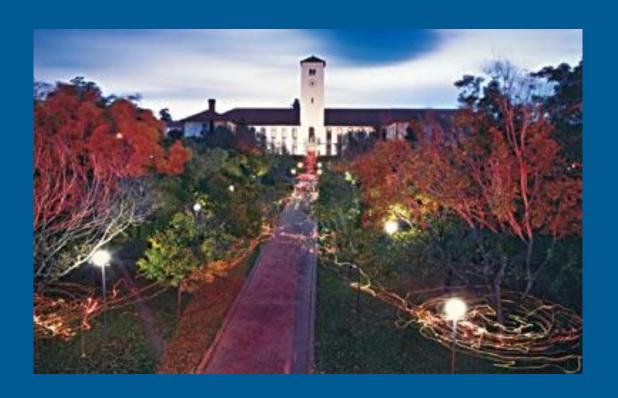


RHODES UNIVERSITY Where leaders learn







Message from the HOD



Welcome to 2021 with the Department of Chemistry,

Introduction

There is no need to mention the many aspects of living through 2020 as an academic Department, as researchers, or simply as people. The challenges and restrictions resulting from the COVID-19 pandemic are well understood. We are grateful to have been a part of this University at this time, enjoying the benefits of being part of a vibrant and caring community who continue to make an effective contribution to the Makhanda community and to the scientific community. Nonetheless, the limits on our personal freedoms did not fail to have an effect. In addition to the limitations resulting from the global pandemic, the Department of Chemistry was obliged to bid farewell to four staff members, including the retirement of Prof Gary Watkins. In the light of those challenges, I am very proud of the achievements of the Department in maintaining a high publication rate and continuing to supervise and graduate students. As always, the many collaborations between members of the department, and with colleagues in other departments, has helped to strengthen our efforts and multiply our rewards. For those of you who have graduated in the past year, there is a special sense of having defeated the odds, while working in isolation, and seeing such great loss all over the world.

The outstanding work of Distinguished Professor Nyokong and the Institute for Nanotechnology Innovation contributed extensively to the publication output of the Chemistry community at Rhodes University, and to the creation of knowledge in photodynamic therapy and other applications of nanotechnology.

Recognition is also due to the ongoing collaboration between Professors Dorrington and Krause, working on efforts to discover new antibiotic agents from our extensive library of bioactive compounds and the plethora of marine sources collected over the past thirty years. Although the next new drug has not been discovered yet, the project continues to make progress and gain momentum

Research in the Department of Chemistry enjoys the support of a large support staff contingent, including two able storemen, two instrument technicians, and a carpenter. In addition to maintenance of the impressive suite of instruments housed in the Institute for Nanotechnology Innovation and the Department of Chemistry (ranging from Mass Spectrometers all the way to hot plates), our technicians enable us to modify and develop small electronic devices for innovative analytical and synthetic applications..



Outstanding reputation for teaching and research

Another by-product of the global pandemic was a growing suspicion of science. This has made our work as teachers and learners essential, and we are proud of the fact that we have had all our students back in the laboratories for practical work in 2021, and we have continued to build up an impressive array of learning materials for all our undergraduate courses and honours.

"In order to succeed you have to do well and perform well. Don't do less and accept less. Put in the time and complete the task. You want to be a contributing member to every group you are part of." (Jeanette Epps, Astronaut and Aerospace engineer).

It is not enough to be part of a productive group, but each member of our collective makes a contribution to the productivity that we have enjoyed. The members of our department, both full time staff and tutors and demonstrators, have made a strong, considered, and valuable contribution to teaching and learning in the Department in 2020 and 2021. The standards are set high, and we have put in the time to finish what we started. Our graduation rates are very similar to what they were before the pandemic, and our standards are just as high. We have reintroduced entrepreneurial projects in second year, and we hope to restart our research internships at third year in 2022.

Significant Research Aligned Events

As the doors closed in March 2020, two grants were awarded to the members of the Department. Dr Vincent Smith and Prof Rui Krause were awarded Rio million from the National Equipment Programme towards the purchase of a new Single Crystal X-ray Diffractometer – the first of its kind at Rhodes University. This instrument will be invaluable to several ongoing projects in medicinal chemistry and materials chemistry in the Faculty of Pharmacy and the Department of Chemistry. It will also be available to members of the scientific community throughout the province of the Eastern Cape, as is the case with several of our scientific instruments. We will be having a launch of the instrument suite soon (watch this space!) now that it has been installed in the Physics building,

and we look forward to many years of happy collaborations between Chemistry and Physics as a result.

