushing the limit of conventional methodologies and always questions the status quo. He recently returned from Hong Kong with a renewed passion and hunger for innovation and hopes to invest his time and optimism in the economy of South Africa by starting his own Chemical innovation laboratory.

The title of Mr. Watkins' Thesis, "Photophysical studies of conjugates of upconversion nanoparticles with aluminium phthalocyanines", sought to combine the properties of upconversion nanoparticles (UCNP) with those of aluminium phathalocyanines (AlPc). The UCNP's absorb low energy light while AlPc's have been used to treat certain kinds of cancer. By combining these properties Mr. Watkins had hoped to further the research towards low light, deep tissue and non-invasive anti-cancer treatments.

2 Ms Gugu Kubheka MSc (with distinction) S22

3 Mr Justin Stone MSc (with distinction) S22

Justin Stone, was a chemistry student at Rhodes University where he studied towards an MSc under the supervision of Dr Mack and Prof Nyokong. He is an Eastern Cape local (born in EL) and his passion for chemistry started in school after attending the Grahamstown Science festival (Scifest). Like many of our graduates, he is the first in his family to earn a post-graduate degree. After graduating from Rhodes he has been employed as a junior production scientist at the Stellenbosch Nanofiber Company (SNC), where he is currently working on a wide range of nanofiber based projects and technologies.

"*The title of my MSc thesis is: Synthesis and Photophysical Studies of Crown Ether-BODIPY Dyes and the Fabrication of BODIPY Embedded Fluorescent Nanofibers.*

My thesis had study has three major objectives: 1) to synthesize a series of structurally related BODIPY dyes, 2) to fabricate BODIPY embedded electrospun nanofibers, and 3) to investigate and characterize the photophysical properties of all synthesized BODIPY dyes with a special focus on their ability to generate singlet oxygen. First, the acid catalysed condensation reaction to produce two structurally analogous meso-substituted BODIPY dyes based on cuminaldehyde and 4-dimethylaminobenzaldehdye was explored. In order to enhance the rate of ISC and promote the generation of reactive oxygen species bromine atoms were then attached to the BODIPY 2,6-positions. These BODIPY dyes were then embedded in a polystyrene solution and electrospun into nanofibers. The resulting nanofibers were found to be highly fluorescent, but were

no longer able to generate singlet oxygen. Ion-sensitive BODIPYs were prepared from the dibrominated BODIPY dyes by employing a modified Knoevenagel condensation reaction to form a styryl bond with 4'-formylbenzo-15-crown-5 at the 3,5-position of the BODIPY core. Changes in the morphology and position of the absorption and emission spectra of these crown ether-styryl BODIPY dyes were observed in the presence of sodium ions. These results imply that crown ether-substituted BODIPY dyes could function as ion sensors."

4 Mr David Oluwole PhD S22

Oluyinka David Oluwole was born and raised in Lagos–Nigeria. He completed his Doctor of Philosophy degree in Chemistry in 2016 at Rhodes University under the supervision of Dist. Prof. T. Nyokong. His research focus was on the design and development of dyes and nanoparticles (NPs) for photodynamic therapy and nonlinear optics.

Photodynamic therapy is a treatment regimen for cancer which is dependent on photosensitizer (Dye), light and molecular oxygen in order to elicit its pharmacological response. On the other hand, nonlinear optics (NLO) is a branch of optics that deals with study of how intense light interacts with matter. NLO materials are molecules (Dye) capable of preventing high amplitude light from damaging optical materials (eyes). Prior to my PhD degree, I had my BcH (Honours) degree with 2nd Class Upper Division in Industrial Chemistry and M.Sc degree with Distinction in Pharmaceutical Chemistry with specialization in Pharmaceutical Analysis and Pharmacokinetics. In 2013, I spent 2 weeks in Philadelphia (Pennsylvania, USA) where I received further training on Pharmaceutical Analysis and in 2015, I had the opportunity to spend 3 weeks in Moscow (Russia) where I received training on synthesis of mononuclear and multinuclear dye molecules.

Currently, I am a Postdoctoral Research Fellow in RU/DST Nanotechnology Innovation Center c/o Department of Chemistry, Rhodes University. My current research focus is on design and development of novel mononuclear and multinuclear dye molecules and their plausible attachment to NPs for PDT and NLO.

5 Mr Olawale Osifeko PhD S22

Lawrence Olawale Osifeko was born on the 1st of April 1977 at Epe in Lagos state, Nigeria West Africa into the Osifeko family.

I attended a Roman catholic primary school (RCM) and Nazareth, college both in Ibonwon (my home village). I had my tertiary education at Lagos state University and University of Ibadan respectively for bachelor of science in chemistry and master of science in Environmental Chemistry and Pollution control.

I am a happily married man with three lovely daughters and a studious, dependable, caring, lovely and God fearing wife. I am working in Lagos state university as an academic staff at the chemistry department and was on staff development/training at Rhodes University.

The quest for quality, inclusive and international exposure lure me to search, seek and gain admission to Rhodes University under the supervision of world renown distinguished scholar; Prof. Tebello Nyokong for my PhD in chemistry in 2013. The title of my PhD thesis is Synthesis of indium and lead phthalocyanine as photocatalysts for photodynamic antimicrobial chemotherapy and photo-oxidation of pollutants.

Rhodes University was to me a home away from home and I am glad that I come, seek, found, secure and obtained the degree.

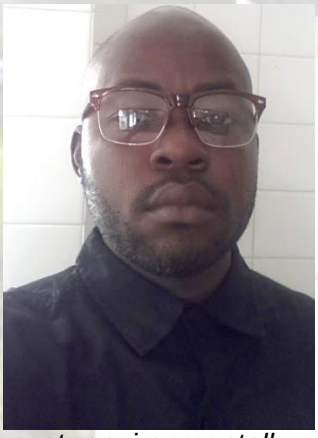
6 Mr Edward Sekhosana PhD S22

Kutloano Edward Sekhosana is a postdoctoral research fellow in Prof. Nyokong's laboratory (S-22) whose current research focuses on blue lanthanide phthalocyanine forms for improved optical limiting.

I also did my PhD under Prof. Nyokong's supervision, with the main focus on multi-decker phthalocyaninato lanthanides, monomeric, dimeric and trimeric phthalocyanines alone and or in the presence of a selection of nanomaterials such as graphene oxide nanosheets and nanoparticles (amongst others) for optical limiting.

Nanomaterials such as zinc oxide nanoparticles (ZnO NPs), multi-walled carbon nanotubes (MWCNTs) and graphene oxide nanosheets (GONS) (oxidized and reduced) were employed for covalent linkage to mono- and binuclear phthalocyanines as conjugates. Optical limiting properties of lanthanide Pcs alone and as conjugates in solution and when incorporated into polymers were determined by employing a Z-scan technique. It emerged that low symmetry lanthanide Pcs, the blue forms of bis(phthalocyanines) (only in solution) as well as tris(phthalocyanines) exhibit low limiting threshold (Ilim) values in solution and thin films. The low limiting threshold values make these lanthanide Pcs reliable optical limiters.

