

# NEWSLETTER

Chemistry Department Newsletter

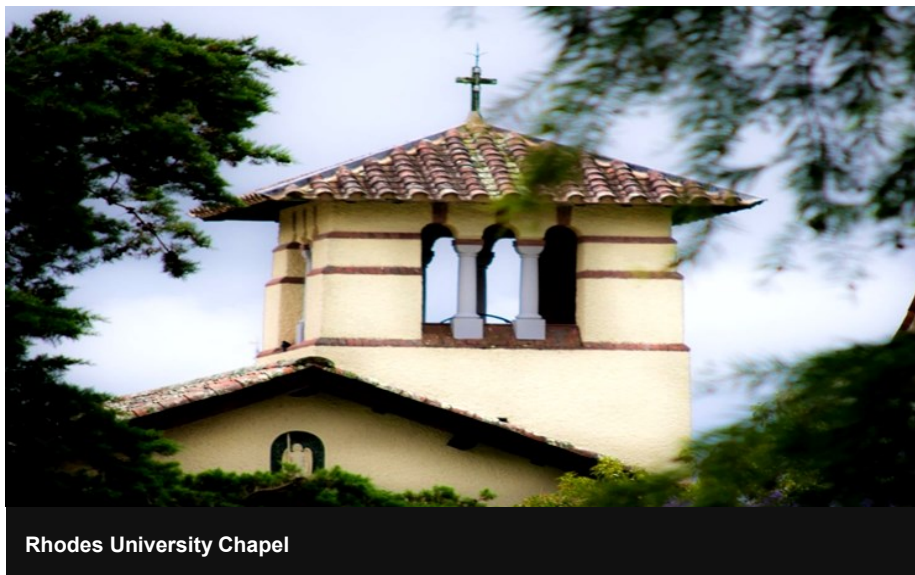
March 2016

## Message from the HoD

Welcome to all our graduates and their families! Whether you are leaving or just passing up to the next level of your studies we are excited to be able to mark this milestone with you. We are proud of our graduates, and consider every one to be members of our growing family.

The Department prides itself on the diversity of our students and staff members. Apart from attracting undergraduates, postgraduates and postdoctoral fellows from West, East and Southern Africa, the Department has drawn students from as far afield as the United States, Mexico, Chile, the UK, and New Zealand. On a regular basis we host visiting academics and students from various parts of the world, and have strong bi-lateral programs with France, Germany, Russia, Switzerland, Nigeria, Cameroon, and Japan. We also have other agreements such as the South-South collaborations with Chile, China and Argentina, and exchange programmes with Turkey, Hungary, and Bulgaria. These visitors' stories are represented in part on the pages of this newsletter, and we invite you to share your stories as well. We are always happy to hear what you get up to when you spread your wings beyond Grahamstown!

As always, our staff have made contributions to the development of knowledge and understanding in science through their involvement on the local, national and international stages. As you read on, I am sure you will join with us in congratulating them on flying the flag of Rhodes high.



Rhodes University Chapel

### FRANK WARREN CONFERENCE 2016

The Frank Warren Conference is the premier Organic Chemistry Conference in South Africa.

The conference will take place at Rhodes University this year from the 5th to 8th December 2016.



Contact Prof Rui Krause  
or  
Mrs Benita Tarr for more  
information.  
[chemistry@ru.ac.za](mailto:chemistry@ru.ac.za)

[www.rhodesfrankwarren2016.com](http://www.rhodesfrankwarren2016.com)

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**Sihle Nxele and her Father**

## **Siphesihle Nxele (MSc) awarded 2015 SOUTH AFRICAN WOMEN IN SCIENCE AWARD**

Known as one of the “Nyokong Babies”, Siphesihle Nxele was announced the winner of the 2015 SOUTH AFRICAN WOMEN IN SCIENCE AWARDS for MSc. This award is made to five women under 35 who are completing Masters or Doctoral studies. The awards recognize outstanding ability and potential.

A proud father, Mr Nxele (in picture above) flew up from Kwa-Zulu-Natal to be with his daughter on the special day.

