

Graduation Newsletter

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Message from Prof Krause



CONGRATULATIONS!

The 2013/14 academic year was a momentous year for the Chemistry Department and to all our graduates, I can tell you that you are likely to look back at this point as a milestone in your own life. For many of you this graduation represents the culmination of many years of lectures, tutorials, assignments and the dreaded "e...".

I hope however, that you will also look at the time you spent at Rhodes as some of the best years of your life; building friendships, achieving sporting and cultural highs, and yes, completing your degree. These are all things to celebrate.

Many of you I hope will decide to continue at Rhodes in a post-graduate degree, and may in time join our researchers in trying to solve some of the problems facing South Africa and indeed the world. In this respect I have to congratulate everyone, especially those post-

graduates who are completing their study at Rhodes and who helped us collectively produce over 100 publications for the first time in our 110 year history. I would like to extend a vote of thanks to the parents, sponsors and friends of all our graduates. Your support and encouragement has enabled these graduates to stand tall, so take a collective bow and bask in their achievements.

Of course I cannot even begin to express my appreciation to all the Chemistry staff, the researchers, the technical staff and the support staff, whose many hours of lecturing, preparation, reading over endless drafts of theses, constant applications for funds and reporting on the projects, dealing with queries, fixing instruments and many more have provided an environment that is the envy of many.

This environment, the Chemistry Department, boasts some of the "best" of everything in the world. New equipment such as NMR and TOF-SIMS is the **best** in South Africa, researchers like Distinguished Professor Nyokong (A-rated chemist) continue to inspire South Africans to do the best research, and our students are clearly the best since they constantly win

awards and prizes, and their impact on the community will be warmly appreciated long after you leave Grahamstown.

Of course 2013 was not without its changes, so we said farewell to a few people, including Professor Torto, Dr Antunes, Mr Fourie, and Mr Mcuba, and hello to Mrs Peters, Dr Mashazi, and Dr Britton. Welcome to the new staff, I hope you will find a warm home at Rhodes for many years. Welcome back to all the graduates who continue in a new role as postgraduates, researchers and mentors. To those who are leaving us I say "auf wiedersehen" (until we see you again), because we will always have a place in our hearts for you. Come back soon for a cup of tea, or do please let us know where you are and what you achieve – I have no doubt it will be fantastic.

Regards

Professor Rui Krause

SPECIAL POINTS OF INTEREST:

- **Message From The Head Of Department**
- **Welcome New Staff!**
- **Community Outreach**
- **New Cryogen Plant**
- **ChemSoc**
- **British Council**
- **DST Nanotechnology Innovation Centre**
- **2013 in Review**
- **Alumni**
- **Visiting Fellows**
- **2014: The year of Crystallography**
- **Dr Mashazi goes abroad**
- **Is there life after retirement?**
- **Chemistry Calendar 2014**

Welcome Interns 2014!

Ms Wendy Fodo (Technical)



Mr Jethro Christian (Clerical)



Welcome to the Staff of the Chemistry Department

Mr Jonathan Britton (soon Dr)

PhD obtained 2013 - Rhodes University
 MSc (with Distinction) 2010 - Rhodes University
 BSc (Hons)(with Distinction) 2008- Rhodes University
 BSc 2007 - Rhodes University
 New Manager of DST/Mintek Nanotechnology Innovation Centre – Sensors (NIC)
 I was privileged to spend 4 months in Sendai, Japan in 2008 with Prof Kobayashi at the Tohoku University where I learned techniques on phthalocyanine synthesis.



Dr Philani Mashazi

Dr Mashazi, is a newly appointed staff in the Department of Chemistry as an Inorganic Chemistry lecture. His research involves the integration of biomolecules with nanomaterials for the design of electrochemical biosensors. Dr Mashazi has been involved in this research field during his PhD degree which he studied part-time at Rhodes University and employed by Mintek in Randburg from 2007 – September 2013. During his tenure at Mintek, Dr Mashazi was involved in various research projects aimed at designing and developing electrochemical immuno(bio)sensors for the detection of communicable diseases. Dr Mashazi received all his degrees at Rhodes University in BSc (2003), BSc Chemistry Hons (2004), MSc Chemistry (2007) and PhD Chemistry (2011).

Mrs Bryone Peters (Technical Staff)

My responsibility is to set up the equipment, chemicals and any items that the first year students may need to complete their practical's successfully. It means planning and strategic thinking on a weekly basis. For instance, for the titrations for one particular practical, I have to prepare 60 litres of an acid and a base to accommodate the 385 students for the week, clean up, pack away and re-organize the equipment in such a way, that I can keep track of the quantity that is used, broken, needing repairs and just extras in the event of a higher than calculated demand for the day.



COMMUNITY OUTREACH!