7 Owolabi Bankole PhD S22



Bankole Owolabi Mutolib, was born in Lagos (Lagos State, Nigeria). He completed his undergraduate studies at Adekunle Ajasin University, Nigeria, in Industrial Chemistry with First Class division (BSc Honours) in 2009. In 2011, he completed his MSc. degree (Pass with Distinction) in Physical Chemistry at the prestigious University of Lagos, Nigeria. Then, proceeded to Rhodes University for his doctoral research program under the supervision of Dist. Prof. Tebello Nyokong between 2014-2016. During his doctoral research, he looked into the design, synthesis and characterization of novel phthalocyanine-nanomaterials (or polymer) composites for nonlinear optics applications. Over 8 manuscripts were published in reputed scientific journals from his PhD thesis titled "*Nonlinear optical responses of phthalocyanines in the presence of nanomaterials or when embedded in polymeric materials*".

I'm currently into independent research with keen interest in developing low-cost, environmentally-friendly and reusable heterogeneous nano-catalysts.

8 Munyaradzi Shumba PhD S22

9 Kelvin Kelly MSc S4/F38

10 Arnold Amusengeri MSc S4

11 Olivier Sheik Amamuddy MSc S4

12 Thommas Musyoka PhD S4

13 Grace Ngubeni MSc (with distinction) F4

Grace Nomthandazo Ngubeni is from Soweto in a township called Jabulani.

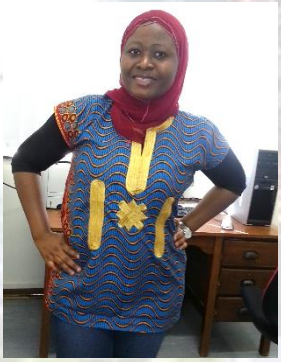
By God's grace I have been raised by both parents with my four siblings. My role models are my parents – they are such hard workers and are very committed to what they do no matter how big or small the task at hand is. They teach and inspire me to be equally dedicated and committed to any task I engage myself in. My sister – she has shown such tenacity in reaching for her dreams and desires. She is a qualified Chartered Accountant who has worked so smartly to get to where she is. She is a go-getter who always puts so much passion into all that she does. She inspires and encourages me to always thrive. Above all my family and friends have been my biggest cheerleaders (people who support, encourage and assist), whom I am ever so grateful to have in my life.

I studied at Rhodes University where I completed my undergraduate and postgraduate studies (i.e. Honours and MSc) by 2015/2016. I am currently a PhD Candidate at the University of the Witwatersrand in the field of Chemistry focusing on Nanomaterials. I am a born

again Christian who enjoys the sciences and loves Christ Jesus with all my heart. I enjoy meeting new people and appreciate tackling different challenges in life. I am a team player who enjoys working with people to achieve a common goal. Netball and volleyball are my favourite sports however; volleyball has become my most favourite sport of the two.

One of my aspirations is to use my knowledge and skills as a professional by giving back to the community and hopefully inspire more young ladies to pursue science in the future.

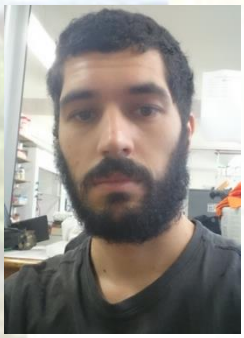
Grace's Thesis/Dissertation Title *is "Spectroscopic and nonlinear optical characterisation of alpha substituted binuclear phthalocyanines".* The main focus of her thesis was to study the properties of phthalocyanine and binuclear phthalocyanine complexes for application as possible nonlinear optical material.



14 Zainab Makinde MSc (with distinction)
F4

Makinde Zainab is from Nigeria. She enjoys watching movies, reading and sleeping (essential for post-graduates!). She is a positive and enthusiastic graduate who appreciates a challenge.

I had a great time working under the tutelage of Dr Khene as a master's student where I worked on the spectroscopic and electrochemical characterization of binuclear phthalocyanines. I see myself doing a PhD in a related field and also have my very own research laboratory.



15 Marcel Louzada MSc
F4

I am a strguggling chemist, fond of coffee and cake.

My thesis title was: "Nonlinear Optical Properties of Sn(IV) phthalocyanines: Experimental and Theoretical Approach"

In this study, the Nonlinear responce for a series of SnPcs was examined. A theroreticla model was developed to accuratelly deterime their excited state properties and account for reverse saturable absorption in order to accurately calculate thier two photon absorption cross-section.

16 Sindisiwe Mvango MSc F4/F3

17 Victor Hakizimana MSc F22

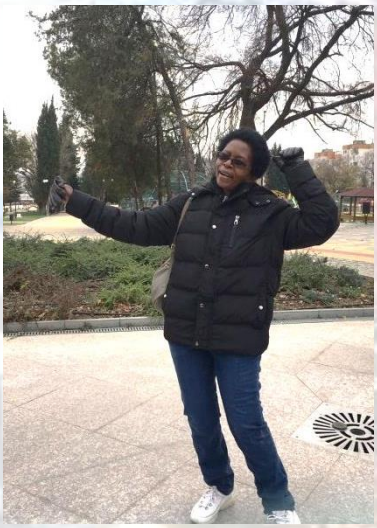
Emmanuel Victor Hakizimana is Rwandan and is a lecturer from INES-Ruhengeri/Rwanda. He completed his MSc at Rhodes University (**2016**) under the supervision of Dr Khanye, following his Bachelor of Science with honors at University of Rwanda (**2010**).

*I am interested in organic and environmental chemistry. My **Master of Science Thesis title is** "Synthesis, characterization and evaluation of novel ferrocene-thiazole blends as antiplasmodial agents." When I am not busy with my academics, I enjoy playing basketball.*

18 Bertha Chithambo MSc F22

I am very grateful to a lot of people who have helped me in different ways to achieve this MSc. Prof Rui Krause, my supervisor, thank you for accepting me as a member of your expansive group. Dr Xavier Siwe Noundou, thank you for the endless support and feedback throughout this research. Thank you to all members of the Chemistry Department, both academic and technical staff. Thank you to all F22 members for the friendship and support. My friends and family, thank you for pushing me on and encouraging me to keep on going when I thought I couldn't manage. Makaiko, my husband and my children, thank you for the continuous supply of chocolates to boost my morale and all the encouragement and support.