The Chemistry and Rhodes community at large are proud of her. To see her story please visit <https://www.youtube.com/watch?v=xllu-P3GhpA&noredirect=1>

## **Colin Mkhize awarded prestigious Oxford Scholarship**

Nhlakanipho Mkhize, better known to his friends as “Colin” is a proud Lilian Ngoyi Alumnus who was awarded the prestigious Rhodes Scholarship to attend Oxford University in the UK from September 2015.

Colin started his career at Rhodes University in Joe Slovo House in 2009 and soon rose to the position of a Subwarden in his Second and Third years. Having concluded the maximum number of terms in office as a Subwarden, Colin successfully applied to become the Hall Senior Student in 2012.



**Colin Mkhize**

## Welcome Arthur!!

The Department was privileged to have had as visiting researcher Arthur Sarron, who as part of his MSc programme at Université Lille 2 was required to do an internship, and chose to do the internship with us in 2015.

After over 6 months of research he completed his mini thesis which he has also presented to the Department on the topic "Drug resistance in the HIV-1 subtype C protease enzyme. A high-throughput docking approach in the search for new ligands with activity".

We welcome Arthur back in the department in 2016 for PhD studies at Rhodes University.

Arthur's uncle  
Dr Pierre Kempgens is  
the NMR Specialist in  
the department.

~Dr Kevin Lobb



Distinguished Professor T Nyokong

## UNESCO Medal 'For the Development of Nanosciences and Nanotechnologies'

Congratulations to Professor Nyokong on being one of the recipients of the UNESCO 2015 Medal for the Development of Nanosciences and Nanotechnologies.

This is the first time that three of the Laureates are women and Professor Nyokong is also one of only two African scientists to receive the award (the other being Shem Wandiga from the University of Nairobi this year).

The medal was established at the initiative of the International Commission responsible for developing the Encyclopedia of Life Support Systems (EOLSS) theme on nanoscience and nanotechnologies in recognition of significant contributions to the development of nanosciences and nanotechnologies.

With contributions from thousands of scientists and experts in over 100 countries, this web-based encyclopedia is the result of an unprecedented global effort.

The Medal recognizes the tremendous benefits that stem from progress in the fields of nanoscience and nanotechnologies for our societies and economies.





## CONGRATULATIONS PROF NYOKONG

Rhodes University's Distinguished Professor, Professor Tebello Nyokong was awarded an African Union Kwame Nkrumah Scientific Award (AUKNSA) on 31 January 2016. Prof. Nyokong was awarded a Continental Award. The Awards Ceremony took place at the African Union Headquarters in Addis Abba, Ethiopia, where Prof. Nyokong received her award in person. President Jacob Zuma was one of the first to congratulate Nyokong for the award.

An awards scheme known as the "African Union Scientific Awards (AUSA) was established by the African Union Commission on 9 September 2008. This was later renamed the African Union Kwame Nkrumah Scientific Awards (AUKNSA) on 27 July 2010. The objectives of the awards are to award and honour outstanding African Scientists for their scientific achievements and discoveries, and promote scientific development in Africa through recognition and excellence among African scientists. They also aim to popularize and promote public understanding and participation in the implementation of Africa's Science and Technology Consolidated Plan of Action (CPA) and AU Assembly decisions on science and technology, and raise the profile of the science and technology sector in African Union Member States so that science contributes to Africa's sustainable development, poverty alleviation and integration efforts."

### SOUTH AFRICAN CHEMICAL INSTITUTE INORGANIC CHEMISTRY CONFERENCE 2015



Rhodes University hosted the 17th South African Chemical Institute (SACI) Inorganic conference (INORG2015) from 28th June — 2nd July 2015. The scope of Inorg2015 Conference covered all branches, including nanoscience & supramolecular chemistry, porphyrins & phthalocyanine chemistry, electrochemistry, organometallic, coordination and bioinorganic chemistry, catalysis, theoretical, environmental, green chemistry as well as material sciences.