Service Learning: Second year Organic Practical's



The second year service learning practical which was developed by Ms Sarah Abel, as her master's degree in Chemistry Service-learning in 2010 is used to teach the students how to make azo-dyes as well as to communicate their science to others. In the first of two practicals, the students use combinatorial chemistry to make different coloured azo-dyes. In the second practical, grade 10 and 11 learners, usually from under-resourced local schools, join the second years in the laboratory, where the second years act as teachers, teaching the learners and reflecting on the experience. The learners each get to dye a t-shirt for themselves, using the dye they have made.

Both sets of students gain immensely from this exercise. All the demonstrators agree that the second years engage with this practical far more than any other – since they are responsible for someone else's learning. And the learners get the experience of being in a real laboratory – wearing lab coats and safety glasses, while learning how to use balances measuring cylinders, etc.

Comments from learners include:

"What I liked the most was the two students J and K because they helped me a lot. I also experienced a lot through them. I also liked what we were doing, I think I will do chemistry when I am in university. It was a great pressure [sic] to come here I experienced a lot thing. I am looking forward to come here again."

"What I mostly enjoyed about this afternoon was that of working in a laboratory with other people who are very interested in chemistry as I am. We don't get to work with chemicals all the time or practical work, so this was an experience that was very exciting"



Khanya Maths and Science Club

The Khanya Maths and Science Club is in its 15th year! The aim of the Club is to engender a love of Maths and Science amongst its members, who range in age from grade 7 - 12. This year the community of Grahamstown has again shown how much they value the work this Club does, since the number of members is the highest ever at close to 140. "Such a large group of learners requires lots of organisation and teaching space, and we are grateful to the Albany Museum for the space" said Mrs Joyce Sewry. Undergraduate and post-

graduate students and staff of the Chemistry Department do most of the teaching, but this year teaching staff from the Department of Statistics are doing a great job with the grade 9 group.

In addition to the weekly classes at the Albany Museum, in 2013 the Club went on two outings – to Fairewood where they did an obstacle course (for this we thank Mr Josh Paton and his staff who hosted us) and to the Addo Elephant Park (thanks to the student organisation

WildReach). We were fortunate to see two lion, but not a single elephant! The year ended with the prize-giving at which the guest speaker was Kwanele Mgolozeli, a student who had done Chem Honours the year before.



Such a large group of learners requires lots of organisation and teaching space, and we are grateful to the Albany Museum for the space"

New Equipment

The completed plant should be able to deliver around 100 L of liquid nitrogen per day.

Unlike most liquids however, this liquid nitrogen is an amazing -196°C, cold enough to make instant ice-cream

Chemistry gets new Cryogen Plant

The Chemistry Department has been supplying liquid nitrogen for instrument and cryogenic use to the Rhodes and Grahamstown communities for many years. Recently the acquisition of new NMR spectrometers and other instruments necessitated the upgrade to our facility. The new Stirling generator will be delivered in April, and was recently spotted in Rotterdam harbour.



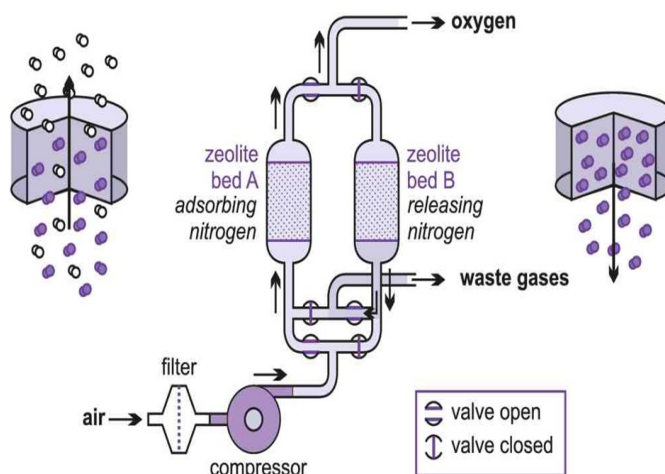
How Does It Work?

Despite the fact that we need oxygen to live, the air we breathe is mostly (~78%) composed of NITROGEN (N₂) and only about 21% oxygen plus a few other minor gasses. As with most gasses, if you cool it, nitrogen will liquefy, so the plant works by first separating the oxygen and nitrogen through a PRESSURE SWING

ADSORPTION system and then cooling and compressing the purified nitrogen to transform it into a liquid. Unlike water vapour that condenses around 80°C, this liquid nitrogen is an amazing -196°C (the lowest temperature ever recorded on earth is only about -90°C, so this is a lot colder).

As a liquid the cooled nitrogen has many of the same properties as other liquids, so we can pour it and transport it, and it boils if you heat it up above the boiling point (at normal atmospheric pressure this is -196°C).