The title of Mrs Chitambo's thesis was "Antimalarial secondary metabolites from *morinda lucida"*



Antimalarial activities of secondary metabolites from *Morinda lucida,* a member of the Rubiaceae family, were investigated. In this study, the methanolic crude extract from the bark of *M. lucida* was fractionated and different fractions purified in order to isolate secondary metabolites. The isolated compounds were characterised and identified. *In vitro* antimalarial, antibacterial and antituberculosis assays were carried out on the crude extract, fractions, isolated compounds and solutions made from different combinations of pure compounds. The methanolic crude extract (at 100 µg / mL) reduced the malaria parasite viability to 0 % and was not cytotoxic - as determined using a cell toxicity assay against HeLa cells, which gave a cell viability of 100 %. The following compounds, comprising of iridoids (asperuloside and asperulosidic acid), terpenoids (stigmasterol, β-sitosterol, campesterol, lanosterol and cycloartenol) and an anthraquinone, 5,15-*O*-dimethylmorindol, were isolated.

19	**Hillary Ezuruike**	**PhD**	**F22**
20	**Gervase Makoni**	**MSc**	**F22**
21	**Ayanda Zulu F22/G3**	**MSc**	

Ayanda Zulu was born in Vryheid KwaZulu-Natal on the 14th of April 1993. She completed her matric in 2010 at Vukuzakhe high school in uMlazi Township and enrolled at the University of Fort Hare where she obtained her BSc degree in 2013. She then went on to obtain her BSc honours (Cum laude) in Chemistry in 2014. She then completed her Master's degree at Rhodes University under the supervision of Dr SD Khanye and Dr C Veale with the thesis title "Synthesis and evaluation of arylpyrrole-chalcone hybrids as antiplasmodial and antitrypanosomal agents". In this project, a number of compounds were synthesised and evaluated against Plasmodium falciparum and trypanosoma brucei brucei strain where most compounds showed activity against trypanosoma brucei brucei.

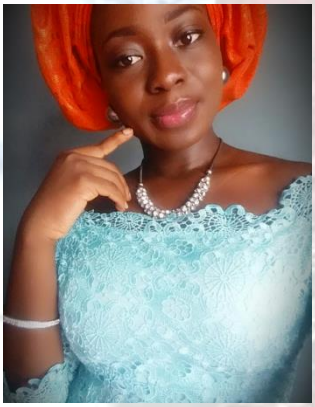
22	**Mziyanda Mbaba**	**MSc**	**F22**
23	**Maureen Gumbo**	**MSc (with distinction)**	**F22**
24	**Christian Nkanga Isalomboto**	**MSc**	**F22**

Christian Nkanga Isalomboto is from the Democratic Republic of the Congo, where he completed his undergraduate studies in Pharmaceutical Sciences (BPharm) at the University of Kinshasa in 2014. His research interests include both Drug Discovery and Drug Delivery for poverty related diseases, which is the field he chose for his master's research in Medicinal Chemistry.

I have conducted my MSc research under the profound guidance of Professor Rui Krause. My MSc thesis was entitled: Inhalable particulate systems for anti-tubercular drug delivery. This research has successfully proposed a novel nano-sized delivery system to overcome limitations associated with current medicines to treat tuberculosis. The work was also focused on addressing the critical issue of using cost effective materials to ensure economical availability and affordability of nanomedicines.

25	**Iviwe Nokalipa S3/S4/S29**	**MSc**	
26	**Christiana Adeyemi S3/S4/S29**	**PhD**	

Christiana Modupe Adeyemi is a Nigerian from the middle belt. She is a diligent scientist who completed her MSc and PhD at Rhodes University in 2016.



She obtained her BSc Hons from Obafemi Awolowo University Ile ife in Nigeria. Her postgraduate studies (MSc and Ph.D degree) in Organic synthesis/Medicinal Chemistry were completed in 3 years from Rhodes University Grahamstown South Africa, under the supervision of Emeritus Prof Kaye, and co-supervised by Prof Krause for MSc and Drs Lobb & Klein for Ph.D.

My Ph.D thesis titled the synthesis and biological screening of potential plasmodium falciprum DXR inhibitors, gave an output of over 160 antimalarial compounds, 119 of which are novel. Some of these novel compounds also served as anti-trypanosomal agents (sleeping sickness).

These research findings have produced at least 5 peer reviewed academic articles, 2 of which was published in Bioorganic and Medicinal chemistry and Tetrahedron journal respectively.

27	**Alicia Singh**	**PhD**	**S3/S4/S29**
28	**Omobolanle Jesumoroti**	**PhD**	**S3**

Jesumoroti Omobolanle Janet graduated from the University of Agriculture, Abeokuta, Nigeria in 2002 with a B.Sc (Honours) in Chemistry. In 2005, she received her M.Sc in Organic Chemistry from the University of Ibadan, Nigeria. After completing her masters, she decided to broaden her knowledge by working as a Chemistry Demonstrator and as a lecturer in the University. Her strong interest in medicinal organic Chemistry research brought her to Rhodes University for a PhD position under the sponsorship/award of Organization of Women in Science for the Developing World (OWSD) in September 2013.

Her PhD title focuses on the Synthesis and biological evaluation of anti-HIV-1 integrase agents. Jesumoroti O.J presents a substantive amount of research into the design of experimental protocols for the synthesis of HIV integrase drugs- an attractive target for therapeutic intervention in the treatment of HIV/AID. She extended her study to the molecular modeling as well as biochemical evaluations of the synthesized drugs.

The results from her study provided an efficient platform for the discovery of potential HIV-1 integrase inhibitors in which two bioactive scaffolds have thus been pioneered as lead HIV -1 integrase inhibitors, thereby providing a significant contribution to the development of HIV-drugs.

From the research conducted, three articles have been drafted and one under review for publication. The candidate has presented her results at national conferences, as well as at an International Organic Symposium, held at the University of Maryland.

29	**Daniel Mwanza**	**MSc (with distinction)**	**F3**
30	**Kristof Nikodemus**	**MEd**	**F38**
31	**Eva Asheela**	**MEd**	**F38**

SACI Regional Seminar 2016

The annual regional post-graduate chemistry seminars took place on Friday 28 October at Rhodes University. There were approximately 100 post-graduate students and staff from Chemistry Departments of the four Universities in the Eastern Province gathered together to listen to the latest Chemistry Research being carried out at the various universities. The participating universities were: Rhodes, Fort Hare, Walter Sisulu and the Nelson Mandela Metropolitan University.

Professor Rui Krause (chairperson of SACI EC) welcomed the staff and students and encouraged students to become members of the South African Chemical Institute. Professor Krause presented the SACI Postgraduate Medal to students.

The seminar programme included a Junior and a Senior Section, and they were chaired by Dr Klein and Dr Mashazi from Rhodes University.

The *1st prize* in the Junior category event went to **Aidan Leigh Battison** from **Nelson Mandela Metropolitan University** for his talk on *Synthesis of fluorescent polymer containing hydroxy-coumarin-triazole pendant groups and the subsequent complexation studies with Hg(II).*

The *2nd* prize in the Junior category went to **Zandile Mhlwatika** from **University of Fort Hare** whose topic was *Design of carbopol/soy protein isolate based hydrogels for dual delivery of antimalarials.*

The *1st prize* in the Senior category event went to **Tafadzwa Murinzi** from **Rhodes University** for her talk entitled *Electrocatalytic detection of L-cysteine using Mo-POM doped $Cu_3(BTC)_2$ metal organic frameworks.*

The *2nd* prize in the Senior category went to **Cloudius Sagandira** from **Nelson Mandela Metropolitan University** whose topic was *Exploring acyl azide chemistry using micro reactor technology: An overview.*

This event was very successful, but it we could not have achieved this without our sponsors. We would like to thank Aspen Pharmacare and Perkin Elmer for the donations toward prizes.

