

Faculty of Science News

Message from Professor Azwinndini Muronga Executive Dean of the Faculty of Science

As the year grows to an end, I would like to take this opportunity to wish the science faculty staff and students a relaxing festive season, to reflect on the year that has passed, and to have a look at what lies ahead for the Faculty of Science.

Our Faculty of Science students have worked very hard in studying for their qualification and attaining the maximum possible credits for the year. To those who are graduating in December, well done to you, we will meet at the graduation stage. To those whose graduation season came during Covid-19, we are pleased to see that 292 graduates will also have the opportunity to walk the stage during the Honorary Graduation celebrations.

We would also like to thank our staff members for their hardwork because the achievements of our students are also the achievements of our

staff. Thank you for your support, guidance and mentorship to our students, especially through the uncertain times. We also acknowledge that your return to campus on 15 September 2022 at the start of the fourth and final term of the academic year might have been a challenging adjustment after up to almost two-and-a-half years for some staff members. Therefore, we thank you for your patience, resilience, and commitment to our student's academic success throughout the pandemic and upon your return to campus and beyond.

This year has been filled with several challenges, but we have also had many celebrations. One of our main highlights is the Naming and Renaming programme of Nelson Mandela University. This year, on 20 July 2022, our institution marked five years since the name change, providing fresh impetus to reflect on our institutional

values, which include ubuntu, social justice and equality, and environmental stewardship. The naming and renaming project also included renaming student residences, faculty buildings and spaces, with many more to follow.

Our faculty embarked on the naming exercise in the buildings where we operate. To those who will be around from 28 November to 23 December, the Faculty of Science will be abuzz with activities across the newly renamed Inkanyezi (Building 127), Katherine Johnson (Building 13), and Mvezo (Building 12) buildings.

The 7th edition of the biennial African School of Fundamental Physics and Applications (ASP2022) organised and hosted by Nelson Mandela University. We will be hosting about 100 science students from across the continent and 50 local, regional and international scientists for summer study as part of ASP2022.

The duration of the school allows for extensive networking among students and between students and lecturers. The program also includes activities for high school educators and learners.

The central long-term objective of the ASP School is to help improve higher education in Africa across national borders and in doing so, to contribute in a significant way to the development of science and technology on this continent.

At year-end, the Faculty is hosting the annual National Institute for Theoretical and Computational Sciences (NITheCS) Internship Programme 2022/2023 with about 50 participating students and tutors from various universities in South Africa. During the first two weeks, the participants will be part of the continental ASP2022. Here they will be lectured on different topics that are important for their



Prof Azwinndini Muronga

internship and other topics of general interest.

During the remaining weeks, they will be participating in interdisciplinary research projects requiring maths, physics, statistics and computing science skills.

All these activities form part of the Faculty's ongoing celebrations of the International Year of Basic Sciences for Sustainable Development (IYBSSD 2022/2023). We have registered our activities with UNESCO.

Now, as we take a few days of rest, we need to remember the words of Nelson Mandela: "...I have discovered the secret that after climbing a great hill, one only finds that there are many more hills to climb. I have taken a moment here to restbut I can only rest for a moment, for with freedom comes responsibilities, and I dare not linger, for my long walk is not ended."

Those of you who are returning to campus next year, remember to



pause, take stock, reflect and enjoy some well-deserved relaxation time to restore your energy so that you can return refreshed in 2023 to climb the next set of hills for 2023. And those who are going to join the workforce we wish you all the best.

Thank you all again. Keep well and keep safe!

Famelab 2022 Winner: Dr Nehemiah Latolla

Treating diabetes using the old ways

Originally published by Communication & Marketing

Diabetes is the second leading cause of death due to disease in SA, after tuberculosis. Finding ways to treat diabetes using indigenous knowledge about natural remedies has won Dr Nehemiah Latolla of Nelson Mandela University a place on the world stage of science communicators.

Dr Latolla was chosen as FameLab SA 2022 winner during the national leg of the International FameLab science communication competition held on Monday evening, 17 October 2022. As the national winner, he will represent South Africa in the International FameLab 2022 competition in November 2022.

During the FameLab South Africa Final, ten young scientists showcased research from some of the top academic and research institutes across the country in a way that non-experts can follow along and enjoy. The ten finalists each presented a three-minute talk about their research using props and simple language. The talks shared a glimpse into the lives of young researchers in South Africa and the impact that they hope to have through their studies and work. FameLab is the biggest international competition that seeks and supports science communication talent. This year marked the celebration of the 10th season of FameLab in South Africa.