Liquid nitrogen has many uses, so come and find out what can be done with this amazing fluid.



picture c/o Wikipedia

NEW NMR

Under Prof. Krause, there have been some exciting developments with regard to the NMR facilities. An additional R10 million worth of new NMR equipment has been bought, transforming Rhodes into one of the best NMR facilities in the country. Later this year a Bruker Prodigy Probe will be installed on the current 600MHz instrument making this the most sensitive triple resonance instrument in all of Africa. Together with this, the 400MHz is due for an upgrade that will bring solid state NMR firmly to the Eastern Cape under the direction of Dr. Kempgens - our NMR specialist. In anticipation of the 400MHz instrument being used for solids rather than for routine work, a Fourier 300MHz instrument (the first of its kind in the country) has just been installed on the ground floor of the department. This spectrometer comes with a 16 position sample changer and is ideally suited to routine work by all postgraduates (including honours students!). All that is left for the 300MHz to see extensive use is for staff and students to be trained, and this will take place over the next few weeks.

CHEMSOC

The Chemistry Society has been around for more than 23 years with the aim of procuring passionate chemists from young minds that make Rhodes the university it is. Like with most societies at a university, socialising is an important aspect of ChemSoc. The ethos and history behind ChemSoc make it a society worth signing up for. All this, together with exposure to the science itself in novel and exciting ways, such as experiment workshops and demonstrations, a foundation is formed upon which this exceptional society is built. However, unlike most societies, the Chemistry Society orients its attention towards growing and inspiring a fascination for chemistry itself and the love of science in general. Through a series of events, members of the society are given the opportunity to attend fantastic lectures given by visiting, often international, lecturers on interesting and new fields of chemistry. Coupled with these lectures, the society enhances the capacity of those who are bent on taking chemistry further in their lives by generating a friendly social environment for budding chemistry students to chat and get to know the more established members. The society considers this element to be of paramount importance as the link between wisdom and youth is founded in conversation. Such conversations fuel the determination and curiosity to continue with the study of chemistry. After all, science is taken further not by those who singly take leaps but by the entire group, who together form a united front, pushing the frontiers of science.

Written by: Charles O'Donoghue

British Council Travel Grant Link



Dr Samson Khene

Dr Samson Khene was recently awarded the British Council Travel Grant Link in order to foster research collaboration with Warwick University in the UK.

The programme provides opportunities for early career researchers from the UK and internationally to interact, learn from each other and explore opportunities for building long-lasting research collaborations. The research link provides financial support for early career researchers in the UK to spend up to three months in any partner country participating in the Researcher Link initiative, or for partner country researchers to come to the UK. The aim is to enhance and strengthen links for future collaboration, build research capacity in developing economies, and enhance the researchers' career opportunities.

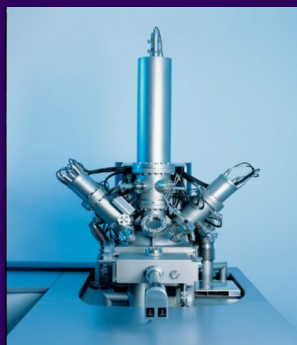
DST Nanotechnology Innovation Centre - Sensors (NIC) NEWS:

Director of the DST Nanotechnology Innovation Centre – Sensors (NIC), Prof Tebello Nyokong would like to welcome Mr Jonathan Britton as a new staff member. Mr Britton joined the NIC in January 2014 as NIC Manager. He completed his Doctoral degree at Rhodes University in 2013 under Prof Nyokong's supervision and was appointed as a post-doctoral fellow for a couple of months.

Prof Nyokong, an A-rated scientist and National Research Foundation (NRF) Lifetime Achievement Award holder has also been awarded an equipment grant to the value of R10,000,000-00 from the NRF this year.

The funds will be used to purchase a "Time-of-Flight Secondary Ion Mass Spectrometer (TOF-SIMS)". TOF-SIMS is a very sensitive surface analytical technique. It provides detailed elemental and molecular information about surfaces, thin layers, interfaces and full three-dimensional analysis of the samples. The technique characterising is used in semiconductors polymers, paint, coatings, glass, paper, metals, ceramics, biomaterials and pharmaceuticals. In addition industries such as Aerospace, automotive, Biomedical/ biotechnology, Defence, Pharmaceutical and Telecommunications will benefit from TOF SIMS.

Rhodes University was also very fortunately to receive funding from the United Kingdom this year aimed specifically at Honours students wanting to follow a career in cancer research. The Bircham Dyson Bell "Pearson-Young Memorial Trust" sponsored 5 Honours and 2 Masters students this year. Part of the scholarship agreement is that the selected students visit an institute in the United Kingdom for about 1 month to obtain international exposure to research into cancer.



TOF SIMS from ION TOF

Letter from Colin Mkhize: Postgrad Representative

2013 in review: A student perspective

From the postgraduate student perspective, 2013 was a good year. We welcomed the biggest honours class which we have had ever (19 students) and this proved to be a very good thing. The energy and enthusiasm which they brought to the department was contagious. It was great to get to know them, and the new Masters and PhD students at the departmental Braai held at the Gavin Relly Postgraduate village.