New Postdoc

I am Richard Mbi Beteck born on 8th June 1988 at Ntenmbang, a small village in the South West region of Cameroon. After completing primary school, I attended Government High School Tinto, where I obtained the general certificate of education ordinary level (OL) in 2005. In the years which followed, I attended Cameroon college of Arts and Science (Kumba), where I obtained a general certificate of education advanced level (AL) in 2007.

From 2007-2010, I attended University of Buea and earned a Bachelor of Science degree (BSc Hons) in Biochemistry. In 2011, I was awarded a scholarship to undertake master's studies under the Master's degree program for research chemist

(https://www.uef.fi/en/web/reschem). During this program, my research focus was medicinal chemistry and I learned a lot with regards to drug design, drug metabolism, drug receptor interaction and lead optimization, and analytics (NMR, MS, FTIR, X-Ray).

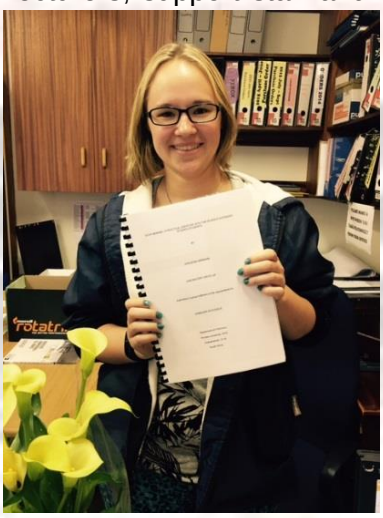
My master's project involved synthesis, surface modification and characterization, and *in vitro* and *in vivo* evaluation of mesoporous silica as applied to cancer specific drug delivery. After master's, I was interested in finding solutions for infectious tropical diseases such as Malaria, Tuberculosis, sleeping sickness, river blindness using synthetic medicinal chemistry. This led me to register as a PhD student at North-West University, Potchefstroom campus under the mentorship of Prof. Richard Haynes, who at the time was awarded an MRC flagship to develop triple drug combinations for the treatment of TB, Malaria and related diseases (http://www.mrc.ac.za/strategic/flagship.htm). This project gave me the necessary experience for full scale drug discovery.
I am currently a Postdoctoral research fellow in Dr Khanye's Laboratory, in the department of Chemistry, Rhodes University. The research I am currently pursuing is centred on the design and synthesis of multi-functional ligands to treat multi-drug resistant TB, malaria and other related infectious diseases.

Honours year in a nut shell

The honours degree is jam-packed with activity from the start! From organising the Chemistry Society events to choosing courses to study throughout the year. It certainly was not a gradual introduction! I am sure that I can speak for my entire class when I say that it was quite a shock to the system to realize that honours was as involved as it was, in comparison to third year. However, we adjusted and found our equilibrium for maximum efficiency.

It was a tough year but undoubtedly a fruitful and enriching year for all of us. I, for one discovered my love for Science Communication and teaching by studying Service Learning and doing Chemistry Education as a project. I should also mention that tutoring for first years and getting involved in Khanya Maths and Science Club played a vital role. Others found their true niches in research, or in some cases what was not a true niche!

Through all of the work that was expected of us, we grew closer together and dare I say we became friends and not just classmates. We do have to acknowledge our relevant supervisors, lecturers, support staff and of course Dr Klein (our course coordinator). Thank you for all the work you put into last year! Our last minute exam venue was very much appreciated and I think preferred by all, including staff.



Ultimately, an excellent curriculum that every Chemistry student should aspire to do but a few parting words– wholeheartedly commit to this course at the beginning to reap the benefits because if you do not, you may end up with the short hand.
Written by Ashleigh Grinham (2016 Honours student)

Welcome to our incoming Honours Students of 2017

I would like to welcome our Honours class of 2017. We have a few of our very own past Rhodes students joining us and a few new students who will become part of the Rhodes family.

This year is going to be tough… nothing worth fighting for is ever easy…So, I encourage you to stick to your academic plan and take pride in the classes you have chosen to complete your degree. If you have an academic-related problem, seek help from your supervisor, course coordinator or even just someone in the lab.

Your time here, and what you make of it, will serve you well during your lifetime, and ensure you will be able to look back and say to yourself, “My time here was not wasted!”

And finally, take opportunities that our multi-cultural campus provides. Please consider volunteering in Community Engagement Projects as the need is there for you.

With warm regards,
The Chemistry Department

New PhD student in the Department

I am **Teresa Manuel Cossa**, I was born in Maputo (Mozambique) in 1984. I was married last year and now I have a lovely, quiet little baby who is only 5 months old. My husband lives in Maputo.

From 2005 to 2008 I did my Bachelor and Honours Degree in chemistry in Mozambique at Pedagogical University, and then I started working as a teacher at a High school from 2009 to 2012. From 2012 until now I am lecturer at Pedagogical University (Mozambique). From March 2013 to February 2015 I did my Master Degree in Brazil at Universidade Federal da Grande Dourados (UFGD) -Mato Grosso do Sul.

My experience is in organic synthesis. During my Masters, I did Synthesis, characterisation and biological activity of ligands and copper (II) complexes for mosquito control (Dipetera Culicidae), and I had experience with creation, maintenance, evaluation of bioactivity of immature and adult stages of mosquitoes and organizing reference collections for major species of mosquitoes vectors of human diseases from Fiocruz – Instituto Oswaldo Cruz -Laboratório de Diptera - Rio De Janeiro (http://portal.fiocruz.br/en/content/home-ingl%C3%AAs) and UFGD Entomological Laboratory. The experience includes 5 short curses for vector maintenance and bioassays bioactivity.

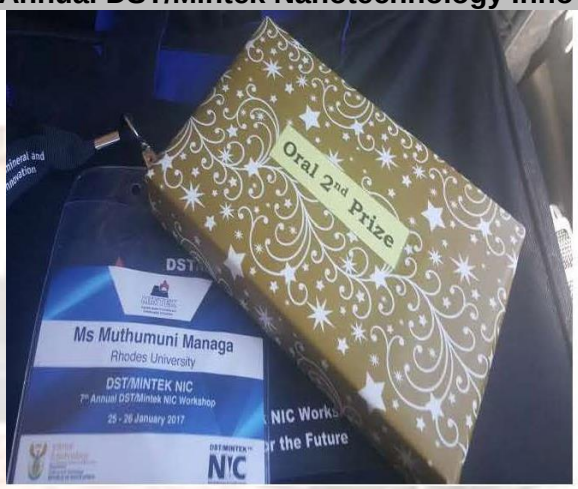
I also have experience with purification of natural products such as cashew nut shell liquid (CNSL) and this purification give us a Patent: *efficient process of purification of the Cardanol isolated in cashew nut shell*

liquid (CNSL) and production of derivatives of industrial interest (translated from Portuguese). Process number**:** *BR 10 2014 0300023*.

