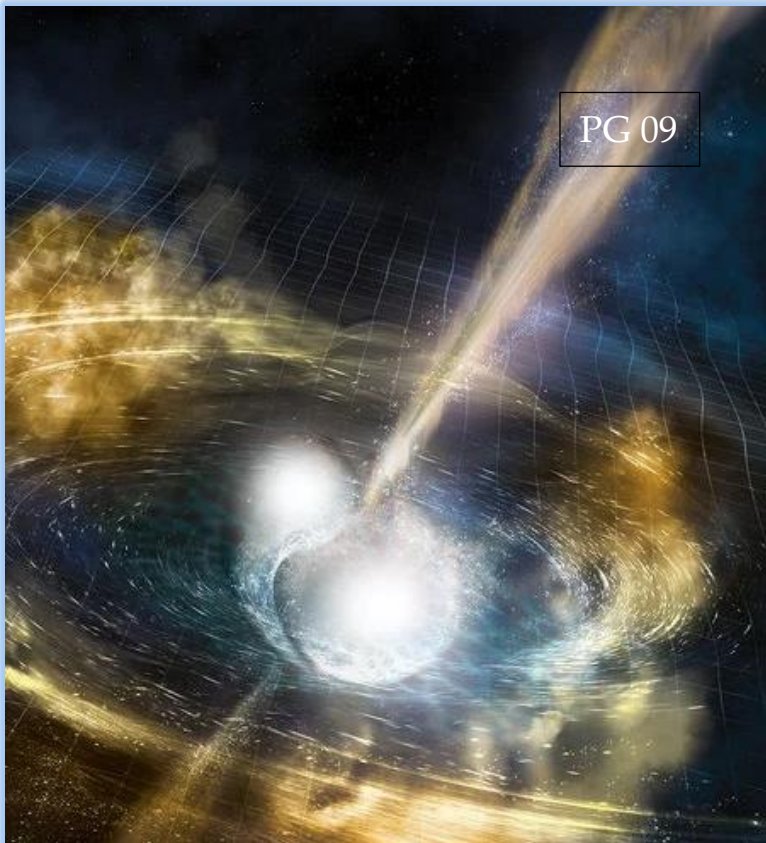


Physics Comment – December 2023

Published by the South African Institute of Physics

KEEPING SOUTH AFRICA ON:
PHOTONIC MATERIALS
PG 13

A RENOWNED PROFESSOR
IS HONoured
PG 14



Physics Comment (PC) is a magazine published by the South African Institute of Physics (SAIP) and appears quarterly. The vision of the SAIP is to be the voice of Physics in South Africa.



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President's Note

As 2023 draws to a close, many of you are probably, like me, looking forward to a holiday break. The pandemic lockdown disruptions are becoming a memory, although the effect it had on the country's school learners will still be felt for several years to come.

One of the SAIP's projects, the Teacher Development Project, addresses the need to equip teachers with the necessary tools and skills to provide learners with basic science knowledge and understanding. This project has a particularly good track record, and it is serving as the foundation for expanding this project to younger cohorts of learners. The report on the SAIP Science Forum 2023 session on this issue gives more information on this important initiative.

This issue also contributes to the activities of WiPiSA, another of the SAIP's long-standing and successful projects.

The 67th Annual Conference of the SAIP (SAIP2023) took place in person again for the first time since 2019, being hosted by the University of Zululand at the Richards Bay campus from 3 to 7 July 2023. The conference was highly successful, with especially favourable comments from students attending it for the first time. This issue features a report on this conference, as well as the 9th South African Conference on Photonic Materials which also took place in person. Please make a note of the dates of SAIP2024, which will be hosted by Rhodes University.

This issue of PC magazine is the first issue under the Editorship of Dr Edwin Mapasha. I would like to express my gratitude to him and his team for their efforts in compiling this issue; I hope you enjoy the other articles featured in this magazine issue.

I wish everyone a restful and festive season!

