
NASSP

NATIONAL ASTROPHYSICS
AND SPACE SCIENCE
PROGRAMME

NASSP Newsletter 2025

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NASSPie Dr Rosalind Skelton Appointed MD of NRF-SAAO

Copied from <https://www.nrf.ac.za/dr-rosalind-skelton-appointed-md-of-nrf-saao/>

Dr Rosalind Skelton has been appointed the new Managing Director of the South African Astronomical Observatory (NRF-SAAO). She has held the position of Acting Managing Director of the facility since 2024. Dr Skelton



Figure 1: Dr Ros Skelton

completed her Honours degree in Theoretical Physics at the University of Cape Town where she also completed her Master's degree through the National Astrophysics and Space Science Programme (NASSP). She then moved to the University of Heidelberg and the Max Planck Institute for Astronomy in Germany where she completed her PhD in

Galaxy Formation and Evolution. After a stint as a postdoctoral Fellow at Yale University in the USA, she returned to South Africa in 2013 to take up a postdoctoral Fellowship at NRF-SAAO under the NRF's Professional Development Programme.

She joined the Southern African Large Telescope (SALT) Astronomy Operations team at NRF-SAAO in 2016 and was appointed as facility's Head of Research in 2023. Dr Skelton has been closely associated with NASSP for many years, as a supervisor, lecturer, as NRF-SAAO's NASSP representative, and as the Chair of the NASSP Partnership from 2021 – 2024.

She is an Honorary Research Associate of the University of Cape Town and has supervised a number of postgraduate students. Her group investigates the processes and interactions affecting galaxies in different environments through multiwavelength observations. Her work has led to more than 70 co-authored publications. She is also involved in a number of international research collaborations, including the 4MOST Hemisphere Survey, where she is the science policy lead; as well as multiple large projects involving South Africa's flagship telescopes, SALT and the MeerKAT radio telescope.

As she takes the helm of the SAAO, Dr Skelton embodies the very best of the programme she once attended. Her leadership promises an exciting era for South African astronomy. All NASSP wishes to congratulate you and you are indeed an example for future NASSPie's.

UCT students attend the High Energy Astrophysics in Southern Africa workshop

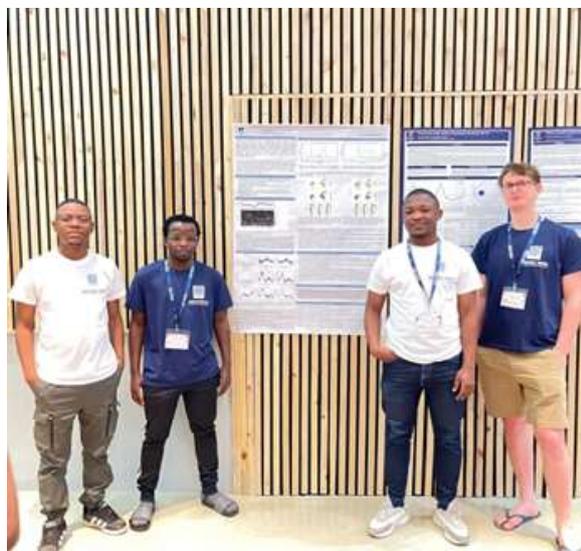


Figure 2: UCT students attend the HEASA workshop at Glenburn Lodge and Spa in Centurion. From left to right: Mr Victor Moloji (left), Mr Andries Mathiba (middle), Mr Lutho Booi (middle) and Mr Emil Meintjies (right).

Students from the University of Cape Town attended the HEASA workshop, which was hosted by the University of Johannesburg at Glenburn Lodge and Spa in Centurion from 16 to 20 September 2025. The HEASA workshop is an annual event that serves as a platform for high-energy astrophysicists in Southern Africa (and the international community) to share their research findings.

NWU NASSP students attend two-week long coding school

Full article available here : <https://news.nwu.ac.za/two-week-long-coding-school-explores-data-science-and-computational-thinking>

From 27 January to 7 February, registered postgraduate students from the North-West University (NWU) including NASSP students, engaged themselves in the fields of data science and computational thinking. In a world of data-driven decision-making, they acquired vital skills that will influence their futures.



Figure 3: NWU students attending coding school. Photo credit : News@NWU

Now in its 15th year, the Centre for High Performance Computing (CHPC) Coding Summer School – held in collaboration with the National Institute for Theoretical and Computational Sciences (NITheCS) – focused on “Foundations of Data Science and Computational Thinking”. This initiative aimed at training researchers in the fundamentals of scientific computing and data science.