It was a sad moment to part ways with Dr (now Prof) Tshentu and his research students. The bonds which had formed were indeed hard to cleave, but we do wish him well at his new post in Port Elizabeth. We also bade a sad farewell to Dr Edith Antunes, who was a pillar of wisdom for many students in the department. Losing Prof Torto to a new venture in Botswana was also a major blow to us but we wish him well and hope that he always feels that he has a home here in Grahamstown.

It was with great joy that we welcomed Prof Krause as our new Head of Department. The students had a meeting with him early in the year where he introduced himself to us and made us all feel at ease. In that meeting, two postgraduate representatives were elected to sit in on the Science Faculty student representative meetings and air issues which needed to be addressed. One of the biggest issues in 2013 was the introduction of a new Intellectual Property policy for the university, but this is still being discussed.

The annual SACI regional seminar was held in Alice at University of Fort Hare. Here, two of our students presented; Ms Tracy Saywood (in the Honours category) and Ms Nokuthula Nogemane (in the Masters/PhD category). These ladies did our department proud and came 1st in their respective categories.

2013 was a very fun and social year indeed. ChemSoc hosted a Indoor soccer tournament, a movie evening and the End of year dinner. These events were well organized and were thoroughly enjoyed by all who attended. It was great to see even some lecturers enjoying the sport!

The year ended with many students and staff attending the 41st National Convention of the South African Chemical Institute in East London hosted by Walter Sisulu University. Although challenges arose during the conference, fun was had by all and many new connections were formed with other students from across the country. We congratulate Ms Charmaine Tshangana who was awarded 1st place for her oral presentation at the conference Gala dinner. You did us proud.

The success of a student is always a group effort. As students we would like to thank our supervisors for all the work they put into us and for their encouragement when days are dark.

For all those who have completed their studies, we wish you well and hope that all your future prospects are blessed.

Colin Mkhize



ALUMNI

Nduduzo Malinga [MSc]

I am currently doing PhD at UKZN. I am working on a graphene based nanocomposite for use in fuel cells, sensors and electronic switches. I am doing my PhD in the Electronic Engineering department.

Dr Michael Datt [PhD]

Principal Scientist at Sasol Technology

C1/Syngas to Chemicals Group Leader. I live in Johannesburg. Not married at the moment. My job involves the development of new heterogeneous catalyst systems and/or processes for the conversion C1/syngas to high value chemicals as well as the functionalization of Fischer-Tropsch feeds to downstream value added products. Currently busy with my MBA (University of Stellenbosch).

Dr Megan Coates [PhD]

I'm working as a scientist at the Stellenbosch Nanofiber Company in Cape Town. We do innovative research on the development and manufacture of nanofiber-based materials for advanced wound care and regenerative medicine, among other applications.



Sekai Lana Tombe [MSc]

Zimbabwean Sekai Lana Tombe has won the 2013 L'Oréal-UNESCO Regional Fellowship For Woman in Science which honours female scientists from across Sub-Saharan Africa for their work.

Tombe, a PhD candidate in Chemistry and Physics at South Africa's University of the Western Cape, was awarded a fellowship of 15,000 Euro to contribute towards her research along with ten other winners from across the African continent.

She said the award would help her further her career.

"It will allow me to maintain my standard and level of excellence, and provide access to state-of-the-art research facilities for the successful completion of my project," Sekai Adds.

"it is a solid step towards my future career as a renewable energy scientist."

The ambitious 27-year-old held down three jobs as a sub-warden, tutor and demonstrator at Rhodes University just to fund her undergraduate studies.

Her dedication paid off, as she completed all three degrees, including a BSc, BSc (Hons) and MSc (with Distinction) in chemistry at Rhodes.

Samuel Chigome [PhD]

I studied under the supervision of Prof Nelson Torto and stayed on for a year as a Post Doctoral Researcher. What I liked most about the Chemistry Department is the culture "TEAM CHEMISTRY" that cultivates a sense of togetherness.

Departmental presentations, Barker Lectures, Guest lectures, departmental functions and tea room discussions were all important for my personal and professional development. Prof Torto being a well known researcher internationally afforded me the opportunity to be involved in a number of collaborative research projects with people from all continents. I was fortunate enough to travel to the UK and USA to attend international conferences where I rubbed shoulders with world renowned researchers. In addition, through attending a multitude of conferences in Africa, I was able to establish networks with fellow African Chemists with the aim of making our continent a better place through science. My research work involved a lot of fabrication, having dedicated technical people like Mr Andre Adriaan and Mr Francis Chindeka who seemed to have a solution for every design challenge. Lastly, the opportunity to mentor honours students and the weekly research group meetings helped me to develop supervision skills such that I am confident I received sufficient training that will be useful when I start my own research group.