A great number of distinguished international and national speakers delivered keynote, plenary and invited lectures under listed themes. Plenary speakers included, Rhodes University's Distinguished Prof T Nyokong, Prof H Furuta from Kyushu University in Japan, Prof N Kobayashi from Tohoku University in Japan, and Prof K Ozoemena from CSIR South Africa. Keynote speakers included Prof P Ajibade (Fort Hare University, South Africa), Prof. R Glaser (Ben-Gurion University of the Negev), and Prof Y Gorbunova (Russian Academy of Sciences, Russia), Prof A Martynov (Russian Academy of Sciences, Russia), Prof F Mohr (Bergische Universität Wuppertal, Germany), Prof G Smith (University of Cape Town, South Africa), and Prof R McCrindle from Tshwane University of Technology, South Africa.

Thank you to Professor Gary Watkins, Dr John Mack, Mrs Benita Tarr, the enthusiastic organizing committee which comprised of both academic and support staff members, and the entire Chemistry family for a job well done!

To learn more about the Inorg2015 conference

please visit the following website,

[www.inorg2015.co.za](http://www.inorg2015.co.za)

Conference delegates at Tea



## Congratulations to our staff!!

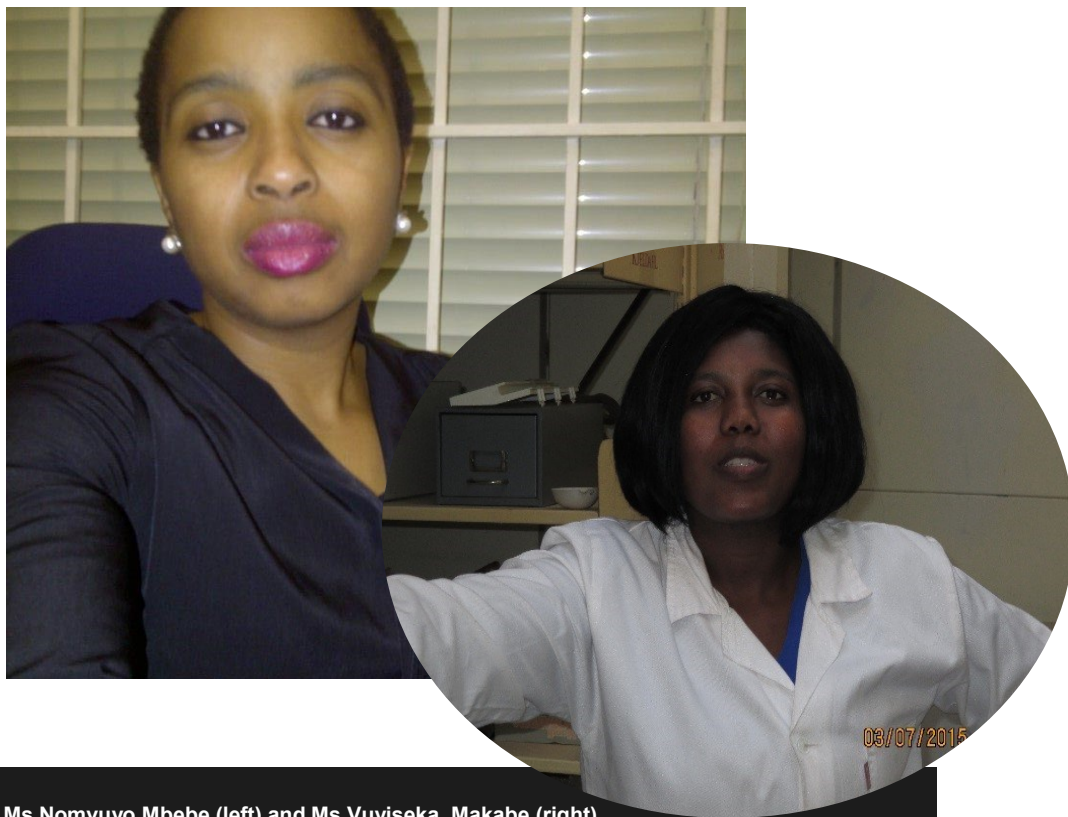
Our Technical Officers Mr Francis Chindeka and Ms Nomvuyo Mbebe - enrolled for Masters Degrees.