Dr Latolla, a postgraduate researcher at Mandela University, charmed the judges with captivating storytelling skills and his passion for tapping into the wealth of SA's indigenous knowledge about natural remedies to treat diabetes. His research in phytochemistry focuses on evaluating the safety and efficacy of natural products to treat diabetes. "SA has about 30 000 recorded plant species of which approximately 3 000 have the potential for medicinal use. However, there is a lack in the reported chemistry, safety, and efficacy of these medicinal plants," according to Nehemiah.

First runner-up, Johanné Marais from the University of the Witwatersrand, seeks to address sleep deprivation due to HIV treatment with her sleep neurophysiology research. Second runner-up, Onesimo Mtintsilana, also from the University of the Witwatersrand, is a particle physicist and the student representative for the Women in Physics in SA



Dr Nehemiah Latolla

Forum. Mtintsilana is also a tour guide at CERN (European Council for Nuclear Research) in Switzerland where she introduces people to this multinational particle physics research institute's mission and achievements.

In reaction to his win, Nehemiah said: "We truly had a team of great ideas and science communicators in the competition this year. I feel very honoured to be able to move forward and represent this group." He expressed his gratitude to the organisers and his enthusiasm about competing alongside other country winners in the international competition. "I will give my best to showcase the richness of thought and innovation South African scientists have to offer," said Nehemiah.

"I also strongly feel that as tax-funded researchers, we owe it to the tax-payer

"I will give my best to showcase the richness of thought and innovation South African scientists have to offer"

to communicate our science in an unambiguous way, as COVID-19 showed us how important it is for scientists (not politicians) to come forth and address the public on the sciences involved in any particular case," said Nehemiah when asked about the importance of science communication. "I see FameLab as paramount in helping develop myself to effectively communicate with the communities I work with."

The judges for the final event, all experienced role-players in the South African science communication landscape, had no easy task in selecting the top contestant from the group of finalists this year. The FameLab competition offered all contestants the opportunity to hone their communication and presentation skills to engage the public with their

research starting with training and participating during heats held at various institutions earlier this year. All contestants were encouraged to continue their new roles as ambassadors of their research and to find opportunities to talk about their research outside their academic spaces.

FameLab, an initiative of Cheltenham Festivals in the UK, has been running in South Africa since 2013 through a partnership between the South African Agency for Science and Technology Advancement (NRF-SAASTA) and research communication specialists, Jive Media Africa.

The International FameLab Final in which Nehemiah will be participating will be streamed live on YouTube on 25 November 2022 at 11h00.

Nelson Mandela University students attend international conference in Chile

Written by: Avelile Cishe

Two Forestry and Wood Technology students from Nelson Mandela University of the George Campus recently attended the 50th International Forestry Student's Symposium in Chile. This is one of the world's prestigious student events in forestry. The main aim of the event was to learn about forestry and the management of natural resources of Chile, with specific focus on the sustainability of the forest sector. Furthermore, the event was aimed at networking and exchanging ideas among different delegates from all over the world.

Delegates from over 30 countries, to mention a few, Germany, Czech Republic, Romania, Estonia, United Kingdom, Canada, Finland, Slovakia and others attended the event. Avelile Cishe and Ronewa Sathuma represented Nelson Mandela University, Stellenbosch University, University of Pretoria, University of Venda, Fort Cox College of Agriculture and Forestry, South Africa and Africa in the conference. This was made possible by funding assistance from the

"The South African forestry industry plays a positive major role in the climate debate and other global environmental concerns like that of water quality and soil degradation"

Nelson Mandela University, the Department of Forestry, Fisheries and Environmental (DFFE), South African Forestry Contractors Association (SAFCA), Hans Merensky, and Forestry South Africa (FSA).

Some of the topics that were discussed in the congress include the future of forestry in the world, climate adaptation strategies, forest certification systems, wood science and wood products in support of the green economy, climate-smart forest technologies, forest trade and governance, water quality, and higher education policy and development. These topics are of significant value to the South African forestry industry.

"The South African forestry industry plays a positive major role in the climate debate and other global environmental concerns like that of water quality and soil degradation," says Avelile who presented about the role of forestry in solving major environmental threats.