The Technology Innovation Agency awarded a seed grant to Prof Rosa Klein for the development of environmentally friendly household products, a project which is aligned with the Department's commitment to increasing sustainability and research in Green Chemistry. We look forward to seeing the fruit of these efforts, hopefully on our supermarket shelves!



Through the course of 2021 we appointed two new staff (have a look through the newsletter for introductions to our new staff). We look forward to seeing the new directions and creative contributions that come through the Department of Chemistry in the years to come.

Postgraduates / Graduations

Students from the Department of Chemistry took part in both graduation ceremonies for 2021, with one MSc, one MEd and, three PhD students in April and seven MSc and six PhD graduates in October. The quality of the theses remained high, with four distinctions among the master's graduates.

Research at both masters and doctoral level covered topics ranging from treatment of tuberculosis and malaria to photodynamic therapy in the treatment of cancer and bacterial infections.

Professor Rosalyn Klein Head of Department



In April, Rhodes held its third virtual graduation ceremony and graduated: Mr Donovan Mafukidze (PhD), Mr Lekhetho Mpeta (PhD), Ms Esther Agunbiade (PhD), Mr Collen Makola (MSc, with distinction), and Mr Willliam Kakambi (Med).

In October, at the second graduation of 2021, Mrs Abosede Adewumi (Idowu) (PhD), Ms Teresa Cossa (PhD), Mr B Diallo (PhD), Ms Refilwe Matshitse (PhD), Ms Sivuyisiwe Mapukata (PhD), Ms Ayanda Zulu (PhD) graduated in the fourth virtual graduation along with Mr Somila Dingiswayo (MSc, with distinction), Mr Shaun Hartley (MSc), Mr Otto Joseph (MSc), Mr Gwiba Makalima (MSc, with distinction), Mx M Mbunge (MSc), Ms Lukhanyiso Nqeno (MSc, with distinction), and Ms Keamogetse Tshenkeng (MSc).

Welcome to New Staff Dr Tendamudzimu Tshiwawa



I completed my BSc at the University of Venda in 2010, and mγ Honours at the same university in 2012. I started working as an educator at a nearby secondary school where I teaching was chemistry section of high school physical science in grade 10 and 11 during the week, and grade 8

and 9 on weekends (Saturday school). I began my MSc at the University of Venda that same year when I was teaching. The following year I decided to go back and focus on my MSc full time. After completing my MSc I came to Rhodes university where I enrolled for a PhD in chemistry (2016), which was conferred in 2019. I then began my post-doctoral fellowship at Rhodes University from 2019, until I took up a position here in the department of chemistry as a lecturer, this year of 2021.

My research interests are in molecular modeling, ethnochemistry, chemical education and green chemistry. My research focus is on molecular modeling in cardiovascular biology and cancer, searching for new drugs in the ongoing fight against these diseases.

My hobbies include watching documentaries and 'how to' YouTube videos, fixing and restoring broken things, trying new recipes, gardening, walking, and reading (history, ethnics, political, sci-fi and of course science books)



Dr Mpondi Molefe

BSc, BSc(HONS)(UNITRA), MSc, PhD (UFS)

I joined Rhodes University in March as a first year chemistry and 2nd year inorganic chemistry lecturer

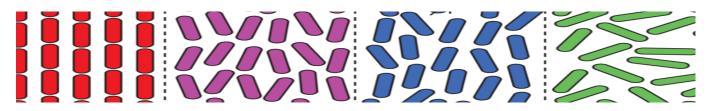
from the University of the Free State.

At the University of the Free State, I lectured Inorganic Chemistry, in particular coordination chemistry, a position I held for the past 13 years. I lectured in other fields of chemistry before this, giving me 16 years of lecturing experience. Prior to lecturing, I was an educator of mathematics and physical science at St James High school for 3 years. I have therefore a reasonable experience that gives me confidence to articulate proper knowledge with a variety of students both young and old from different backgrounds. I therefore have a great passion for students - Rhodes University added amongst their staff a lecturer of quality and excellence. When I joined the University of the Free State as a junior lecturer, I was, and still am, determined to develop in academia, both as a lecturer and a researcher and as such I enrolled for a Master's degree followed by a PhD. I studied both my MSc and PhD part-time and I had a baby boy in the middle of my MSc and another in the middle of my PhD studies, I am therefore a proud wife and a mother of two boys 12 and 8 years respectively. My postgraduate studies were the most challenging in my career, however, I developed an important skill to be able to juggle between several roles and still have a reasonable balance.