### Welcome 2016 post doctoral fellows

#### Dr Gertrude Fomo

Dr Fomo is a new Post-doctoral research fellow at the Rhodes/ DST Centre for Nanotechnology Innovation, Chemistry Department since March 2016. Her research involves modeling chemistry based on Time-dependent Density Functional Theory (TDDFT) for the calculation of the excited energy of HOMO and LUMO orbitals for the synthesized metallophthalocyanine compounds in the addition of supervising masters and doctoral students in the field of electrochemistry. Dr. Fomo graduated her PhD in Electrochemistry at the University of the Western Cape (UWC) in 2015. During her doctorate study, Dr. Fomo was a Lab Assistant in the organic and inorganic laboratories at the University of Western Cape. Dr. Fomo obtained her MSc in Inorganic chemistry and BSc in general chemistry in 2011 and 2009 respectively at the University of Dschang-Cameroon.



Ms Nomvuyo Mbebe (left) and Ms Vuyiseka Makabe (right)

**T**he Department welcomed Ms Nomvuyo Mbebe (Stores and Buying) and Ms Vuyiseka Makabe (Technical Officer).

Ms Mbebe joined the department in April this year. Her responsibilities include monitoring stock levels, timeous placing of orders with the suppliers and maintaining an updated inventory system.

Prior joining Rhodes University, Ms Mbebe worked as a Laboratory Supervisor for a water and mineral testing laboratory in Boksburg, Johannesburg.

Ms Vuyiseka Makabe was born in Grahamstown. She matriculated in one of the local schools, Nombulelo High School. She completed BSc and Honours degrees in Chemistry, and a PGCE at Rhodes University. Ms Makabe worked at the University a few years back as a temporary technical officer and then moved to St. Andrews College as a Laboratory Manager before taking this post. "It is great to be back in the department. I hope I will learn a lot from the ever nice and welcoming colleagues and also hope to contribute to the success of the department. I am a hard worker, determined and take pride at what I do", says Vuyiseka.

The latest family member is Mr Monde Mafani, who joined Chemistry as a Technical Officer. A warm welcome to Mr Mafani.

#### Dr Bokolombe Pitchou Ngoy

**Dr B.P. Ngoy** is a Photochemist and Photophysicist, specialist in Laser flash Photolysis and Pump-Probe Spectroscopy. He is currently a new postdoctoral fellow at Rhodes University under the supervision of the distinguished Professor **Tebello Nyokong**. He is now working mainly in the synthesis of modified BODIPY dyes structures and their photophysical properties studies for the photodynamic therapy treatment purpose. **Dr. B.P. Ngoy** graduated his PhD at Masaryk University in Brno, Czech Republic in physical organic photochemistry under the supervision of **Prof. Petr Klan** and was a postdoctoral fellow from 2012-2013 at Kansas University under the supervision of **Prof. Rich Givens**. **Dr. Ngoy** is a senior lecturer at University of Kinshasa in Democratic Republic of the Congo.



## POSTGRAD NEWS

The Rhodes University Chemistry Department is the home of many intelligent, talented and committed people. All of whom work together as a group of researchers for the department but also as individuals determined to succeed in their field of study. The post-grads are involved in the department, they are enthusiastic about their work and take opportunities when they are presented.

Post-Grads are encouraged to participate in aiding the department with its development of undergraduate students by tutoring the first years. These activities occur weekly. Post-grads view tutoring as a privilege and see it as shaping young minds so they might one day reach the post-graduate level. Demonstrating also forms part of the tutoring programme. This involves helping undergrads learn good techniques in the laboratory, such as how to properly handle organic chemicals and glassware in complicated apparatus setups.

Many post-grads are given the chance to go abroad to work in laboratories that their supervisors collaborate with. In 2015 Martijn Wildervanck, Justin Stone and Gugu Kubheka travelled to Japan to work with Prof. Kobayashi, who collaborates with Dist. Prof. T. Nyokong and Dr. Mack.

Both Postgraduate and Undergraduate students are encouraged to plough back into the community. Some of them choose the option of teaching primary school students chemistry as part of their Honours course under the supervision of Mrs Joyce Sewry practicing service-learning. Every Saturday each laboratory takes turns teaching maths and science at The Khanya Maths and Science Club.

Post-grad students also represent the University in competitions such as the recent Intervarsity that was held at Rhodes this year. Many sporting codes are played, from athletics and football to hockey and rowing.