Avelile Cishe in Chile



Tree planting

A Glimpse into The Palaeolab

Written by: Asithandile Ntsondwa

The Palaeoecological laboratory is a processing lab primarily focused on palynological (including pollen, charcoal, diatom, and fungal spore processing) studies within the southern Cape coast of South Africa. The goals of the Palaeolab extend beyond just processing pollen but also include interdepartmental and institutional collaborations, as well as supporting student research development. Dr Lynne Quick is the Head of the Laboratory and Nelson Mandela University's resident palynologist. Dr Quick runs the Palaeolab with Ms Erin Hilmer (Senior Laboratory Technician). Dr Lynne Quick, together with her team have been working tirelessly to ensure that all the goals and visions of the Palaeolab are fulfilled.

Dr Quick and Ms Hilmer started operating the lab in 2019 and immediately after that the Covid 19 pandemic hit. The company has managed to keep momentum despite all the obstacles that the pandemic brought, 2022 has been their best year yet. Presented in this article are some of the highlights from 2022, showing the wonderful work that has come from this project.



Learner and Student Development

One of the goals of the Palaeolab is student research development. This includes introducing students and high school learners to the world of palaeosciences, allowing them to broaden their horizons and gain experience through their research. The lab managed to achieve this goal by opening its doors earlier this year to Pearson High School learners that are interested in pursuing a career in palaeoscience. The learner visit was aimed at educating learners about careers in the field. It also introduced them to laboratory processing methods and exposed them to a mini modern pollen trap field trip at Nelson Mandela University's nature reserve. Besides learner visits, the Palaeolab is committed to inspiring its students to excel in their research and expose themselves to opportunities outside the lab. An honours student from the Palaeolab, Marishka Govender, was selected to attend the International Young Scientist Summer School in Germany.

To highlight the impact the Palaeolab has had on students, this is what some of them had to say about their experience this year:

"When I walked into the Palaeoecology Laboratory of the African Centre for Coastal Palaeosciences I felt that the lab represented

significant potential for the university's palaeoscience research capacity. In a short period of time, since it was established in 2018 it has dedicated itself to conducting quality research and I am excited to be part of its plan to expand its research activities in the next few years through my postdoctoral work." Bongekile Zwane, a postdoctoral researcher at Nelson Mandela University.

"During my week at Nelson Mandela University, I was able to process over 700 sediment samples."

"Many thanks to Lynne, Erin, and the Palaeolab students at Nelson Mandela University for such a warm welcome and a successful week in the lab! During my week at Nelson Mandela University, I was able to process over 700 sediment samples. This would not have been possible without the lab generously sharing space with me and permitting me to get things dirty. Lynne and Erin were so thoughtful and made sure that I had anything I needed to finish everything in time and to get the samples packed up for shipment. They've arrived safe and sound in Utah, and I can't wait to start analysing them and building additional collaborations with the Nelson Mandela University Palaeolab. Thanks again for a wonderful week, and I hope that I'm fortunate enough to visit again!" Stella Mosher, a PhD student being co-supervised by Dr Quick from the University of Utah.

Collaborations and current research

Since its establishment, the Palaeolab has managed to collaborate with multiple institutions. It is associated with the African Centre of Coastal Palaeoscience, the South African National Research Foundation African Origins platform, and the Nelson Mandela University Trust.

The laboratory's current research focuses on

reconstructing the palaeoenvironments of the southern Cape using various proxies and research on modern pollen calibrations. One of the ongoing projects is research on reconstructing palaeoclimates using Hyrax middens at the Klein Karoo in conjunction with Human Origins Research at Boomplaas Cave to get a full scope of the palaeoenvironment and human interactions of the Late Pleistocene and Holocene.

In May 2022, students (Boitumelo Langa, Luke Nel, Asithandile Ntsondwa, Marishka Govender, and Erin Hilmer) were invited to join the Hyrax midden field trip led by Prof. Brian Chase. The field trip was aimed at identifying areas where middens can be extracted. Students also learnt how to spot middens at a distance and what the larger scope of the project entailed. Furthermore, a master student, Asithandile Ntsondwa, was selected to join the Human Origins Migration and Evolution Research (HOMER) first 5-week field season in August 2022 led by Dr Justin Pargeter. The HOMER project at Boomplaas is aimed at training students and researchers in archaeological field methods.



Broadening Horizons

Dr Quick's passion for palaeoscience and student development has been very clear this year. She collaborated with the University of Leon's Palynology laboratory led by Dr Saul Manzano to host the first Quaternary Palynology International Meeting in Leon, Spain. Following the Spain workshop, the Palaeolab students attended the Southern African Quaternary Research Conference in St Lucia, South Africa. The conference gave the students an opportunity to present their first conference posters and get to engage with researchers with years of experience in the palaeosciences field.