With best regards
Rudolph Erasmus
President: SAIP

Council Members (2023-2025)

A new SAIP council took office from July 2023 to July 2025. The incoming President, Prof Rudolph Erasmus, received the ceremonial President's staff from the outgoing President, Prof Makaiko Chithambo, at the SAIP2023 gala dinner.



COUNCIL EXECUTIVE

TITLE	NAME	POSITION
Prof	Rudolph Erasmus (WITS)	President
Prof	Regina Maphanga (CSIR)	Honorary Secretary
Prof	Ernest Van Dyk (NMU)	Honorary Treasurer
Prof	Makaiko Chithambo (RU)	Past- President & International Cooperation
Prof	Eric Maluta (UNIVEN)	President-Elect & Audit and Risk Chairperson

OTHER COUNCIL MEMBERS

TITLE	NAME	POSITION
Mr	Cade Peters (WITS)	Student Representative
Dr	Bongani Maqabuka (UJ)	Industrial Liaison
Prof	Alan Cornell (UJ)	Divisions and Forum Representative
Dr	Rosina Modiba (CSIR)	Outreach and Public Understanding of Physics
Prof	Deepak Kar (WITS)	Awards and Standards Committee
Dr	Edwin Mapasha (UP)	Physics Comment magazine
Dr	Trisha Salagaram (UCT)	Physics Education
Prof	Du Toit Strauss (NWU)	Conferences & Astronomy Liaison
Dr	Brian Masara (SAIP)	Chief Executive Officer (ex officio Council member)

Source: SAIP website

Articles

South African Physics Olympiad (SAPhO) results

On Tuesday 3 October 2023, the South African Institute of Physics (SAIP) announced the South African Physics Olympiad (SAPhO) results to the media, the schools involved, and the learners who excelled in the SAPhO examination.

The winner of the 2023 SA Physics Olympiad, Mr. Alexander Warrington, received his gold certificate from Dr Trisha Salagaram of the SA Institute of Physics

In a remarkable display of talent and determination, 162 bright minds from selected secondary schools across South Africa recently participated in the SAPhO

2023 exam. This year's event marked a significant milestone, boasting a higher number of participants than the preceding two years. Organized under challenging circumstances, the Olympiad set the stage for these young scientists to showcase their skills, both online and in person, in a groundbreaking hybrid exam format.



Unveiling Latent Talent: The Vision Behind SAPHO

“South Africa, like every other country in the world, has amongst its youth a latent talent that needs to be identified, nurtured, and monitored, to allow them to reach their full potential. There are talent scouts for potential sportsmen and -women, so why not for Mathematics and Sciences? After all our future lies in education and a technologically based economy. Identifying future scientists and engineers is essential and SAPHO is one pathway to success”, says Case Rijdsdijk, SAPHO Convener.

A Triumph Amidst Adversity: SAPHO 2023 Results

Despite the prevailing challenges, the South African Physics Olympiad (SAPHO) 2023 witnessed a remarkable display of brilliance and determination. The results were not just satisfactory; they were awe-inspiring. Among the stellar achievers, Mr. Alexander Warrington, a Grade 12 prodigy from El Shaddai Christian School in the Western Cape, emerged as the shining star, securing the top position in this prestigious competition. His outstanding performance earned him a coveted Gold Certificate, along with a cash prize of R2,500 and the prestigious SAIP SAPHO Medal, which will be presented to him by the South African Institute of Physics.