The department and postgraduate team looks forward to working with this enthusiastic group of Postgrads!

And even a novice can have a lot of fun!  
Thanks for the enthusiasm Vuvu



## TEAM BUILDING 2016

The ability to work within a team is considered by many to be one of the keys to success in the modern business and academic environments, and is certainly one of the aspects which we value in the chemistry department. Each year we spend a day together having fun as the entire department, including support staff, academic staff and post-graduates. Although we have in the past had a busy programme of teambuilding activities, this year we decided to have a less formal programme, most of which was organized by Mrs Benita Tarr and Dr Rosa Klein. We piled into cars and went off to Albany Bowling Club to learn to play bowls. Our instructors were Vuyisile Dondashe and Sandile Sukula (both members of the Department of Chemistry), and thanks to their detailed and careful instruction we were able to enjoy a hot summer day on the greens! Of course, behind the scenes there was a different kind of team building a fire and roasting meat on a spit for the late lunch which followed; thanks are due to Andre Adriaan, Francis Chindeka and Rubin Douglas for the mouth watering feast which followed.



The teams still learning how to  
take a stance and roll the woods.



## Dr Klein's Green Sabbatical



In 2015 I had the wonderful opportunity of a dedicated semester to develop myself as a researcher – that time the University calls a sabbatical! I spent 3 months at the University of York in the city of York in England. At the University of York I was associated with the CHEM21 project (focussing on medicinal chemistry in the 21<sup>st</sup> century). This is a group of Universities and SMEs who are looking at improving the environmental footprint of the pharmaceutical industry. I developed two short lessons for their online masters level course on Life Cycle analysis and Green retrosynthesis (using renewable resources in the synthesis of active pharmaceutical ingredients), and spent happy hours learning and talking about improving our environmental impact.



The Nave in the York Minster  
– built on the ruins of Viking  
and Roman fortresses.

Of course, it is a pity to travel to such a beautiful and ancient city without taking some time to meet the locals and visit the various sites of interest. I was able to visit York Minster (a cathedral built on the ruins of a Roman camp, built on the ruins of a Viking settlement) and hear a personal talk on how stained glass making has developed through the centuries. Of course that also gave me the opportunity to try out the local Italian ice cream round the corner and wander through beautiful gardens (in the rain).

While I was away I took the opportunity to visit a friend in Sheffield and presented my work there before heading off to Évora in Portugal for the first ISYSYCAT (international Symposium on Synthesis and Catalysis). The city of Évora is a walled city where the buildings within the wall have hardly changed in over 1000 years. The meeting was attended by delegates from all over the world and covered topics from inorganic chemistry to biocatalysis. I met many potential collaborators and look forward to implementing some of the ideas which we shared. It was a privilege to chair one of the sessions of the conference and get to know some of the keynote speakers up close.

On my way back to Grahamstown I stopped in Pretoria to present my research in the department of chemistry at UP, and have set up a collaboration with two academics there to study the physical chemistry of an important class of organometallic compounds. You never know what the next opportunity will be and how it will come around the corner!



The residence I stayed in  
at the University of York.



Professor Kerry McPhail in a laboratory

## 2015 BARKER LECTURE

Professor Kerry McPhail from the Department of Pharmaceutical Sciences, Oregon State University talked about “Natural Products Research for Human Health: Integrating Microbial Ecology and Evolutionary Biology in Pharmaceutical Drug Discovery and Development.”

At a time when pharmaceutical pipelines of efficacious new chemical entities remain critically low, it is essential that available sources of biologically active natural products be mined to the full extent of available technologies to assess their potential as pharmaceutical leads or molecular research tools to understand disease mechanisms. Natural products are small organic molecules that are considered non-essential for cell growth and reproduction, and thus part of the secondary metabolism of living organisms. Historically, they have contributed over 50% of approved pharmaceutical drugs, particularly for infectious diseases and cancer.

A prominent challenge in modern natural products research is the prioritization of new structures with unique biological mechanisms to avoid re-isolation of known or nuisance compounds. The discovery of two series of natural products with intriguing and different biological mechanisms has shaped our recent pharmacological and chemical strategies for the discovery of additional new natural products, in which we seek to take advantage of rapidly evolving technologies. In addition, we have embarked on a collaboration with evolutionary biologists to explore the patterns and processes that operate in the genomic diversification of secondary metabolism, which may lead to a predictive tool for medicinal natural products discovery.