The research expertise I obtained during my MSc studies, among others, was chemical kinetics and thermodynamic studies of transition metals especially rhodium for catalytic application. PhD

studies further enhanced my understanding through electrochemical, phase change and computational chemistry of rhodium complexes. One of the most significant moments in my career was when I attended an International Conference on Liquid Crystal Conference (ILCC 2016) held in Kent State University, Ohio, USA in 2016. I participated in this conference because I found some of my compounds I synthesised during my PhD showed liquid crystalline properties and triggered an interest in the field. It is at this conference that I secured a significant international collaboration with Prof Funahashi Masahiro from the Department of Advanced Materials Science, Faculty of Engineering, Kagawa University in Takamatsu, Japan. Professor Funahashi invited me as a guest lecturer in his laboratory in July 2017. A NQF level 8 course on Strengthening Doctoral Supervision through Rhodes University offered by Nuffic (which is the Netherlands organisation for international cooperation in higher education) gave me a lot of confidence for postgraduate students' supervision which I am ready to share with the chemistry department at Rhodes. I am particularly impressed by Rhodes Chemistry department's commitment to excellence, development and relevance of scholarly engagement. I am confident that my expertise as an educator/lecturer, my consistent developing research experience, my focus on a multidisciplinary approach and my strong organisational and influencing skills will add some value in our department.

I enjoy fun time with my family especially travelling and my "me" time means watching a good movie. (Liquid crystal phases illustrated below)





Congratulations to Choonzo Chiyumba 2021 James Moir Recipient

"Experience is what you get when you didn't get what you wanted, and it is often the most valuable thing you have to offer." — Randy Pausch.

After several attempts of scholarship applications that were not successful and my home (Zambia) degree being degraded to a diploma by most universities, I decided to save up money for school. To cut the long story short, I ended up at Rhodes and being an international student, it was not easy to top up from what I had saved. And people discouraged me because I had put all my eggs in one basket. With this in mind, I worked hard to be the best that I can and attain a world-class education with good results and guess what I did, I was the best chemistry honours student. Due to this, I was granted a scholarship and I will be receiving James Moir Medal.

I am currently doing a Masters by research in chemistry on the development of BODIPY agents for anticancer photodynamic therapy (PDT) and I look forward to pursuing a PhD on metallodrugs as anticancer medicines.

Like mom always says, "education makes your successes way much easier".



Congratulations to our Top 2020 students

Best 1st Year: Ms Emily Morgan Best 3rd Year: Ms Kristen Burgess

Best 2nd Year: Ms Everjoy Nleya Best Honours: Choonzo

Chiyumba



2021 Teaching Challenges

When we were first locked down in 2020, we thought that we would quickly move back to 'normal', but, of course, 18 months later, we know there is no such thing as 'normal' any longer. Neither is a 'new normal' in sight, because often on Sundays at midnight, after a 'family meeting', we have to change our ways and times of doing things.

The Rhodes University academic year of 2021 started with inviting all first years on to campus, supplying those who needed them, with laptops, making videos of instructions on how to choose subjects and then many, many emails responding to students who had selected inappropriate curricula. However, students were then expected to stay in their rooms and listen to recorded lectures. No experience of sitting in a lecture theatre and sharing feelings of anxiety with fellow students or walking on campus, in groups, from one venue to another. And we lecturers had no idea what our students looked like!

The Science Faculty, together with Pharmacy, was soon allowed to have half-filled laboratories of students for practicals, of course with all safety protocols observed. Never before have I so looked forward to being in a prac before.



Our 2021 Honours students have found this year very difficult. Half of the class had not done their undergraduate degrees at Rhodes University, so did not know anyone, were not in res, and were not doing practicals, like the undergraduates. They were only allowed onto campus from the second term, and felt very isolated. Those who joined larger research groups were more integrated, but a few Honours students only met their fellow students when we had tea in the Botanical Gardens, since gatherings on campus were not allowed.

Community Engagement, in the form of the Khanya Maths and Science Club, in

collaboration with GADRA Education, has tried hard to continue. Rhodes Science students were connected with grade 9 learners at local schools, and they taught Maths via WhatsApp. Again, lack of resources increased the gap. Most learners' families have only one smartphone, which must be available for the learner at predetermined times for the lesson to take place. Our students struggled, and persevered, to connect with the learners. I am in awe of both the students and the learners who continued, and by all accounts made headway.