Visiting Fellows

A few familiar faces have been added to the illustrious group of Visiting Fellows at Rhodes, including

Professor Nelson Torto

PhD FRSC FAAS,

Professor Torto is now heading up BITRI, the Botswana Institute for Technology Research and Innovation as its Chief Executive Officer.



Dr Edith Antunes

I am currently a senior researcher in the School of Pharmacy at the University of the Western Cape.

Prof Zenixole Tshentu

Associate Professor of Analytical/Inorganic Chemistry, Chemistry Department, Nelson Mandela Metropolitan University, Port Elizabeth.

Professor MT Davies-Coleman

Professor MT Davies-Coleman (PhD, FRSSAf)

Dean of Natural Sciences, University of the Western Cape

Frontiers of Science 2014

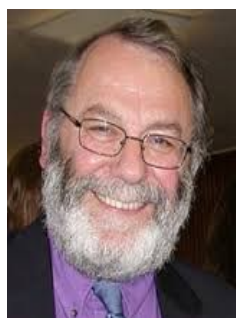
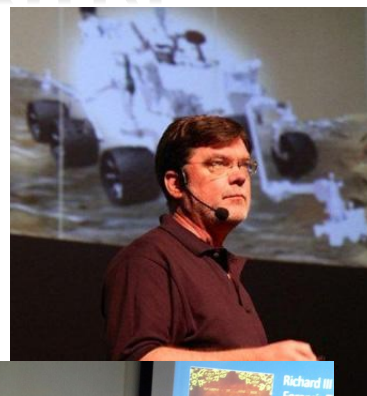
We once again hosted the Frontiers of Science lecture series.

The lecture series were welcomed by staff and students from the University, the following talks and international speakers presented:

Jim Adams

Finding Life Beyond Earth

NASA USA



Professor Sir Peter Knight

Light wave-Particle duality: from Newton to Quantum Optics

Imperial College London UK

Professor Sarah Hainsworth

Richard III – Modern Forensic Techniques Applied to a 500 year old King

University of Leicester UK



Professor Eric Wilcots

The Monster's Fiery Breath: Jets, Feedback, and the Ecosystem of Groups of Galaxies

University of Wisconsin-Madison USA



SASOL
reaching new frontiers

Thermal Analysis

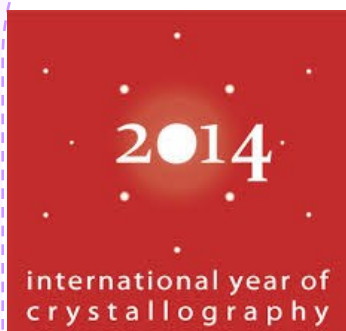
Prof (emeritus) Mike Brown, a world leading thermal analyst (and Rhode's first NRF A-rated academic) established the chemistry department as a centre of expertise in the technique of thermal analysis. The technique allows the study of the stability of compounds with temperature change. TGA looks at decomposition of compounds which, when coupled with infrared spectroscopy (hence TG-FTIR), expands the ability to investigate the chemistry of materials. DSC is another thermal technique that allows the measurement of the energy involved in chemical and physical change within materials.

The chemistry department has recently purchased new thermal analytical equipment to the tune of Rand 1.2 million, courtesy of financial support from Rhodes and SASOL. This allows the replacement of both the old TG-FTIR and the DSC, which has serviced the university for the last thirty odd years. The new equipment will largely be used by Prof Watkins' MOF group (the study of nanomaterials of interest in separation science and renewable energy), and Profs Nyokong's and Krause's groups (studying nanofibers), as well as be used by several groups interested in drug stability, both within the department and the Pharmacy Faculty.

Strategic Planning 2014

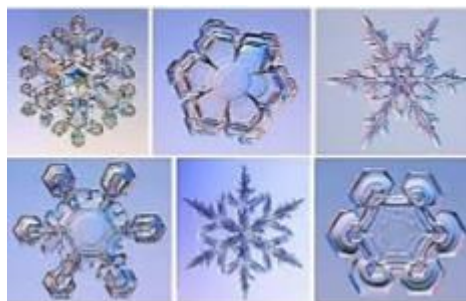
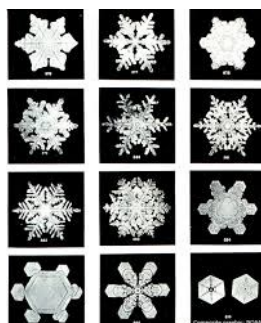


2014 is the International Year of Crystallography

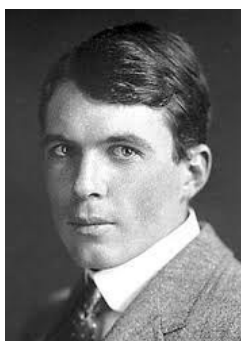


This year celebrates the centennial of the discoveries around the diffraction of X-rays by crystals. This led to what we now call crystallography and X-ray spectroscopy. Two Nobel Prizes were awarded for this, one in 1914 to Max von Laue for his work on X-rays a few years earlier, and the other to the Braggs (father and son), in 1915.