Alexander's passion for Physics and his relentless pursuit of knowledge were evident to his teacher, Ms. Beth Evers. She commended his unique problem-solving skills and celebrated his achievement, stating, *“Alex is passionate about Physics, and spends much of his free time researching. I am delighted with his achievement.”*

In the second position was Miss Melissa Muller, a dedicated Grade 12 learner from Rhenish Girls' High School in the Western Cape. Melissa's hard work and commitment to excellence earned her the Silver Certificate and a prize of R1,500. Her teacher, Ms. Lana Schreuder, praised Melissa's exceptional critical thinking and problem-solving skills. Melissa herself shared her enthusiasm, saying, *“I really enjoyed writing the Olympiad as I enjoy challenges where you have to think outside of the box.”*

Securing the third place was Mr. Ilan Ben-attar from St Alban's College, Gauteng. Ilan's efforts were rewarded with a Bronze Certificate and a prize of R1,000. Expressing his gratitude, he remarked, *“Thank you for the opportunity; it's great to be rewarded for the time and energy I put into preparing.”* Mrs. Sandra Schwartz, his teacher, extended her thanks to the SAIP for the opportunity to challenge and inspire their learners.



MR. ILAN BEN-ATTAR
3RD PLACE

MS. MELISSA MULLER
2ND PLACE

MR. ALEX WARRINGTON
SAPHO WINNER 2023

SAPHO will award those who scored between 70% and 60% Distinction Certificates for their achievements and those who scored between 59% and 50% will receive Merit Certificates. The remaining learners will receive Participation Certificates to acknowledge their participation in the Olympiad.

SAPHO 2023 Triumph: A Collective Effort Recognized and Celebrated

SAPHO Convener, **Case Rijdsdijk**, expressed gratitude to the Department of Science and Innovation (DSI), the South African Agency for Science and Technology Advancement (SAASTA), and key individuals like Mr. Paul Molefe, Dr. Brian Masara, Ms. Ndanganeni Mahani, and Mr. Tebogo Mokhine for their contributions to SAPHO's

success. SAPHO aims to recognize excellence in Physics among South Africa's youth, encouraging them to pursue the subject at tertiary institutions, and stands as the sole Physics Olympiad registered with ASTEMI Olympiads and Competitions.

The President of the SAIP, Prof Rudolph Erasmus, expresses his sincere gratitude to all the people and organisations enabling the annual running of the SAPHO event. The relevance of the basic sciences to address the intricate and complex challenges of our time continues to be recognised in the recent proclamation of the period 2024 to 2033 as the "International Decade of Sciences for Sustainable Development (IDSSD)" by the United Nations General Assembly. The SAIP will continue to champion the fundamental contributions physics makes through its support of research and education.

Reported by Case Rijsdijk

Physics in Industry hosted by SAIP

The South African Institute of Physics under the Physics for Development, Education and Outreach track hosted the Physics in Industry Day at the SAIP Annual Conference, on Thursday 06 July 2023 at Richards Bay campus, University of Zululand. Various speakers from different institutions were invited to share their work. The invited speakers included **Prof Maaza Malik** from iThemba LABS, **Mr Thabang Jase** (NIPMO), **Prof Pragasen Mudali** (UniZulu), and **Prof Igle Gledhill** (Wits University).

The speaker of the first session was Prof Maaza Malik with his presentation *"Nano-science innovations: On the trapping of cold neutrons in nanoscaled Fabry-Perot resonating cavities & neutron lifetime considerations."* The audience responded well, with several inquiries made about the innovations that Prof. Maaza presented. Mr Jase was the second speaker, from the National Intellectual Property Management Office (NIPMO). He gave a talk on Intellectual Property, Innovation management, and the role of NIPMO in innovation support in South Africa. The topic of how to commercialize prototypes developed in laboratories and how NIPMO assists academics in this regard were the subjects of a contentious conversation. Prof Pragasen Mudali (UniZulu) shared a talk on Innovation and Technology transfer whereas Prof Igle Gledhill (University of Witwatersrand) talked about Physics in Business: Survival in the Jungle. The program was successful and educational, with a large number of students and academics in attendance.



Mr Thabang Jase, NIPMO

Prof Maaza Malik, iThemba Labs

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The goals of the Physics in Industry Day were:

- To inculcate an entrepreneurial culture among physicists
- To develop skills in innovation and commercialization of research among physicists - as you are aware most of the physics of today is the technology of tomorrow.