The school, which was accommodated across all three campuses of the NWU and at various universities and research sites across the country, offered a comprehensive programme comprising daily lectures, interactive code-along tutorials and hands-on assignments. Furthermore, esteemed professionals from diverse science, technology, engineering and mathematics (STEM) disciplines delivered insightful presentations. At the conclusion of the programme, qualified participants were awarded certificates of completion.

Dr Daniel Moeketsi, senior lecturer at the School of Physics and Centre for Space Research at the NWU, underscored the significance of this initiative. He said, “This summer school not only empowers students to effectively utilise high-performance computing resources but also enables them to tackle complex data challenges in their respective fields.”

The curriculum was structured to provide an in-depth learning experience. The first week focused on essential topics such as data science with Pandas, Python best practices, workflow management, and extract, transform and load (ETL) processes. In addition, students studied exploratory data analysis (EDA)

and the fundamentals of Bash scripting. Building on this foundation, the second week saw the students exploring machine learning, artificial intelligence, probability theory, statistics and computational thinking.

Kgaugelo Ledwaba, a NASSP BSc Honours student in Physics, highlighted the impact of the programme: “The skills, techniques and insights gained will enhance my research. I particularly enjoyed the code-along sessions and team-building exercises, which not only extended my knowledge but also facilitated meaningful engagements with fellow participants.”

2026 UCT NASSP Honours students



Figure 4: NASSP students attending a lecture about the night sky inside the Iziko digital dome.

The new UCT NASSP Honours 2026 students attended the annual NASSP Summer School co-organised by Mr Chad Leukes, Mr Moses Mlangeni and Mr Victor Moloji. The NASSP Summer school runs during the UCT zero-week in preparation for the new academic year. The new students partake in various activities including visiting astronomical sites such as the South African Astronomical Observatory (SAAO) in Cape Town and the Iziko Planetarium (City center). See Figure 4.

The cohort was formally welcomed at a lunch held at UCT, providing an opportunity for students and staff to connect at the start of the academic year. The session was led by Prof Saalih. During the lunch, students engaged in conversations with members of the teaching team and had the chance to meet the full



Figure 5: Dr Gary Tupper (left) and Prof Saalih Al-lie (right) leading the NASSP Honours 2026 welcoming lunch.



Figure 6: Dr Zwido Khangale engaging in conversation with students during the welcoming lunch.

complement of lecturers and tutors across the programme’s modules. See Figures 5 and 6. The event created a warm and collegial atmosphere, marking the beginning of the students journey within the NASSP community. In addition to this, the students also participate in team building activities such as bowling. See Figure 7.

Students in the UCT NASSP Honours 2026 cohort also took part in an introductory ses-



Figure 7: NASSP Honours students participating in bowling at Stadium on Main in Claremont.



Figure 8: NASSP students attending the introduction to Linux Operating system lecture during the Summer School.

sion on the Linux operating system, setting up and familiarising themselves with their new laptops for the academic year ahead. See Figure 8. The session was facilitated by Mr Siphelo Funani (IT Manager at Astro Department) and Mr Mayhew Steyn (Computational Astrophysics Lecturer), whose guidance ensured a smooth transition into the computing environment that will support the students research and coursework throughout the programme.

NWU NASSP students attend South African Institute of Physics (SAIP) conference



Figure 9: NASSP students and staff from the North-West University attend the 2025 SAIP conference at the University of the Witwatersrand (Wits) in Johannesburg

NWU NASSP students and staff attended the 69th annual conference of the South African Institute of Physics (SAIP) conference at the University of the Witwatersrand (Wits) in Johannesburg.

The South African Institute of Physics (SAIP) Conference is an annual gathering that serves as the main platform for physicists in South Africa (and often from the broader African and international community) to:

- Share research findings across all fields of physics.
- Network and collaborate across institutions and disciplines.
- Showcase student and early-career researcher work.
- Discuss physics education and outreach in South Africa.
- Support transformation and inclusion within the physics community.

It was another stellar performance from the NWU NASSP students with the following prizes awarded to current or former NASSP students:



Figure 12: Prof Amare Abebe. Photo credit : News@NWU

enhancing astronomy education and outreach across Africa.

Prof Abebe also emphasises the importance of building stronger ties between AfAS, governments, industries and international organisations to foster interdisciplinary research, industry partnerships and policy support.

“Out of the more than 50 countries in Africa, no more than 20 of them have any meaningful astronomy programme. There is a lot of room for growth, and there needs to be enhanced public awareness of astronomy across Africa, particularly in underserved regions.”