To wrap up the year Dr Quick and a postdoctoral researcher, Dr Bongekile Zwane, presented at

Nobel in Africa: Symposia Series

Nelson Mandela University hosted some of the Nobel in Africa Symposia Series outreach activities on Friday, 21 October 2022. We are thrilled that this came at the time when our Faculty will be hosting the 7th Biennial African School of Physics (ASP2022) and the African Conference on Physics (ACP2022).

Nobel in Africa is a Stellenbosch Institute for Advanced Study (STIAS) Initiative in partnership with Stellenbosch University, under the auspices of the Nobel Foundation and the Royal Swedish Academy of Sciences with funding from the Knut & Alice Wallenberg Foundation.

The Symposia provides a unique opportunity to support and showcase advanced research and scholarship on the African continent, and to promote research excellence and collaborative scholarship in Africa in conversation with the rest of the world. The aim is to provide an international forum to promote the sharing of innovative, high-level scholarship and to demonstrate the importance of scientific research for the future of the continent and the world.

The Nobel Foundation's symposium activities were initiated in 1965. Starting from 2019 the responsibility for funding and administering the Symposia was licenced out to the Royal Swedish Academy of Sciences (KVA) and the Norwegian Nobel Committee. The symposia are devoted to areas of science where breakthroughs are occurring, or topics of primary cultural or social significance.

As part of each Nobel Symposium at STIAS an extended outreach programme to various South African Universities will be organized to bring Symposium participants to those campuses for public talks and engagements. The first Nobel Symposium at STIAS took place from 24 – 28 October 2022 in the area of Physics.

The events will all strengthen the celebrations of the International Year of Basic Sciences for Sustainable Development (IYBSSD) as well as the centenary celebrations of the International Union of Pure and Applied Physics (IUPAP).

South Africa is one of the thirteen founding members of the IUPAP which has now over 60 country member states. Nelson Mandela University's Faculty of Science has a special focus on Africa through its strategic intent of lifelong engagement & partnerships with and training & nurturing of scholars and intellectual leaders on the continent.

Motivational Talk

Dr Thiffhelimbilu Daphney Bucher (CPUT) gave an introductory motivational talk (in person) with the title Rise and Take your Position that lead up to a virtual public lecture presentation by Prof. Neil Turok (University of Edinburgh and Honorary Doctor of Nelson Mandela University) with the title Universe.

“Education is the husband who will never leave you.”

Nuclear Physicist Daphney Bucher said that her mother told her: “Education is the husband who will never leave you.” She reiterated this statement during a moving talk about how the African Institute for Mathematical Sciences

(AIMS) helped her gain her PhD in Nuclear Physics. This was the same standing ovation talk – about one South African woman's determination to become educated – that motivated Google to donate \$1 million to AIMS.

Virtual Talk

“Ten, 20 years from now you are going to see young Africans in every field of science doing pioneering work; there is no question about it. They are more motivated than other young people from other continents,” These are the words Prof. Neil Turok, who was recently appointed as the Higgs Chair of Theoretical Physics at the University of Edinburgh, at the Francis Allotey Public Lecture organised by the African Institute for Mathematical Sciences (AIMS), Ghana at the Ghana Academy of Arts and Sciences in Accra.

In 2003, Turok founded the African Institute for Mathematical Sciences (AIMS) in Muizenberg, a postgraduate educational centre supporting the development of mathematics and science across the African continent.

After the motivational talk Prof Turok had a virtual talk via Zoom to the audience online, whilst also have a live audience at CPUT.

Overall, the event was a success and we had a significant number of people in the audience, including lecturers, students, educators, learners and the general public.

We would like to thank STIAS and NITheCS for generously supporting us in hosting the Nobel in Africa Symposia Series outreach activities.

Thank you to the faculty of science staff and students who attended the public lecture. We appreciate your continuous support.

NOBEL SYMPOSIA SERIES

**Rise and Take
Your Position**

Thiffhelimbilu Daphney Bucher

**Universe
Neil Turok**



Geosciences department wins 100k

Written by: Sisipho Dlakiya

Our students in the Geoscience department have won the inaugural student entrepreneurship competition and a R100 000 to go with it. The competition was about pitching a business idea for funding. This was done with the team from Physics and the Centre for Broadband Communication with Prof Tim Gibbon.

“We will use the funding to build a device that will work on the field”

Sisipho Dlakiya (MSc Geology student), Francois Swanepoel (BSc Hons in Geology student) and Shumane Vela, (MSc Physics student), presented an optical fibre device which can be used as a monitoring and warning tool for the mining and civil engineering sector, in case of any geological disaster.