- ✚ To bridge the innovation chasm - most research ideas are sitting on shelves and not getting to the market.
- ✚ To share experiences with those who have created successful businesses from their research.
- ✚ To create links between industry and physics and promote the role of physics in technology development in South African industries.
- ✚ To provide a platform where industry can present research-related problems they have, and physicists can identify opportunities to work with industry to solve those issues.
- ✚ To present a platform where the physics community can present their research that is ready for commercialization

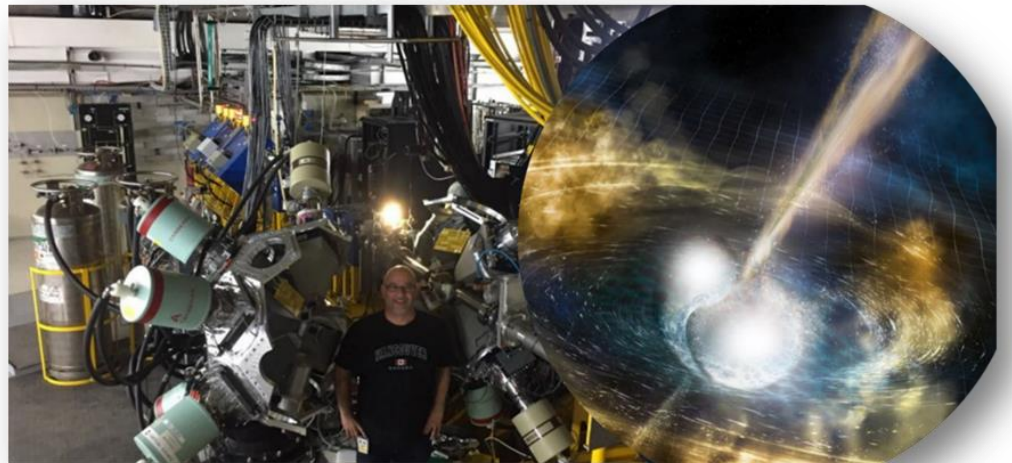
Reported by Ndanganeni Mahani

Understanding the universality of heavy elements: *Groundbreaking research sheds light on scientific mystery.*

Research by scientists in South Africa and India is shedding light on the nuclear processes that lead to the formation of heavy elements after the collision of neutron stars, and why those elements are found in the same relative proportions throughout the universe.

Physicists from the University of the Western Cape in South Africa and India have made strides in solving a long-standing mystery in astrophysics – the 'universality' of heavy element abundances in the universe. Their recent findings, published in the Monthly Notices of the Royal Astronomical Society, explore the rapid neutron capture process (r-process) and its role in the creation of heavy elements, challenging established theories. For decades, scientists have questioned why every star, including the Sun, displays consistent relative amounts of heavy elements. This phenomenon, termed 'universality,' suggests a common source for these elements. The research team, led by Professor Nico Orce, seeks to unravel the mysteries surrounding this cosmic consistency.

Illustration of two merging neutron stars: The rippling space-time grid represents gravitational waves and narrow beams show the bursts of gamma rays shot out just seconds after the gravitational waves.



The study delves into symmetry energy, a measure of the energy cost required to enrich nuclear systems with neutrons. Using high-resolution gamma-ray spectrometers, the researchers identified an unexpected increase in symmetry energy linked to giant dipole resonances (GDR). These GDRs, resulting from collective proton and neutron excitation, play a crucial role in electromagnetic radiation within a nucleus. The heightened symmetry energy has a significant impact on the 'neutron drip line,' where nuclei become unbound. This leads to the breakdown of nuclei into constituent neutrons and protons, revealing new insights into the nucleosynthesis process. The findings challenge existing notions and shed light on the constraints of the r-process.