Now we are in the fourth term of 2021. Chemistry 1R1 and Honours have been given permission to do face-to-face lectures this term. Now the lectures start with sanitisers, thermometers, and the Higher Health App check. Again, time for change.

Assessments have, and still are, a real problem. In June, all Chemistry exams were online but, as at all Higher Education Institutions, we are worried about the integrity of our students and thus the validity of the exam results. Students find all kinds of ways to beat the system. However, we are pleased that we have permission for the Honours students to write sit-down examinations.

The coronavirus pandemic has affected us all, and each person has reacted to the changing situation in their individual way. It has taught us about the value of human connections and resilience.

We know that 2022 will be different once again, maybe another wave, or maybe near-full capacity lecture halls with everyone showing their vaccine passports,



who knows? But what we do know, is that the Chemistry staff are there to ensure the best of Chemistry Education for their students.

Mrs Joyce Sewry - Deputy Dean of Science



Congratulations to our Post Graduates

Rhodes University have won the national *Three Minute Thesis* competition for the second year running - since that we only entered in 2020 and 2021, that's a pretty good innings!

Congratulations *Siphokazi Msengana* on her excellent presentation. She presented her



work on control of the cabbage pest, the diamondback moth, in an engaging and entertaining manner.

The Royal Society of Chemistry South Africa hosted a virtual

quiz, a 3 round, 20 questions quiz that consisted of general chemistry questions. After the total votes were added

Bafokeng Sekaleli came first. This is the first time a quiz of this kind was hosted by RSC.

Sodeeq Aderotimi Salami won best poster prize in green chemistry and catalysis.



This is a virtual event, which maintains and builds on the momentum and enthusiasm generated by the Commonwealth Chemistry Congress and brings the Commonwealth Chemistry

community together in a virtual environment that allows for collaboration, discussion, and engagement with other chemists from across the Commonwealth, working on problems that address Sustainable Development Goals.

Postgraduate News

This year brought some interesting challenges to already delayed academic and research programs. Trying to catch up and finish what needed to be done, was the aim for most postgraduate students, and for the newer students it was starting a postgraduate degree after spending almost a year away from a laboratory. New and pressure-filled experiences all around.

The return to something resembling normality has been well received and the work that can now



be done with ease, has slowly begun. This year can be seen as a year of adjustment and students have

taken it in their stride and made do with the cards they have been dealt.

The importance of support systems between students has also been shown in these times, and where we can, we give each other perspective, comfort and sometimes a reminder that there's still a bit more work to be done. A postgraduate student's life is a stressful one, but also one that can give you freedom to do many things. Sometimes the way in which you use that freedom is key. How well your research is going and how healthy in mindset and physically you are as a person are sometimes not related, and finding the balance in this endeavour is more difficult than one thinks.

Here's to a year much better than the previous and hopefully the start of better to come.



Technical staff operations during the Covid-19 pandemic

COVID-19 has changed the working environment, forcing organisations and employees to be agile and flexible. The Chemistry department technical support section had to quickly adapt to continue operating while minimising the spread of the Covid-19 virus, thus protecting employees. We had to evaluate the different tasks we do and determine which ones can be done from home and which ones require physical presence. We ended up with a hybrid environment with some staff members working from home, some working 100% at work and everything in between.

The supply of spare parts was, and still is, taking longer than normal. Although it was a difficult period, good things also evolved. As an example, Mr Monde Mafani, while working from home, was involved in the development and review of standard operating procedures and maintenance procedures, Mr Rubin Douglas did some carpentry work from home and Mrs Vuyiseka Makabe Manyati converted some practicals into online worksheets for virtual teaching and learning. Mr Sandile Sukula and other staff members took care of operations that required physical presence.

Below are some highlights about the Laboratory practicals and Chemistry stores.

Covid-19 impact on Laboratory practicals

We had fewer than normal practicals because students had to be split into 2 groups to ensure social distancing. The practicals were carefully selected and also some were covered virtually to ensure students practise most of the concepts they are taught in class. Big up to Mrs Vuyiseka Makabe Manyati for converting some practicals into online worksheets and Mrs Joyce Sewry for availing them online.