In Mozambique I am working with a project related to evaluation of the resistance of insecticide used for malarial vector control.

At Rhode University I am PhD student and my proposal work is in green Organic Medicinal synthesis with Dr Klein as supervisor and Prof. Krause as co-supervisor.

7th Annual DST/Mintek Nanotechnology Innovation Centre (NIC) Workshop



This year the NIC Workshop took place at the Medical Research Council of South Africa (MRC) in Cape Town from 25-26 January.

Delegates from Rhodes included Distinguished Professor Tebello Nyokong and Dr Sam Khene (staff members); Ms Muthumuni Managa, Ms Refilwe Matshitshe and Mr Marcell Louzada (Doctoral students); Ms Azole Sindelo and Ms Sivuyisiwe Mapukata (Masters Students); and Mr Yogesh Maurya and Mr Yuto Kage (exchange students from Japan).

All students from Rhodes presented at the Workshop and Doctoral student, Ms Muthumuni Managa won 2nd prize for her oral presentation entitled "*Development of Nanoconjugates of Pluronic Silica Nanoparticles with Porphyrins for Photocatalysis*".

The DST/Mintek Nanotechnology Innovation Centre (NIC) is a national facility. The facility was established in 2007 with the goals of undertaking and coordinating research activities. DST/Mintek NIC, collaborative includes Rhodes University, University of Western Cape and the University of Johannesburg undertaking and coordinating research activities in sensors, biolabels and water respectively. DST/Mintek NIC holds annual workshops where students from the three universities converge to present their current research work.

FameLab 2017

Otto Joseph, a masters student in the Chemistry department was a semi-finalist in the 2017 Famelabs science communication competition.

Well done Otto! We are very proud of you, and hope you enjoyed the time in Johannesburg representing the department and Rhodes University.

South Africa's researchers in science, technology, engineering and mathematics have shown us their excellent public speaking and science communication skills during FameLab SA 2017.

In each heat, contestants were asked to convey a scientific concept of their choice in 3 minutes to a panel of judges including leading researchers, media personalities and science policy makers. They were judged on the content, clarity and charisma of their presentations.

Congratulations to all the winners - who move on to masterclasses at the British Council with UK-based broadcasting journalist Quentin Cooper and Jive Media Africa's Robert Inglis and Sthabile Mazubane.

RHODES UNIVERSITY
CHEMISTRY DEPARTMENT
2016

Back Row: Mr R Douglas, Mr N Kota, Mr C Nkanga Isalomboto, Mr M Mkatali, Ms A Adewumi, Mr O Osifeko, Mr V Chitsa, Mr OD Oluwole, Mr M Ngoepe, Mr N Nwahara, Mr E Sekhosana, Mr L Lekokotla, Mr A May, Mr O Achadu, Ms K Botha.

Fourth Row: Mr G Makalima, Mr M Mbaba, Mr F Bokosi, Ms S Mapukata, Mr A Omotayo, Mr H Keulder, Ms A Adesina, Mr C O'Donoghue, Mr V Moses, Ms A Njumbuxa, Mr L Sigauke, Ms A Grinham, Mr S Sekgota, Ms T Tshiwawa, Dr N Pitchou, Mr J-P Kayembe, Ms R Mashitse, Ms B Chithambo, Mr R Mageza

Third Row: Ms S Peteni, Mr M Mkatali, Mr D Mafukidze, Ms V Mthantalala, Ms N Molupe, Mr A Sarron, Ms J Taylor, Mr T Mtshare, Mr A Ayeni, Mr K Kelly, Ms J Harris, Ms M Managa, Ms K Kapikara, Dr G Fomo, Ms N Gojela, Ms V Makabe, Mr T Nkaki, Mr O Joseph, Ms K Maedza, Mr S Siewetsha, Mr S Sukula.

Second Row: Ms A Zulu, Ms N Ndebele, Ms S Mvango, Mr O Oderinlo, Ms N Shwempe, Mr M Louzada, Mr A Saba, Mr M Shumba, Ms E Sebata, Ms N Grootboom, Ms G Kubheka, Ms R Nkhahle, Ms J Jesumoroti, Mr M Manyeruke, Ms C Adeyemi, Ms Z Makinde, Mr V Dondashe, Ms N Mbebe, Mr KA Oluwaferni, Mr G Matlou

First Row: Mrs B Tarr, Dr R Klein, Dr SD Khanye, Dr P Kempgens, Dr K Lobb, Dr J Britton, Ms G Cobus, Mr A Adriaan, Prof R Krause, Prof G Watkins, Prof T Nyokong, Dr PN Mashazi, Dr S Khene, Dr J Mack, Ms A Williams, Mrs J Sewry, Mr M Mafani

Dr Khene's achievement and HOPE meeting with Nobel laureate

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Natural and Agricultural Sciences
Forestry and Agricultural Biotechnology Institute

Dear Dr. Khene

Selection as a fellow of the Africa Science Leadership Programme

It gives me great pleasure to confirm that you have been selected as a fellow of the Africa Science Leadership Programme (ASLP).

Congratulations on this significant achievement. The programme received a large number of strong applications from across the continent. Following two rounds of assessment by an international panel and the ASLP management team, your application stood out. We have an exciting group of fellows and look forward to engage with you in this ground breaking program.

Dr Khene was selected amongst many applicants from South African universities to attend 9th HOPE meeting with Nobel Laureates held in Tokyo Japan from February 26 to March 2, 2017. Only two people in the whole of South Africa where selected. Dr Khene joined 110 young scientists from the Asia-Pacific and African regions. He had the opportunity to attend lectures and discussions by Nobel laureates and time to network with other scientists from the regions.

HOPE Meetings are aimed at fostering talented young researchers who have wide perspectives that transcend individual disciplines and lofty values derived from the region's inherent cultures. To foster such researchers, HOPE Meetings have been organized by the Japan Society for the Promotion of Science since 2008. The title "HOPE" signifies the promise held for young scientists and optimism for a bright science and technology future in the Asia-Pacific and Africa region.

HOPE Meetings give opportunities for excellent doctoral students and young researchers selected from countries/areas in the region to engage in interdisciplinary discussions with Nobel laureates and other distinguished scientists. Their programs include dialogue with distinguished scientists pioneering the frontiers of knowledge; exchanges among the participants themselves, who live under the same roof for one week; and cultural lectures and activities.

Ms Williams' ABE Bailey Trip…

Ms Alyssa Williams is part of the departmental team and a master's student in the faculty of Commerce.