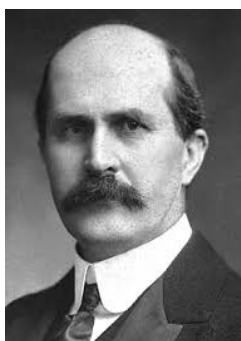
The year also commemorates the 400th anniversary of Kepler's observation around 1611 of the symmetrical form of ice crystals, a study that led to a better understanding of the role of symmetry in matter in general.



Kepler and ice crystals



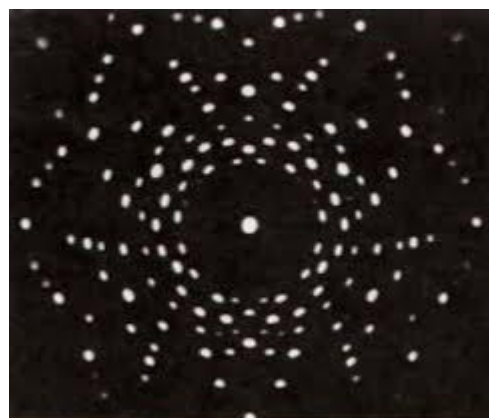
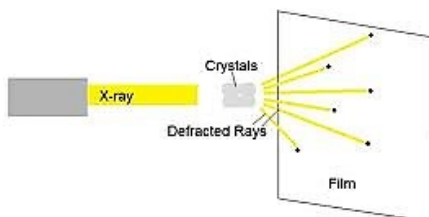
The Braggs



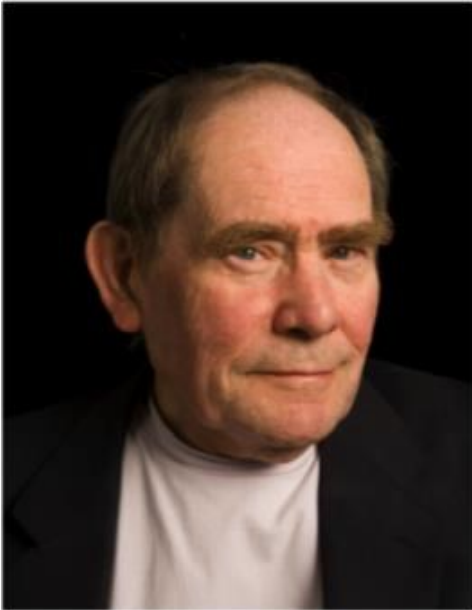
and von Laue



There are many events planned for the year, including some exciting events in the Chemistry department, together with our partners Bruker. Dr Mashazi recently spent a week in Germany training on the latest Bruker systems.



Sidney Brenner



This year Rhodes is very honoured to be awarding an Honorary Doctorate to Sidney Brenner.

Sydney Brenner, CH FRS (born 13 January 1927) is a South African scientist and a 2002 Nobel prize laureate in Physiology or Medicine, shared with H. Robert Horvitz and John Sulston.

Brenner made significant contributions to work on the genetic code, and other areas of molecular biology while working in the Medical Research Council Unit in Cambridge, England.

He established the roundworm *Caenorhabditis elegans* as a model organism for the investigation of developmental biology, and founded the Molecular Sciences Institute in Berkeley, California, U.S.

Brenner is a remarkable scientist and the following extract from an autobiography on the “Nobel Prize website” hints at his brilliance.

“I start with my birth on the 13th January 1927 in a small town, Germiston, in South Africa. My parents were Jewish immigrants from Eastern Europe; my father came to South Africa from Lithuania in 1910, my mother, from Latvia, in 1922. My father was a shoe repairer and our first home was in some rooms at the back of his shop. He never learnt to read or write but, in addition to English, Yiddish and Russian, he learnt to speak Afrikaans and Zulu. I learnt to read at an early age, and a customer of my father, Miss Walkinshaw, persuaded my father to allow me to go at the age of five without charge to her kindergarten. I completed the first three years of primary school in one year and was admitted to the local school the age of six directly into the fourth year, some two years younger than all my contemporaries. After 4 years in primary school, I went to Germiston High School where I matriculated in December 1941, just before turning 15.

During this time I discovered the Public Library in Germiston... It was here that I found a source of knowledge and the means to acquire it by reading, a habit of learning which I still follow to this day. I also became interested in chemistry and gradually accumulated enough test tubes and other glassware to do chemical experiments, using small quantities of chemicals purchased from a pharmacy supply house. ...and tried to discover what gave flowers their distinctive colours. I made the (to me) astounding discovery that the pigments I extracted changed their colours when I changed the pH of the solution.