He identifies outreach programmes, educational initiatives and integration into school curricula as key to increasing interest in astronomy. “Improving data-sharing infrastructure across African nations, possibly facilitating better collaboration and access to global astronomical databases, will lead to enhanced collaboration,” he says.

Prof Abebe mentions the Square Kilometre Array (SKA) project, led by South Africa, as an example of infrastructure that supports collaboration between African countries and scientists.

“One of AfAS’s objectives is to bring leading African and international scientists together during its different annual activities to foster collaboration and create professional networking opportunities for its emerging astronomers and students.”

He stresses the need to use traditional media and digital platforms to raise awareness.

He says active outreach and education campaigns, especially in astronomically speaking underdeveloped regions, as well as formal workshops and conferences, are a great way to introduce astronomy to future astronomers.



Figure 13: Staff from the Centre for Space Research at the North-West University (NWU) and NASSP students participate in the NWU open day to encourage learners to consider Cosmology, Astronomy, Astrophysics and Space Science as a career.



Figure 14: Dr Ruhann Steyn and Ms Calmay Lee (NASSPie) showing learners at the NWU open day how a solar telescope operates.

NWU NASSP students participate in NWU open day

The North-West University’s Physics Open Day 2025 was a vibrant and inspiring showcase of science, with NASSP proudly represented among a diverse range of partners. Held on the Potchefstroom campus, the event brought together learners, educators, and researchers in a day filled with curiosity, discovery, and career inspiration. The NWU Physics



Figure 15: NASSP merchandise which was distributed to school learners.

stall buzzed with activity throughout the day. The solar telescope tours and virtual reality experience of the International Space Station (ISS) proved especially popular, with all time slots booked and additional sessions added to meet demand. The event served not only as a public engagement opportunity but also as a meaningful platform for highlighting career pathways in physics - many of which are grounded in the research taking place at NWU's Potchefstroom and Mahikeng campuses.

Students engaged in fruitful discussions about careers in astrophysics, space science, nuclear physics, and materials science. Post-graduate students and researchers offered insight into their work and the journey that led them there - sparking enthusiasm among high school learners and encouraging deeper interest in physics studies beyond matric. Behind the scenes, a dedicated team of staff and student volunteers ensured the day's success - coordinating logistics, managing outreach, assisting with branding, and capturing the event

through photography and videography. Their commitment and teamwork brought the vision of the event to life.

The presence of key national partners enriched the experience and highlighted the many opportunities available within South Africa's physics landscape. NASSP provided information about postgraduate training in astrophysics and space science, while HESS showcased opportunities in high-energy astrophysics and international research collaborations. NMISA illustrated the role of precision measurement in industry and research, and SANSa introduced learners to careers in satellite technology, space weather, and Earth observation. WIPISA emphasized mentorship and gender equity in physics, and SAIP not only promoted physics pathways but also generously supported Grade 12 learners with exam preparation workbooks, helping them feel better prepared for their final school exams. SAAO sparked interest in observational astronomy and the development of astronomical instruments.

The day closed with tired feet and happy hearts—a testament to the energy, collaboration, and shared passion for science among all involved. To revisit the highlights, a short event vlog and a full gallery of photos are available. For access please contact Prof. Lynndle Square at the Centre for Space Research.

UKZN NASSP 2025 Tour to the Western Cape

The NASSP-UKZN yearly tour of scientific sites in and around Cape Town was held this year from July 14–18. Dr. Mthokozisi Mdlalose, a UKZN astronomer and lecturer in astrophysics and observational techniques, guided the NASSP Honors students.

The journey began on Tuesday morning at the South African Astronomical Observatory (SAAO), where they were given an astronomy presentation and a tour of the McClean telescope and dome, as well as the scientific engineering laboratory.

After that, the group went to UCT to meet other NASSP students for lunch, where they were entertained by the Department of Astronomy. After seeing the department's telescopes and Visual Lab, they took a tour of the



Figure 16: UKZN Honours students 2025 tour to SAAO



Figure 17: KZN students 2025 presentation at SAAO

campus, stopping along the way to take in the breathtaking UCT architecture and the expansive vistas of Cape Town.

A day excursion to the South African National Space Agency's (SANSA) space science center in Hermanus was planned for Wednesday. They enjoyed a tour of the facilities and a lecture by Professor Mike Kosch.

The third and last day of the tour, Thursday, was dedicated to a team-building excursion to the Cape Peninsula and the Iziko Planetarium.