On November 22nd 2016, I embarked on a journey that I knew would change my life forever…

In 2016 I was awarded the ABE Bailey Travel Bursary. Out of 2500 candidates that were screened, my application must have stood out from the rest. I was one of 18 students who got to go on amazing adventure.

I never ever imagined that I would have been awarded this opportunity. I saw the email from the post-grad funding office yet didn't apply until the last minute. I was short-listed, went for an interview (where my panel was chaired by Dr Mabizela himself and consisted of the Deans of each faculty – Scary!), and here I sit today with this on my CV.

The highly structured tour started with a 3 day orientation in Cape Town (which I've never been to - went to Robbin Island and visited Sir Abe Bailey's grave site), followed by a 2 day stay in Ethiopia where we got to experience what it is like to be in another African country and visited the African Union headquarters where we sat in on a debate. Finally, we flew out to London. This is where we were exposed to proper British culture.

Some of the activities on our itinerary included: Theatre shows (*Matilda* at the Cambridge Theatre,

Aladdin at Prince Edward Theatre, *Les Miserables* at the Queen's Theatre, and *The Tempest* at the Royal Shakespeare Theatre) as well as the *Kings College Choir*, at the Royal Albert Hall; Watching the guard change outside the Palace; Tour of the Houses of Parliament; and Westminster Abbey; a visit to St Paul's Cathedral; Stonehenge and the Roman Baths; National Gallery; Cambridge University; Kings College Chapel; Oxford University; Stratford-upon-Avon touring Shakespeare's family home; going to Edinburgh, and a whole lot more.
I have met so many people: previous Abes, South Africans studying in the United Kingdom, individuals of high influence within the United Kingdom and beyond. I would never have even gotten close enough to know these people if it was not for the bursary. Students from two of the most prestigious universities in the world were in contact with us and they made all of us aware that we are more than good enough and prepared enough to attend such universities if we wanted to.

As much as we had all this fun, we also had to present on contemporary issues facing South Africa at the present moment. I presented on Financial Education/Literacy of our Youth to overturn the poverty cycle. Some other topics were on: Human trafficking; Social Engineering; Patient's Rights Charter; Media Diversity; Drug addictions; Letting go of historic identification; Challenges the South African Education system faces; and so on.

New Equipment – MASS SPECTROMETRY and SOLID-STATE NMR

It seems Chemistry cannot stand still and we have yet another new piece of important equipment arriving soon. Our department will soon be home to a new Bruker Time-of-Flight Mass Spectrometer. We already have a MALDI instrument that can handle solids, so this is a perfect complement for the liquids-based samples.

Secondly, Prof Krause recently attended a course on Solid-State Nuclear Magnetic Resonance (NMR) at the Bruker facility in Rheinstetten. This will now allow us to perform some much needed Magic-Angle-Spinning experiments using solid-state NMR, and by the look of these recent requests this is not a moment too soon – take a look:

Requests include hydrogels from UFH, catalyst complexes from WSU, some silicon nanoparticles used in drug discovery, lignocellulose fibres, pharmaceutical polymorphs of drug complexes, information on the dyes used in old wall-paper, and the coating on a beetle's wings.

Past Student News

I am Dr Stephen Nyoni. I graduated with a PhD in Chemistry (2016) under the supervision of Dist. Prof. T. Nyokong. I am currently an Analytical Chemistry lecturer in the department of chemistry at Chinhoyi University of Technology, Zimbabwe and a recipient of the 2016 Golden Key International Honour. I am also excited about being a co-supervisor of my first PhD student in the field of Li-ion batteries.

Although my PhD thesis was focused on electrocatalysis by nanomaterials for sensors and fuel cell development, I have thought of expanding my research focus towards another angle of nanomaterials i.e. sustainable and green synthesis of nanoparticles using some targeted locally based indigenous plant extracts of known medicinal applications. Our chemistry department is still very young (3 years) but through my experience from the chemistry department at Rhodes University and S22 in particular, I look forward to take it to unprecedented heights in the near future in terms of both academic and research excellence. .....I miss S22 too.

I am Rachael Magwaza (23). I grew up in a small township named Tongaat (Hambanathi) on the north coast of kwaZulu Natal. I matriculated from Nkosibomvu Secondary School in 2010 and then joined Rhodes University in 2011 and did BSc in Chemistry, Mathematics and Mathematical Statistics. After getting my BSc in Chemistry and Pure & Applied Mathematics in 2013, I did my Honours in Chemistry the following year when I specialized in advanced NMR under the supervision of Dr Kempgens. I moved to University of Witwatersrand in 2015 to do my MSc under the supervision of Dr Kotze where I have been working on anticancer. I always had interest in drug discovery but working on my MSc made me realize that this is where I want to contribute my knowledge. While I was doing my MSc in 2016 I applied to do PhD at the University of Manchester after identifying Dr Freeman as a potential supervisor. I got accepted and I then applied for scholarships namely the NRF and Commonwealth scholarship. I received the NRF scholarship and I am awaiting the Commonwealth outcomes. Nevertheless, I will be funded by NRF and the grant from my supervisor.

I will be doing my PhD in Pharmacy and Pharmaceutical Sciences. I am excited to go there yet nervous but I believe it will be a phenomenal experience. I am grateful to my parents, friends, Dr Khanye and Dr Kotze.

My name is Tilele; I am a chemistry alumna from Rhodes University (RU) and my year group, the "g04s", consider ourselves to be particularly special because we were RU's centenary students. I did a BSc with majors in chemistry and botany and thereafter I did my Honours year in chemistry in 2008. Professor Davies-Coleman was my Honours project supervisor. It was tough year, both on a personal and on an academic level, but was worth it!

The RU Chemistry Department gave me a very good foundation in analytical chemistry, particularly through my Honours project. The day after my final chemistry exam I flew to the United Kingdom (UK) for an interview with a global pharmaceutical company. After successfully making it through the interview process, I took up a position working at Pfizer's European Research and Development Headquarters on inhaled drug products. After three years I joined the Quality Control Department at Imanova, another UK based pharmaceutical company, testing radiopharmaceuticals. The fundamentals of analytical chemistry, which I learnt at RU, played an important role in my successful progression as a chemist. Two years ago I achieved the professional accreditations of Chartered Chemist and Chartered Scientist awarded by the Royal Society of Chemistry (RSC).