I learnt physical chemistry with Joel Mandelstam (later Professor at Oxford University), Raymond Dart and Robert Broom taught me anthropology and paleontology, I stayed on for two more years doing an Honours degree and then an M.Sc., supporting myself by working part-time as a laboratory technician. I read many books and taught myself many subjects during this period, learnt how to build equipment and how to do experiments, I also began to publish papers. My scientific bibliography begins in 1945 with a paper published with Joe Gillman and his brother, Teddy, but my first paper as sole author appeared in 1946.... My M.Sc. thesis was in the field of cytogenetics, another self-taught subject, and this was the beginning of my research in genetics. This background was to serve me well in later years when I became a molecular biologist.



MRC Laboratory of Molecular Biology
Brenner and Crick signing their blackboard at MRC's
Laboratory for Molecular Biology, 1985.

... I was not a good medical student and had an erratic career, brilliant in some subjects, absolutely dismal in others. In my final year I failed Medicine, scraped through Surgery but got a First Class in the third subject, Obstetrics and Gynecology. I had to go back and repeat Medicine and Surgery and six months later, in July 1951, I finally received the degrees of MB BCH. I had already decided that I would do research and that I needed to go abroad. H. Raikes, head of the University of Witwatersrand, who was originally an Oxford trained chemist, advised me to write to **C.N. Hinshelwood**, the Professor of Physical Chemistry at Oxford University, who had interests in the applications of physical chemistry to biology. That sounded closer to what I wanted to do. Hinshelwood had written a book called the "Chemical Kinetics of the Bacterial Cell" which I read and thought was in the direction I wanted to go. He accepted me and suggested I work on bacteriophage resistance in bacteria. I immediately began to read about bacterial viruses and in October 1952 I arrived in Oxford to do a Ph.D. in the Physical Chemistry Laboratory.

There was still food rationing in England and life was difficult all through my 2 year stay in Oxford. In addition, I and the others were outsiders three times over; we were scientists, we were research students and we were colonials. Many of my friends in Oxford shared these stigmata and the only compensation was the opportunity to join Halifax House and lunch there. This was where I met Jack Dunitz, a crystallographer, and through him Leslie Orgel, a theoretical chemist, both of whom have remained lifelong friends and colleagues.

We had many discussions on DNA, for I had come to Oxford with two half ideas both of which were more than half wrong. One was a way of working out the structure of DNA using dyes and the other was how nucleic acids could participate in the synthesis of proteins. I can remember in November 1952 Jack telling me about two fellows in Cambridge who were going to solve the structure of DNA. When in April 1953, Jack told us that these two fellows in Cambridge, **Francis Crick and Jim Watson**, had indeed solved the structure of DNA, Jack, Leslie and I drove to Cambridge on a day between the 16 and 18th April to see the model.

This was the watershed in my scientific life. The moment I saw the model and heard about the complementing base pairs I realized that it was the key to understanding all the problems in biology we had found intractable - it was the birth of molecular biology. It was a revelation reinforced by conversing with Jim Watson at greater length during a walk we took together, when I realized that working with bacteriophage had put me on the right road to enter this exciting new field, even though what I was doing was trivial.

My wife and I were married in London in December 1952 and she was also engaged in doing a Ph.D. in Psychology in London. She was allowed to move to Oxford and, until June 1954, we lived in a flat in Woodstock Road working on our theses, had a child in addition to my stepson, Jonathan, dreaming all the time of food and the warm climate of our native South Africa.

Over the next 10 years, Brenner, Crick, Orgel and colleagues carried out a wonderful series of experiments directed at understanding genes and the genetic code. One set proved unequivocally that the code was made up of triplets of nucleotides. Brenner described these experiments in his autobiography as "one of the most beautiful ... aesthetically elegant experiences of my life."

Dr Mashazi Goes Abroad

The year 2014 has been declared the International Year of Crystallography (IYCr2014). This year, Crystallographers around the world commemorate in honour the centennial of the birth of X-ray crystallography, thanks to the work of Max von Laue who received the Nobel Prize in 1914 for his experimental work. In his experiment, von Laue demonstrated how the X-rays travels into the crystals interact with it and are diffracted in particular directions depending on the nature of the crystal. The year 2014 has been declared the International Year of Crystallography (IYCr2014). This year, Crystallographers around the world commemorate in honour the centennial of the birth of X-ray crystallography, thanks to the work of Max von Laue who received the Nobel Prize in 1914 for his experimental work. In his experiment, von Laue demonstrated how the X-rays travels into the crystals interact with it and are diffracted in particular directions depending on the nature of the crystal. A year later (in 1915) William Henry and William Lawrence Bragg related the directions and intensities of the diffracted beams to the atomic structure of the crystal. The Braggs showed that the X-rays can be used to determine accurately the positions of atoms within the crystal and thus unravel its three-dimensional structure. Undoubtedly all these discoveries have contributed to the modern development of all the natural sciences, because atomic structure governs chemical and biological properties of matter, and the crystal structure determines most of its physical properties. Several breakthroughs have been accomplished as this year further commemorates the 50th anniversary of another Nobel Prize winner awarded in 1964 to Dorothy Hodgkin for her work on solution of the structures of proteins of profound biological importance, such as myoglobin, haemoglobin, insulin, vitamins, etc. This is without playing down the contributions of various researchers that have utilized the crystallography to discover the important structure of DNA as double helix biological molecule by Watson and Crick based on an experiment performed by Rosalind Franklin.