We had to use more gloves than normal because of Covid-19. It took longer than normal to record marks because the result sheets had to be put away for 2 days, before they were handled, as a precautionary measure to minimise the spread of Covid-19.

Covid-19 Impact on the Chemistry Stores

When Covid-19 first made headlines, we thought the wearing of masks, the 1.5 m social distancing and remote working were the only changes we were about to experience. Little did we know the impact

the pandemic will have on the global supply chain and our Chemistry Stores supply chain management.



Because of the unprecedented global pandemic, the Chemistry Stores team had to react rapidly to various unexpected disruptions. Some of the disruptions/ challenges that we faced are:

Maintaining lines of communication during remote working

To ensure efficient and effective communication between the Stores personnel, we had to rely more on technology, such as using WhatsApp groups for quick communication and having our weekly meetings via Zoom or Teams. We also had to forward our office phone calls to our cellphones, so that our suppliers and customers can easily reach us when they call. Relying solely on technology for communication came with its issues. With the main issue being poor connectivity at some of our homes.

• Overstock and Out-of-stock Issues

Traditionally, we had always used our history records to plan our future sourcing and purchasing. Now history was not the most reliable data to use for forecasting as some stock items that were previous fast movers became slow movers and those that were slow movers suddenly became fast movers. Not to mention a sudden demand for items we previously never stocked. Also, prices for some items drastically increased and we had to find ways to accommodate this price increase in our budget.



• Receiving and handling deliveries

Mr Dondashe and Mr Sukula played a vital role in ensuring that all orders were received. They were on standby and would quickly come and attend to the couriers. They would quarantine the deliveries for some time before opening and processing them, at the same time making sure to wear all the necessary PPE when handling the stock items.

We thank the HoD Prof Rosa Klein, Mrs Benita Tarr and all the Chemistry department staff for their support.

Honours Industrial Course



The Honours students were fortunate enough to have been taught a face-to-face module on the industrial perspective of analytical chemistry by Dr Heidi Duveskog. It was unlike any other chemistry module we have been exposed to, and that was the beauty of it. It was insightful, refreshing and very challenging. Heidi has a wonderful way of pushing you out of your comfort zone; she has very high expectations but is happy to teach you about the thinking involved in creating the bridges to a solution. The process is quite grueling, but only afterwards

does one appreciate the knowledge acquired and conversations had through the course. She is a charismatic teacher and she exudes passion for the chemistry she is unpacking; it is very easy to listen to her and engage with her.

After reflection, it is easy to appreciate the advantage that a course like this offers to a chemistry graduate: life within a chemistry career one day will look very different to what undergraduate (or even postgraduate) chemistry is capable of showing a student. This small insight into a potential future career in industry and what is required of one in terms of problem solving, interpersonal skills and technical skills was so useful and important. It emphasizes the need for a multi-faceted scientist; one who is capable of solving complex problems innovatively and can also be empathetic and communicative within a team.

The solutions to the complex questions that are asked of you are so easy to understand in hindsight, but Heidi pushed us beyond an undergraduate level of thinking. It was a tough week, but so much was learnt. We are very grateful.

Green Chemistry Champions



Rhodes University's Chemistry Department has made history by being the first department in any South African university to join the Green Chemistry Commitment programme. In signing this commitment, Rhodes University is joining over 70 signatories from 11 other nations (including Kenya and Nigeria) in a commitment to educating the next generation of chemists in Green chemistry. Green chemistry (GC) is the design of chemical products and processes that reduce and/or eliminate the use or generation of hazardous substances. This approach requires an open and interdisciplinary view of material and product design, applying the principle that it is better to consider waste and hazard prevention options during the design and development phase, rather than disposing, treating and handling waste and hazardous chemicals after a process or material has been developed.

As a signatory of the Green Chemistry Commitment, Rhodes University's Chemistry Department agrees to work towards adopting the Student Learning Objectives in its own unique way. Rhodes University Head of Chemistry, Associate Professor Rosalyn Klein said the Green Chemistry Student Learning Objectives are at the core of the Green Chemistry Commitment.

Professor Klein said the learning objectives focus on the 12 principles of GC, toxicology, practical application in laboratories, and practical application/engagement beyond the curriculum. "When I heard about this commitment, through the announcement by the University of Bath, I joined one of the Beyond Benign discussion groups, and I found that we are already doing so many of the things that are aligned with this commitment. We already have Green Chemistry principles embedded in our undergraduate programme; we already have aspects of our practical programme infused with Green Chemistry; and we already have Green Chemistry education as part of our community engagement activities," said Professor Klein.