### A Pollutant's Tale

The Chemistry Department was once again invited to present “A Pollutant's Tale” to the grade 1-3 learners at St Andrew's Prep. It was a very good culmination of their science week and many of the learners were dressed as scientists, in “lab coats” (some were lab coats, and others were clearly Dad's old white shirt), with “safety glasses”. One boy also sported a “moustache” and some had gelled their hair to show they had been “in an explosion”. It is interesting to see what the image the learners have of a scientist. The Rhodes students were most impressed with the scientific knowledge that these learners had – obviously a job well done by their teachers. “I just love the enthusiasm of these little people, to learn more” said Mrs Joyce Sewry.



# Events to look forward to!

2016 BARKER  
LECTURE

2016 Post  
Doctoral  
Presentations

SACI Regional  
Seminars

Honours Project  
Group Seminars

Honours Oral  
Presentations

FRANK WARREN  
CONFERENCE  
5-8 December



Thank you to our  
graduation sponsors  
1st and 2nd year -  
Book prizes  
Sigma Aldrich -  
3rd and Honours prize  
SACI

## Mathematics Experience 2016

On Friday 19 February 2016, the Rhodes University Mathematics Experience took place in the Barratt Lecture Complex. Two hundred and fifty of the biggest and brightest maths stars from schools in the Grahamstown District gathered to participate in the annual mini maths Olympiad – with various cash prizes and three full bursaries to study at Rhodes University up for grabs.



From Grahamstown East and West, to Kenton and Port Alfred – ours is a local intellectual landscape with immense promise and potential. In an initiative highly supported by the VC, the most talented scholars from Grades 7 to 12 are invited to this event to be challenged and entertained in a competition designed to: (i) stimulate interest in mathematics, (ii) encourage learner participation in problem-solving activities, and (iii) assist schools in identifying hidden talent. The open invitation means that the focus is not just on Grahamstown central, but the broader community as well.

The programme included the all-important Olympiad and a special presentation by guest speaker Ms Tal Moore – a Sharp Calculator support specialist from Seartec. Recognition was given to the top achievers in each grade from all participating schools.

In the run-up to the big event teachers were encouraged to select four of their learners from each grade (20 learners per high school and four per primary school). Thereafter orientation sessions were held on 5<sup>th</sup> and 12<sup>th</sup> February – at the RU Education Department's New Lecture Theatre – with special provisions being made for integration, familiarity and practice for first time entrants.

On the actual day all the learners came ready to represent their schools. They were challenged but conquered with ease. With some of their teachers (and a few parents) also in attendance, the one hour Olympiad went absolutely smoothly.

Twenty of the participants shone brightest, with winners from eleven of the competing schools: St. Andrew's, Diocesan School for Girls, Kingswood, Victoria Girls High, Graeme College, Mary Waters, Nombulelo Secondary, Nathaniel Nyaluza, Kuyasa Combined School, Nompucuko Secondary and Ntsika Secondary.

By Anima McBrown



Students and Staff celebrating Prof Krause's birthday

# THANK-YOU

to Mrs Tarr and Dr Klein for setting, finding stories and publishing this newsletter.

## **Our success stories: Sarah D'Souza**



Coming from a small town in Zimbabwe, Rhodes University was the ideal place to continue my studies, providing a home away from home atmosphere. My choice to major in chemistry as an undergraduate was purely coincidental as I was avoiding mathematics. This path however, has been the most exciting and daunting part of my life for the past few years. As a postgraduate, the Chemistry Department offered a supportive environment where students weren't just a number and tea time was an opportunity to develop friendships, share ideas and problem solve with fellow students and lecturers alike. Studying under the supervision of Distinguished Professor Nyokong, I was privileged to obtain support and funding which enabled me to continue my studies to a PhD level, making me the first and only "Doctor" in my family. In addition, access to world class equipment made for high quality research, and hands on experience with the instruments, which would be unheard of at most larger institutions. As part of my PhD course, I was afforded the opportunity to travel to Japan to study under the guidance of Professor Kobayashi. Over the course of three months, I learned invaluable skills and techniques in my field of research, made lasting friendships and had the chance to travel the country. I would also like to mention the dynamic outreach programs which the department has been involved with over the years. This provided me with the platform to give back to the community, which I am passionate about and hope to continue. This year I have been fortunate to have been awarded the NRF Innovation Postdoctoral Fellowship, enabling me to continue my research with nanomaterials at UWC. I am very grateful to the staff and students in the Chemistry Department for the amazing time I have spent there – Thank You!