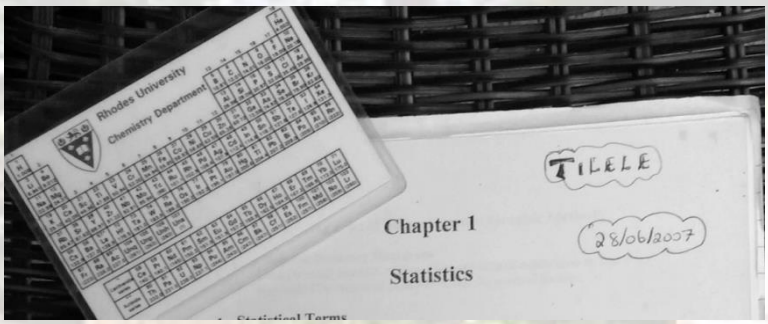
As part of my extra-curricular activities, I joined a committee of one of the interest groups at the RSC some years ago. Since then I have organised for speakers (experts in their respective fields) to give lectures to RSC members and the general public. I also volunteer in schools to promote chemistry. Every time I go to a school, I draw on my RU chemistry tutoring and Sasol Science Festival volunteering experiences to be confident enough to deliver good quality workshops and talk to students about careers in science. Generally my employers have been happy for me to represent them at events in schools.

In 2014 I went back to university and completed an MSc in environmental technology, specialising in water management, at Imperial College London. I now work for the UK Environment Agency. In my role, I bring together my knowledge of chemistry and the environment to prevent people and our activities from polluting and contaminating groundwater, a natural resource which in the UK is valued at US$ 10 billion. Our team works with different industries, engineers and water companies, to manage and protect groundwater. It was a hard decision to leave the world of pharmaceuticals

and make a career change to the environmental sector. I did it because I was seeking a role where I could align my interests with job fulfilment. Working for the Environment Agency, I can have a direct impact on protecting nature and making the environment a better place for us all. This has benefits for our health, social and economic well-being. I love the outdoors, which is why my current job role suits me perfectly. Although I don't spend as much time outside as I would like to, part of my job involves visiting sites to assess how different activities could impact groundwater. I am also learning about hydrogeology.

When I was at RU I played netball; I still play netball and I am an avid runner. At the weekends I do private tutoring for science students. I also tutor biology and mathematics which is interesting. I prepare for my tutorials exactly as we did as chemistry tutors at RU! I hope to use my tutoring earnings to travel the world someday.

My time at RU was amazing, both socially and academically! The Chemistry Department was my second home, especially in the final Honours year. Since leaving RU I have slowly discarded my notes, but I still frequently refer to my RU periodic table and Mrs Sewry's statistics course notes *(see attached photo)*.



Because of my good chemistry foundation from RU, I have had many exciting opportunities. Now I hope and look forward to using chemistry to help protect our water resources and make the world a better place.

Tilele Stevens was a second prize winner at the SACI regional seminars in her year for her Honours project presentation.

My name is Xolani Nocanda: I graduated my PhD in Chemistry is 2001. After graduating I joined Fine Chemicals Corporations as a Research and Development Chemist. My role was to develop methods for the synthesis of generic compounds from patents, to trouble shoot from the plant and characterise the final products.

In 2002 I joined the Chemical Cellulose producer Sappi Saiccor in Durban as a Scientist. Over 95% of the Chemical Cellulose produced at Saiccor is exported for end use application in viscose fibers, cigarette filters, film, filament, tablet making etc. My role was to conduct research aimed at addressing customer problems relating to the product, improving the plant process, and work on new products for commercialisation. While working at Saiccor I was seconded to the Council of Scientific and Industrial Research (CSIR) to carry out a research project aimed at investigating the use of Solid State Nuclear Magnetic Resonance Spectroscopy to better understand changes in the chemical cellulose process and to use the knowledge to optimise the plant process. The project was carried out in partnership with the Swedish Pulp and Paper Institute.

In 2008 I joined the Industrial Oleochemical Product (IOP), a subsidiary of AECI group as a Business Development Chemist. IOP produce fatty acids and vegetable oil derivatives for different end-use applications such as resins for paint manufacturing, surface coatings, flotation processes in mining etc. My role was to develop new products for commercialisation on lab scale and at pilot scale, and later work with the production team on plant scale. I carried out laboratory and plant trials on new products with customers and attended to customer technical related queries.

In 2013 I joined EThekwini Municipality Water and Sanitation division. EThekwini Water and Sanitation monitor sea water, drinking water, surface water, domestic and waste water for eThekwini Municipal region. My role is to supervise the SANAS accredited laboratory ensuring that the laboratory maintains its accreditation. I develop analytical methods to analyse water quality using Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) and Inductively Coupled Plasma Mass Spectrometry (for metals), Discrete Analyser and Gas Chromatography Mass Spectrometry. I also train Scientists and Analysts to perform the analytical tests. I co-supervise Honours and Masters Projects (or act as an Industrial mentor) for students at Durban University of Technology.

I am a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). As a registered scientist I mentor graduate trainees. Graduate trainees register as Candidate Natural Scientists with SACNASP and are placed in companies to gain industrial experience. My role is to oversee their development ensuring that they gain relevant industrial experience in chemistry to be employed and be registered as Professional Natural Scientists with SACNASP.

I still do private tuition in Mathematics and Physical Science to High School Learners. I also work with a Professional tutoring company called KipMcGrath where I tutor High School Learners in Mathematics and Physical Science.

To enhance my commercial and leadership skills, I completed a Program for Management Development at Gordon Institute of Business Science followed by Masters in Business Administration (MBA) at Stellenbosch Business School. Upon graduating from the MBA I became a Global Ambassador at the Association for MBA's (AMBA), where I submit business related blog articles. I am currently the Chairperson of Stellenbosch Business School Alumni Association for KwaZulu Natal region and a member of Stellenbosch Business School Alumni Exco.

I am actively involved in athletics. I have completed 6 Comrades marathons (getting 4 silver medals and 2 Bill Rowans), 3 silver medals in Two Ocean marathon and many standard marathons. I have represented KwaZulu Natal province at the South African cross-country championship.

Xolani completed his entire science education at Rhodes University (completing his masters' and PhD degrees under the supervision of Prof Kaye) and was one of the earliest helpers in the Khanye Maths and Science club.

My name is Dr Andrew Duggan: Rhodes was home for over a decade, a place to grow up and learn many life lessons, get a useful degree or two and make some life-long friends. It was an awesome experience and, certainly still holds lots of memories that I will never forget.

The change from being a post-doc researcher to becoming a job-seeker back in 2006, was a shock to the system, certainly one that Rhodes failed to adequately address for students at the time. I have no idea how that may have changed since. The greatest lesson that I learnt was that finding a good job has very little to do with academic achievement but a lot to do with interpersonal skills and networking. Every job that I have had since completing my degrees was in a very large part due to connections via friends or colleagues. The great big world simply doesn't owe new

graduates anything and you are just a number. Depressing as this may seem, it is powerful information. I learnt that I needed to be as outgoing as possible, take part in any and every activity I could. Then to make every effort possible to remember every person's name and a few fundamental things about them. Things that hold interest in their lives. Everyone wants to talk about their interests, so learn what interests them and let them talk about it. I'm sure those are all lessons from self-help books too. Books I should probably have read at some stage.