By signing this commitment Rhodes University's Chemistry Department has committed to an ongoing programme of improving its curriculum with respect to the learning outcomes, and has committed to reviewing its course offering in stages over the next three years. This is to ensure that the department is more conservative in its waste production, water use (although the University already works very hard at this, given the current restrictions on water use), and to incorporate the 12 principles into more aspects of the curriculum.

"One of the things that is so exciting for me is that this is a perspective rather than a curriculum, and so we can commit to this approach at the same time as reviewing our curriculum for the purposes of Rhodes University's commitment to transformation and implementing the Institutional Development Plan. We are preparing our graduates to contribute to sustainable industrial development both locally and globally by teaching them how to do so with the cleanest footprint. I really believe that we are stewards of this earth and this is one of the ways in which we can do that. I am really proud to do this with my department," Professor Klein concluded.

Source: Communications



Vice-Chancellor's Distinguished Teaching Awards

The department of chemistry is honoured by the recognition of one our academic staff members, Prof Kevin Lobb, who has received the Vice-Chancellor's Teaching Award, given to excellent teachers who persevered during an extremely difficult time in the history of higher education.

According to Professor 'Mabokang Monnapula-Mapesela (Deputy Vice Chancellor), the award is made to those teachers who have been able to recognize the diverse needs of our students, motivate and inspire them to learn amidst immense challenges of the past two years. The award is made to individuals who have displayed selflessness in supporting students to become cocreators of knowledge in their disciplines; and who have adopted scholarly ways to continually innovate and improve their teaching.

Normally, two awards are made: one for academics with fewer than ten years teaching experience and another for academics with more than ten years of experience. A rigorous awards process is managed by staff of CHERTL. The committees that select the recipients of the Vice-Chancellor's distinguished teaching awards are made up of past recipients of the award. Each committee is chaired by a past recipient of the award.

Due to the unusual circumstances of the COVID-19 pandemic, nominations for 2020 were deferred to 2021.

In 2021, two special Vice-Chancellor's Awards were also introduced in the two categories (academics with more than ten years of experience and academics with 10 or fewer years' experience



for creative, innovative online/remote teaching courses, which succeeded in catering for their students' learning needs in the context of the COVID-19 pandemic). These awards will only be made in 2021.

In each category, academics were nominated for two awards. The first category was academics nominated early in 2020, mainly for their face-to-face teaching. The second was a special award for 2021, for individuals who displayed extraordinary resolve in redesigning, in a short space of time their courses for emergency remote/online teaching, leveraging technology to advance their teaching and ensuring that students still had a quality learning experience.

The recipient of the 2021 special Vice-Chancellor's Distinguished Teaching Award in the category of more than ten years' experience is our very own Prof Kevin Lobb in the Department of Chemistry, Faculty of Science.

These Vice-Chancellor's Distinguished Teaching Awards will be presented to the awardees at the 2022 April graduation.

Congratulations to our esteemed colleague !!!!

Long Service Awards

The department of chemistry is proud to announce the long service awards received by Prof Rosa Klein for 15 years of service to the department, Mr Francis Chindeka for 10 years of service and Mr Don Dondashe for 25 years of service. Well done and thank you to all of you.

*Th*e department of chemistry also gives a big thank you to Mrs Benita Tarr who has served this department with a companionate heart and patience for three decades this year! Devoting 30 years of her life to putting the needs of the department of chemistry ahead of her own.



Thank you notes to the department

From Dr Mpondi Molefe



Dr NF(Mpondi) Molefe hosted 3 of her MSc students from the University of the Free State for 3 weeks, Majabeng Sebotsa, Lethiwe Sokhela and Bongiwe Motswenyane. They got a very warm welcome by the department and are grateful for the scientific information they received during their stay. Prof Rui Krause's lab was very instrumental to the success of their visit. A huge thank you to the scientists from this lab: Dr Xavier Siwe-Nondou for his lecture on LC- MS/MS, Sino for running the experiments and giving insight and guidance to the students and Dr Jarmo Kalinski for a two-day training on the

necessary software and interpretation of results. All these colleagues went beyond their call of duty, and they are all highly appreciated.

All the above is a cherry on top of a warm welcome I received when I joined Rhodes University in April 2021. I can safely say I joined a great family.



Chemistry 2021 Photo