### **Congratulations to our Best 2015 Students**

<b>Best 1st year student</b>	<b>Elisa Kirigin</b>
<b>Best 2nd year student</b>	<b>Ms Kelly Schwarz</b>
<b>Best 3rd year student</b>	<b>Ms Lindokuhle Nene</b>
<b>Best Honours student</b>	<b>Mr Nnamdi Nwahara</b>
<b>Douglas Rivett Prize</b>	<b>Ms Kauri Botha</b>

### **Congratulations to our graduates:**

2015 3rd year class - Congratulations

2015 Honours class - Congratulations

Mr W Feldman - MSc	Ms C Bromley - PhD
Mr P Kabwe - MSc with distinction	Ms S D'Souza - PhD
Ms S Nxele - MSc with Distinction	Mr Y Hassan - PhD
Mr M Wildervanck - MSc	Ms BA Moronkola - PhD
	Ms N Ngomane - PhD

## CONGRATULATIONS CHARLIE!

After a great deal of thought, four of our students decided to participate in the 2016 Famelab South Africa heats, held at Fort Hare. Famelab is an international Science Communication competition, run by the British Council in the UK and SAASTA and Jive Media in South Africa.

The Eastern Cape heats took place over two days, with the first day being some intensive training on how to communicate your science topic in three minutes. Charlie O'Donoghue said, he learnt that, "You must not use more than three concepts, each of which must be defined right at the beginning" and then you may not use any other science jargon.

The second day was time for the heats. Aviwe May, Zweli Hlatwayo and Charlie O'Donoghue were of the students selected to go through to the second round, and quickly had to prepare a second talk. Some really valuable feedback was given to all participants, and during the lunch break, they were allowed to have individual chats with the judges who gave them more sound advice.

Three students were selected to go through to the semi-finals in Johannesburg, and one of these is Charlie O'Donoghue, an MSc student in Prof Nyokong's lab.

The semi-finals were preceded by two days of master class training with Malcolm Love, a well-known and experienced BBC journalist. The training included teaching about stage presence, how to address a live audience. How to tell a story of science as opposed to fact statements and numbers. The training also included valuable training for how to present with respect to one's body language and interesting things like 'stage choreography'. From those two days a lot of new ideas were born in many of the contestant's heads and the semi-finals were really well done by all.

Charlie O'Donoghue was selected to go through to the finals, which will be held in Cape Town on the 4<sup>th</sup> of May at the Going Global Conference.

### Khanya maths and Science Club prize-giving

The year is almost at an end, and learners are writing exams, which will determine what the future holds for 2016. The Khanya Maths and Science Club recently held its annual prize-giving, to reward learners who have regularly attended the Club meetings on Saturday mornings. Learners who attended most Saturdays received book prizes; merit awards were books of Sudoku puzzles, and certificates were also handed out.

Ms Muthumuni Managa, a PhD student in the Department of Chemistry was the guest speaker at the occasion. Ms Managa grew up in rural village in Limpopo, and last year she was awarded an MSc, with distinction. "So you see, it's not where you come from but rather it's what you dream, together with hard work, that determines who you become" was her message to the Khanya learners.

Mrs Joyce sewry, coordinator of the Club thanked the staff and students of the Chemistry Department for volunteering their time on Saturdays, Prof Nyokong for funding, as well as the Albany Museum, Ms Gail Cobus for their support over the years.

The Khanya Maths and Science Club will resume on 27 February 2016, "and we look forward to a new intake of learners as well as welcoming back those who have been here before" said Mrs Sewry.



The Khanya Maths and Science Club prize winners, with Ms Esther Arinola who has been doing research towards her Med. November 2015

## Contact Us

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