The trip was successful, engaging, educational, and enjoyable. We at UKZN are grateful to all who made it possible, including our Finance Officers, Ms Thandeka Maphumulo and Mr Mpho Sehoto, Dr Mthokozisi Mdlalose as the leader, and all our hosts in the Western Cape.



Figure 18: UKZN Honours students 2025 tour to SANSA



Figure 19: UKZN Honours students 2025 Western Cape tour

2026 NASSP Winter School

From the NASSP Winterschool report (Compiled by Drs Khangale and Sefako)

The annual NASSP-SAAO Winter School was held at the South African Astronomical Observatory (SAAO) in Cape Town from 23 June to 4 July 2025. This marked the third in-person Winter School following the COVID-19 pandemic, which disrupted activities from March 2020. The NASSP-SAAO Winter School plays a vital role in providing introductory astronomy education to third-year students from universities that do not offer astronomy or re-

lated programmes. Additionally, it serves as an important recruitment tool to attract Black students with potential into the National Astrophysics and Space Science Programme (NASSP). This strategy has been effective, contributing to a significant increase in Black South African students joining NASSP since the inception of the programme.

For 2025, 20 students (12 women and 8 men) were selected from more than 120 applications, maintaining the same intake as the previous two years (2023 and 2024). It is the first time where the number of woman (60%) applicants exceeded the men (40%) in the entire history of the winter school. In addition, this year saw an increase in the number of applicants from 103 in 2024 to 126 in 2025. The students represented seven universities: North-West University (NWU, Mahikeng Campus), Sol Plaatje University (SPU), University of the Free State (UFS, Qwa Qwa Campus), University of Limpopo (UL), University of Venda (UniVen), University of Zululand (UniZulu), and Walter Sisulu University (WSU). There were no applications from universities that already offer astronomy programme like the University of the Western Cape (UWC), University of KwaZulu-Natal (UKZN), etc., who applied in the past and were not considered for the winter school. Lectures took place from 09:30 to 13:00 daily, delivered by astronomers from local institutions such as UCT, SAAO, and other NASSP consortium members. These lectures introduced students to key topics in astronomy, followed by interactive discussions. Students were encouraged to engage with speakers beyond the sessions for further discussions. Additionally, postgraduate students, including some tutors, presented topics such as an introduction to LaTeX, Python computing, Machine learning, and Linux platforms, amongst other topics. In addition, this year's cohort was invited to attend the LSST Vera C. Rubin Observatory First Light event, which was held at Iziko Planetarium on 23 June 2025.

Afternoon sessions (14:00-18:00) were dedicated to student projects and tutorials, guided by tutors. Despite financial constraints limiting the number of full-time tutors to five, faculty members from SAAO and UCT provided additional support. Projects included:



Figure 20: NASSP 2025 Winter School

- Imaging observations of variable stars using data from Mookodi on Lesedi, with students analyzing data, extracting light curves, and determining stellar periods using AstrolmageJ.
- Spectral classification of stars using SDSS spectra to classify unknown stars.
- Galaxy Zoo Tutorial: an online citizen science project for classifying images of galaxies to help astronomers understand galaxy evolution

Feedback from university department heads has been highly positive. Many have observed that students return from the Winter School more motivated, engaged, and academically focused. As of 15 September 2025, at least nine of the twenty participants have already applied to join the NASSP programme in 2026. The Winter School also continues to serve as an effective pipeline for identifying and nurturing talent, with many participants progressing into NASSP postgraduate



Figure 21: NASSP 2025 Winter School



Figure 22: NASSP 2025 Winter School

studies and subsequently pursuing careers as researchers, academics, and data scientists. It remains a vital initiative for human capacity development in South African astronomy, and its continuation is strongly warranted.

Capturing Solar Phenomena in the Southern Hemisphere: From Research Training to Real-Time Observation

In May 2024, dazzling sheets of green and red light danced across the southern hemisphere—a mesmerizing display sparked by one of the most intense solar storms in recent memory. With support from the NASSP North-West University (NWU) node, researchers at NWU’s Centre for Space Research (CSR) captured high-resolution imagery of Active Region 3664, the volatile sunspot group responsible for the event.