In any case, after leaving Rhodes and having no real direction, I gained experience in several jobs that included Martial Arts, Event Management and then the Pharmaceutical Industry. The last job being a dream position with Aspen Pharmacare. I was very sorry to leave Aspen but had no real choice as I was granted Permanent Residency in Australia and had a deadline in which to take it up. Finding a job in Australia was unbelievably difficult. The Aussies have no interest in foreign qualifications or experience. If you don't have Australian history then you are considered a bad risk so taking up a very low level position was my only option.

After one hundred and twelve job applications, four or five interviews and no positive sign of employment, I was, to put it mildly, desperate. One Saturday I was out at a hobby expo and met someone who shared my interest in World War II military vehicles. We chatted about our shared interest which at some stage diverted to a conversation about my desperate job-search to which he mentioned that he was a manager at an environmental company and might have a position for me. At that stage I had spent 5 months in Oz and had totally exhausted my savings. I was prepared to flip hamburgers at McDonald's so an offer to work at this environmental company was happily accepted. That turned out to be the worst job I have ever had. All I was required to do was operate a Gas Chromatography instrument for 8 hours a day but, with the high exchange rate of the Aussie dollar, paid more than my line manager at Aspen had been earning after 12 years on the job!

I worked exceptionally hard in the Enviro position and after 6 months moved to a Cosmetic company where I was a Product Development Manager for 9 months. Unknown to me this was actually a maternity position and I was let go when the lady decided to return. Now this might seem like bad luck but Australia has some exceptionally useful organisations that protect workers and consumers rights. If you legitimately feel that you have been wronged by poor service from you mobile phone provider or unfairly dismissed from your job, then you call them up, they offer free advice and if necessary mediate a solution.

In any case, I quickly moved into a new position with a scientific sales company. I was worried that I would be selling my soul to the devil and remember clearly at the interview saying to the Managing Director "I have no idea why I am here, I really don't want to become something like a used car salesman". The MD's sales skills were admittedly exceptional and he convinced me that I would gain great experience and have a life-long position with the company. The sales company turned out to be cut-throat, unethical and a daily fight to survive. I did, however, travel across the world from Hungary to Sweden and the US meeting some great people along the way. The sales and personal skills that I was able to develop were worth the diversion from my anticipated career.

5 years down the track, I happily left the company and subsequently joined Shimadzu Scientific. This company is exceptional, the team is dynamic and highly regarded for their scientific expertise and I have what I believe to be my life-job. Here I work with the Business Development Team to find synthetic and analysis solutions for scientists, promote and increase sales of Shimadzu products. This global company has over 10,000 employees with many scientists (including at least one Nobel Prize winner), engineers and highly competent personnel.

I guess the story that I am trying to tell is that leaving university is really difficult, moving to a new country and finding a job are exceptionally difficult but there is light at the end of the tunnel if you persevere and never give up. Utilising connections made at Rhodes, ones made in my personal endeavours and those made on the job are key to promotion either in a specific company or in an industry. Those connections should never be underestimated and the help should really be returned to the next generation. As they say "the wheel turns".

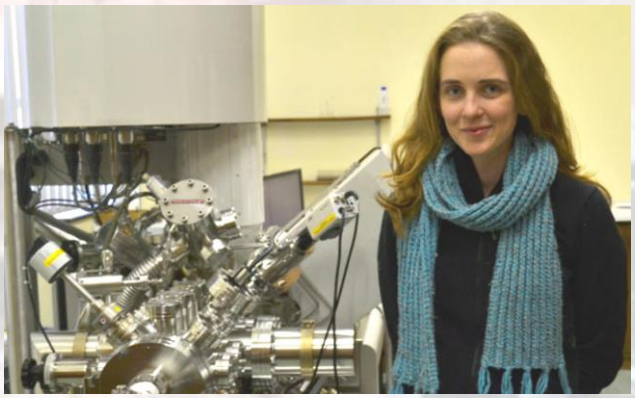
Rhodes University's MSc Student wins 2016 SA Women in Science Award

Taken from Rhodes newsletter 2016

The presence of RU's top scientists at the forefront of South African science and technology is no new phenomenon. Harris follows in the steps of a fellow Masters student, Miss Siphesihle Robin Nxele – who received the WISA accolade last year.

Rhodes has also been a home for Miss Xolisile Thusini (who did her Honours at Rhodes), another 2016 WISA winner who is now completing her Master's degree in the Department of Physics at UCT.

Having completed a BSc in 2013 (Chemistry and Physics) and a BScH in 2014 (Chemistry, with distinction) at RU, Harris visited China's Nanjing University in December 2015 for an exciting three-week research trip supervised by Prof Zhen Shen. She worked on the synthesis of fused-ring-expanded subphthalocyanines. In June 2016 she travelled to the United Kingdom for a month-long research visit to University College London (UCL) – with Prof Sandy Macrobert.



Harris's research topic focuses on developing dyes for photodynamic therapy (PDT), a non-invasive alternative cancer therapy. Mail & Guardian's special WISA advertorial details her project as: "the development of dyes for photodynamic therapy (PDT) treatment of cancer".

While radiation and chemotherapy result in the damage of both healthy and diseased cells, PDT is able to destroy cancerous cells more selectively. The Mail & Guardian goes on to explain the principle of PDT: “Dye is injected into the bloodstream, and is then activated by shining a laser light at the tumour site. The excited dye transfers energy to oxygen present in the tissue, producing highly reactive singlet oxygen, which results in cell death.”

Harris explains that PDT is more selective in that it requires the presence of 3 factors:

(i) A suitable photosensitiser (dye), which is activated by light,
(ii) A light source (in this case a laser) and
(iii) Oxygen present in the tissues.

In the absence of any one of these factors, no cell damage will occur. Hence, as laser light is only shone at the affected area, damage to healthy cells is significantly limited. All of this makes safer, localised cancer treatment possible. Harris has developed a couple of dyes already, and is now working on testing them in the RU labs. Her wrap-up towards the end of this year will include an intensive cell study to look at the toxicity and PDT effect of her dyes.

About her WISA nomination she comments: “I didn’t realise how big WISA is, but I was extremely happy to be nominated”. Having attended the gala event in Johannesburg with her proud mother as the perfect plus one, she was glad to see that Women in Science is a national and international concern that is garnering all-round support from government and corporate business. “It is unbelievable to see women doing it all; they have full lives and still dedicate sufficient time to carrying out fundamental research in science and technology”, says Harris.

She has been greatly inspired and wants to see the Department of Science and Technology (DST) grow and support more women leaders in the field. She believes that there is a “need for role models” who can act as living, working and pioneering examples to young scientists and researchers. “To actually be able to see ourselves at the next step of our research careers, we need to be looking at and learning from women who are already at that next step. Having strong role models shows us that it is a reality: that we can do it all – without neglecting all our other values and interests”, comments Harris. Harris’ take home message is this: science does not need to happen in a vacuum. When enough people come together, pulling the right resources and putting their best foot forward, truly amazing things happen. Her work is evidence of this. We wish Jessica every success in this pioneering research.