The researchers propose that the increase in symmetry energy implies a more constrained r-process than previously believed. Rather than a multitude of exotic paths, there seems to be a well-defined route for the r-process. This paradigm shifts challenges established ideas and enhances our understanding of the distribution of heavy elements across the universe. To validate and expand their findings, the team plans to utilize the GAMKA (GAMMA-ray spectrometer for Knowledge in Africa) at South Africa's iThemba Laboratories. This nuclear spectrometer will enable further exploration of the behavior of GDRs at lower temperatures, providing more insight into the r-process. The collaborative effort involved institutions from South Africa and India, showcasing the global nature of astrophysical research.

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In unraveling the cosmic code governing heavy element universality, this groundbreaking research brings us closer to understanding the underlying processes shaping our universe. As scientists continue to explore the r-process and its intricacies, international collaboration and cutting-edge technologies prove essential in decoding the secrets of astrophysics. (Source paper at: <https://doi.org/10.1093/mnras/stad2539>)

Source: NSF/LIGO/Sonoma State University/A. Simonnet.

2023 Past Conferences and Workshops

The 67th Annual Conference of SAIP

The annual conference of the South African Institute of Physics (SAIP) held in 2023 proved to be a stellar event, hosted by the University of Zululand in the picturesque Richards Bay from 3rd to 7th July. The conference, known for its diverse academic sessions and vibrant community engagement, followed its traditional format, highlighting innovative developments in the field.



Winter Schools:

The event kicked off on 3 July with two Winter Schools, delving into the realms of Nanotechnology and Quantum Technology. These sessions set the tone for the subsequent days, providing attendees with in-depth insights into these rapidly evolving fields.

Academic Sessions:

From Tuesday to Friday, the main academic programme unfolded, featuring parallel sessions enriched by two 1-hour plenary lectures by distinguished invited speakers each day. This structure ensured a comprehensive



Delegate presenting to the audience

exploration of various physics disciplines, fostering knowledge exchange and collaboration.

Specialized Sessions:

A noteworthy addition to the conference was the supplementary session on Physics in Industry, held on 6 July 2023. This session provided a platform for bridging the gap between academic research and practical applications. Additionally, a physics teacher development workshop ran parallel to the conference, contributing to the ongoing education and development of physics educators.

SAIP Birthday Celebrations and AGM:

The celebration of the SAIP's success continued with the Birthday Celebrations on 7th July, marking another year of advancements and achievements. The formal proceedings of the conference concluded with the SAIP Annual General Meeting (AGM) on the same afternoon, providing a platform for reflection and planning for the institute's future endeavors.



Delegates attending the SAIP closing ceremony

Conference Banquet and Awards Ceremony:

The crowning glory of SAIP 2023 was undoubtedly the Conference Banquet and Awards Ceremony. This gala event was a momentous occasion, honoring individuals and contributions that stood out during the conference.

Awards:

The event not only serves as a platform for the exchange of cutting-edge research but also provides an opportunity to recognize and celebrate the outstanding achievements of students at various academic levels (Hons, MSc, and PhD) across all seven SAIP divisions. These awards served as a testament to SAIP's commitment to nurturing talent and pushing the boundaries of scientific exploration.



Some winners, pictured with SAIP past president Prof. Makaiko Chithambo and the new SAIP president Prof. Rudolph Erasmus

The 2023 SAIP Silver Jubilee Medal was awarded to Dr. Isaac Nape from the University of the Witwatersrand, Johannesburg, for his outstanding research career in the fields of photonic and quantum computing, where his work is concentrated on exploring higher-dimensional quantum information processing using structured light and harnessing it as a resource for computing. In addition, he also focuses on quantum searching and optimization algorithms as tools for solving inference and inverse problems in physics and other related fields.

Prof. Igle Gledhill was inducted as a Fellow of the SAIP. She specialises in Computational Fluid Dynamics (CFD), especially for transonic flow, prediction of aerodynamic loads on accelerating bodies, and prediction of safe store release from aircraft. She is also interested in the comparison of wind tunnels and other predictive methods, discrete element methods, properties of non-linear optical materials, and modelling of air combat and air warfare. Computational chemistry, molecular dynamics, rational drug design, lattice gases, and cellular automata are a few more of Prof. Gledhill's interests.