Rhodes University (Chemistry Department) is also recognizing and participating in this year's event IYCr2014. On the Chemistry Calendar, Dr Mashazi visited Bruker AXS Germany for training on their new crystallographic systems (Bruker's SMART X2S). All the travelling arrangements were paid for by Bruker South Africa. Dr Mashazi spent a week (17th – 21st March 2014) in Germany. In-line with the training Bruker will be leasing out their equipment (Bruker's SMART X2S) to Rhodes University for a duration of a year 2014. This will allow for researchers to utilize the equipment and the training will be provided for by Dr Mashazi to interested parties. Dr Mashazi has also been lecturing Chemistry 302 Crystallography module since October 2013. The availability of the equipment will be quite useful for the practical demonstration to third year students during the Crystallography Module in 2014. Furthermore, researchers will be encouraged to utilize the equipment whilst it is on-site for their projects. The logistics of how the equipment will be utilized will be later and upon equipment delivery.

Additionally, in countries with a small base of installed instruments the OpenLab initiative will provide instrumentation to a number of sites. Bruker will contribute loaning a SMART X2S for the entire year 2014. Education and research at sites in Ivory Coast, South Africa, Morocco, Indonesia & Brazil will benefit from this single crystal X-ray diffraction solution. The system will be covered by a free-of-charge service contract and warranty. Personnel from each site will receive training prior to the arrival of the instrument and get unlimited support by Bruker's service desk. South Africa was represented by Dr Mashazi and the colleagues from other countries also attended. This was also a great opportunity for networking with Bruker management, their engineers, applications and research scientist who were eager about their work and were willing to answer all the questions we had.



Bruker's SMART X2S

IS THERE LIFE AFTER RETIREMENT?

Emeritus Professor Mike Brown

When I retired in 2003 after over 40 years of service at Rhodes, I had achieved my major goal of getting an A-rating by the NRF (the first at Rhodes) although I knew that all the major funding and support, that is supposed to accompany this rating, had come too late. For three years after retirement I continued to run the third-year industrial project and during this time collected all my publications together and submitted them for a DSc degree. This was accepted and my DSc thesis was the first digital version submitted at Rhodes and has been accessed an amazing number of times. Getting all of my publications together and putting them into perspective gave me a sense of completion and my interests turned to other things,

I did enjoy doing the research and also teaching, especially Honours students. On the other hand, in common with most academics, I loathed setting and marking exams. Best of all though was seeing research students “grow” scientifically in front of you. My best PhD student was a far better researcher than I am and some years after he graduated I spent part of a sabbatical working for him! At one stage he even suggested that I should “try to keep up”.

I also enjoyed my two terms as Dean of Science. It was always a challenge to see how the problems of students could be solved to their advantage. Sometimes this required working on the established principle that “it is easier to seek forgiveness than permission”. I’ve always enjoyed the saying that “Old Deans never die, they simply lose their faculties”.

Writing and editing books were a major enjoyment and even brought in a little financial reward. Over the years my books have probably sold as many copies as John Grisham would in half-an-hour on a really bad day! Sabbaticals in other countries, attending international conferences and serving on international committees were other academic perks.

Since retiring I have read more books (fiction and non-fiction) than I ever found time to do while working. This has brought tremendous enjoyment – no graphs or tables of statistics and lots of imagination. I had hoped to play more bowls but my ageing legs have prevented that. My part-time hobby of woodworking has become a major activity and there are lots of talented woodworkers in Grahamstown who are very willing to pass on their skills. I have had three woodworking articles published in local magazines but I regret that these bring in no subsidy.

I can’t remember a day in the last 10 years when I have wondered what to do with my time. The question has always been “which of this list of possibilities do I do next?”



CHEMISTRY CALENDAR

Friday 11 April 10h00

Masters – Graduation

Friday 11 April

Graduation tea party (17H30 Drostdy Dining Hall)

Saturday 12 April 10h00

PhD & Bachelor of Science Graduation

Monday – Friday July

Barker Lecture

Monday 13 October

Honours Project Presentation - Chemistry Minor

Tuesday 14 October

Honours Project Presentation – Zoology Major

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