“We will use the funding to build a device that will work on the field. We’ve learnt a lot from this competition, starting from the workshop conducted by FarSight Coaching which equipped us with the necessary skills to be able to present



Geosciences department students with their big prize

a business idea. We encourage other students to take opportunities like these as they open doors to success.” said Sisipho Dlakiya

“It was a tough competition, but with the help of my co-supervisor Dr James Jena our team triumphant. I would like to give my sincere and deepest gratitude to Professor Tim Gibbon and our colleagues in the Centre of Broadband Telecommunications (CBC) and my supervisor, Dr Gaathier Mahed, for their continuous support and guidance throughout this journey.” – Sisipho Dlakiya.

Sci-SA Career Expo

Written by: Mhlahli Bukula

The Science Students' Association (Sci-SA) hosted a science career exhibition on the 29th of September aimed at informing students of the various career options available in their respective science departments.

It was discovered that students in the science faculty, final years in particular, had no idea where and how to go about looking for job opportunities in the industry; this is how the idea to host this exposition came about.

Lassec, BASF, S4, Sustainable Seas Trust, Groundwater Division SA and representatives from all the science faculty departments came through to support the event and share the highly sought information with students.

In addition, departments within the faculty of science also had exhibitions stalls to provide students with more insight to the various departments within the Faculty of Science.

A big thank you to all the above-mentioned parties, and every student who attended the event, for playing a part in making it a success.



Science students with their Groundwater Division pamphlets

#2023AY **FACULTY**
WEBINAR

2022 Getting to know the Faculty of
Science

Science

Communication and Marketing (Student Recruitment)

Faculty of Science Webinar

Nelson Mandela University's Communications and Marketing organised Faculty webinars, whereby they invited all 2023 prospective students and their parents to our Faculty of Science webinar. The webinar premiered on 10 November 2022 on the Nelson Mandela University YouTube channel.

The purpose of the webinars are to prepare accepted and provisionally accepted students for the 2023 academic year and for these students to gain more insight on important matters such as science faculty campuses, facilities, service departments, student housing, financial aid, sport and so much more.

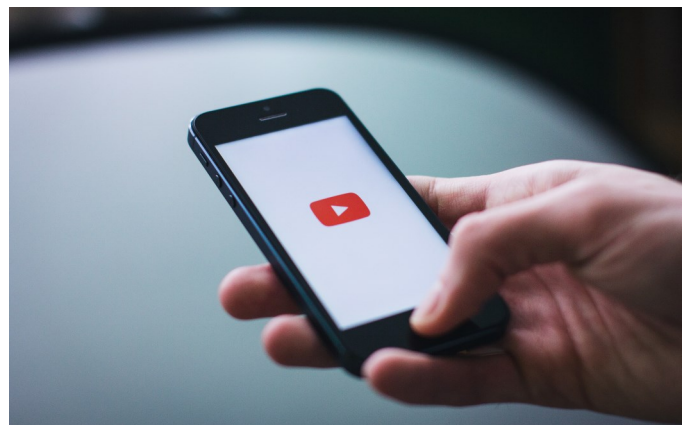
We had a panel of staff as moderators on the YouTube channel. This panel was made up of the Faculty of Science Deanery and Directors of Schools, administration staff, and student access and enrolment staff and staff from George Campus to answer questions in the chat.

The webinar and the questions and answers in the chat will remain on the Nelson Mandela University YouTube channel so that students who might have missed the premiere can access it at a later stage.

On the night the webinar premiered we had 235 views, but to this date our webinar reached 1.2k views on the Nelson Mandela University YouTube channel. This is testament to the accessibility and efficiency of the platform,

YouTube, for our tech-savvy students.

We would like to thank Communication and Marketing for their guidance throughout the preparations for the Faculty of Science Webinar and to all the Faculty of Science staff and students and all other staff for their assistance and support during the premiere of the webinar.



Change the World

Madibaz Physics Chess Tournament

The Physics Department proudly sponsored the "2022 MADIBAZ PHYSICS CHESS TOURNAMENT", held 7-8 October 2022. The event drew over 80 competitors, fiercely battling over the board. Congratulations to Gerald Wagner, winner of the highest rating bracket, and everyone who participated. Chess resonates strongly with STEM through problem-solving, creativity, and strategic thinking.



2022 Madibaz Chess tournament participants

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science.marketing@mandela.ac.za / 041 504 4853