Using the university’s solar telescope in Potchefstroom, heliophysicist Dr. Ruhann Steyn and former NASSP master’s student, now PhD candidate, Ms. Calmay Lee recorded real-time data as the sunspot flared. Their observations contributed valuable insights into the solar activity that triggered rare auroral displays far beyond the polar regions. “It was exhilarating to witness Active Region 3664 flare up in real time,” said Dr. Steyn. “Capturing this data as the auroras unfolded across southern skies was a reminder of how deeply connected Earth is to the rhythms of our star.” What began as a simple demonstration on NWU’s Open Day soon evolved into a rare scientific opportunity. “Although we were initially showing the telescope to prospective students and their parents, we noticed an exceptionally large and active sunspot,” said Dr. Steyn. In the days that followed, Ms Lee continued to monitor and document the region, which eventually grew to over 200,000 km across, 15 times the diameter of Earth. The data they collected not only documented a historic solar flare but contributed to the global understanding of how such solar activity translates into geomagnetic storms. These storms can be both beautiful and dangerous: while they paint the sky with auroras, they also threaten satellites, power grids, and communication infrastructure.

Dr Steyn’s earlier research focused on heliospheric magnetic fields, the transport of solar energetic particles through the heliosphere, and space weather prediction. His current work is centred on solar physics, with particular emphasis on solar features observed in the photosphere (the visible surface of the Sun) and the chromosphere (the lower atmo-

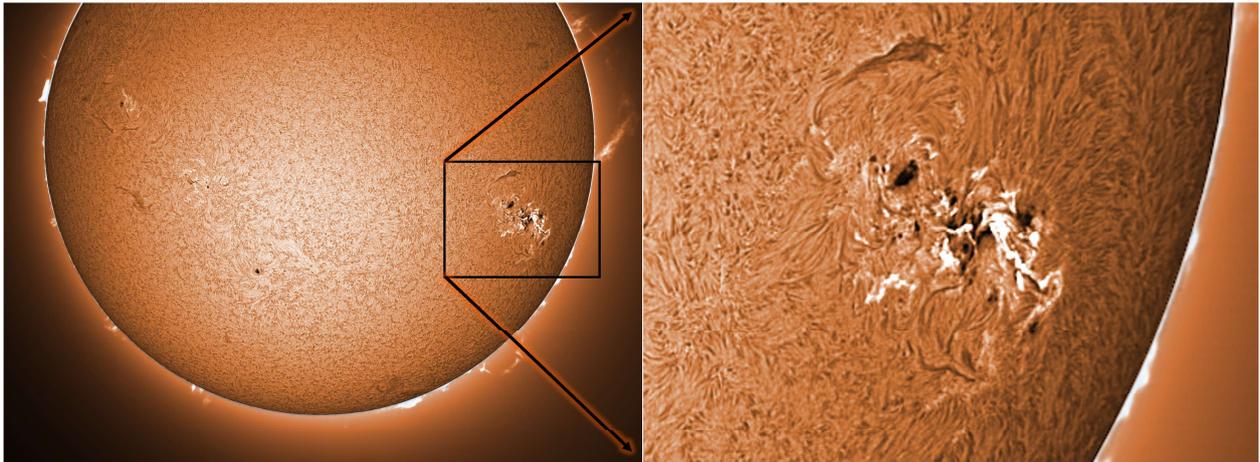


Figure 23: Active Region 3664 captured by the hydrogen-alpha solar telescope at the Potchefstroom campus of the NWU on 11 May 2024. Observer: NASSPie : Calmay Lee

sphere of the Sun). He collaborates closely with researchers at Northumbria University in the United Kingdom as part of international efforts to advance solar physics in South Africa. During the summer take-over period of 2014-2015, Dr Steyn travelled to the SANAE4 base in Antarctica for magnetometer installations with SANS and was named a Mail and Guardian 200 Young South Africans recipient in 2015. Later that same year, he supervised students during a Mission to Mars programme at the United Space School hosted by the University of Houston–Clear Lake in the United States. He currently supervises NASSP master's student Mr Zulu, who is working on solar physics as part of the growing research group at NWU.

The NWU solar telescope has developed from a 2017 proof-of-concept into a state-of-the-art observatory housed in a custom-built dome, thanks in part to contributions from Dr Steyn and the Instrument Makers at the NWU. It plays a key role in both research and NASSP student training. For Dr Steyn, the mission goes beyond data collection. He's an advocate for public science communication, having hosted weekly national radio talks and regularly appearing in the media to educate the public about space weather without sensationalism. Looking forward, Dr Steyn hopes to establish a dedicated solar physics research group at NWU, with NASSP students at its core. This group will continue to monitor solar activity, produce real-time imagery, and con-

tribute to international space weather collaboration. With a growing focus on solar physics, the work emerging from NWU and NASSP is contributing valuable data to the global space weather community - advancing our understanding of space weather, and strengthening the continent's role in space science.