Prof. Igle Gledhill

Dr. Isaac Nape

Reported by Rebecca Letsoalo

SAIP 2023 Proceedings

One of the main aims of the South African Institute of Physics (SAIP) is to promote research in Physics. As part of furthering this aim, SAIP constructively promoted the exchange of knowledge among physicists through conferences over many decades. After 56 years of SAIP conferences, it was decided to extend the exchange of knowledge through publications, and the first SAIP Proceedings were formally published in 2011, containing peer-reviewed research papers. The creation of the SAIP Conference Proceedings in 2011 was truly a milestone for the Physics Community in South Africa and was embraced by researchers.

The purpose of the SAIP Proceedings is twofold: firstly, it focuses on disseminating original research and new developments in Physics as well as related fields. Secondly, it aims to provide an opportunity for undergraduate, Masters, and Doctoral students, as well as established researchers, to publish their novel work locally. During 2023 the University of Zululand hosted the annual South African Institute of Physics (SAIP) and some papers from this meeting are collected in the peer-reviewed SAIP 2023 Conference Proceedings. Submissions for the Proceedings of SAIP 2023 were handled by an Editorial Board headed by an Editor-in-Chief and knowledgeable, experienced Associate Editors responsible for submissions in various divisions.

The Editorial Board of the SAIP 2023 Conference Proceedings received 108 manuscripts for consideration by the advertised deadline. After being submitted to a full peer-review process, involving reviewers considered to be experts in each field, a total of 88 of these manuscripts met the relevant criteria and will be published in the

Proceedings. The publication of the SAIP Proceedings is highly dependent on the efficiency of the Associate Editors and the goodwill of reviewers from the scientific community nationally and internationally. The Associate Editors spent much time considering the papers and reviewer reports to ensure that acceptable academic standards were met during the peer-review, for the SAIP 2023 Conference Proceedings to be credible. The majority of the content reviews received were done with great care and diligence and to the highest standards. The meticulous reviewing process has ensured that the Proceedings contain thoroughly peer-reviewed manuscripts of a high professional standard, which report on novel work that has not been published elsewhere. During 2022 and 2023 the Editorial Board started making use of the services of a Technical Editor, who took responsibility for finalizing the complete document. This ensures that the document is of a high technical standard, improving the overall quality of the publication.

SAIP is looking forward to publishing the SAIP 2023 Conference Proceedings before the end of 2023 via the SAIP website (www.saip.org.za) and would like to invite everyone to access the publication once available to see the work done by the researchers that participated in the annual conference. We trust that this will inspire more researchers to submit their publications to the SAIP Proceedings in the future.

Reported by Prof ARE Prinsloo, Editor-in-Chief

9th South African Conference on Photonic Materials

The successful series of bi-annual conferences focusing on photonic materials continued in 2023 four years after the last conference in 2019 due to the COVID restrictions. The 9th SA Conference on Photonic Materials (SACPM 2023) was held in May at the Nombolo Mdluli Conference Centre at the Skukuza Rest Camp in the Kruger National Park. The conference attracted a record number of delegates from many local institutions as well as from abroad, including our plenary and invited speakers from the UK, Germany, France, Italy, Sweden, Norway, and



Conference group photo

India. The conference affords postgraduate students the opportunity to contact and discuss their research with world-leading researchers in their field in an informal setting. Delegates seemed to have been looking forward to being able to meet again face-to-face and the days were spent listening to the oral presentations, discussing poster presentations, and furthering these discussions over the refreshment breaks and meals. The highlight of each day was being able to drive around outside the Skukuza Rest Camp to try to spot the various game, predators, and birds in the bush.

As in the past, the plenary and invited speakers were excellent and were prepared to engage with the student delegates, offering valuable insights and recommendations for their research. The topics covered a wide range of photonic materials, **including photovoltaic and solar cell characterization**, upcoming materials that could replace current materials in the field of PV, **luminescent materials, wide band gap materials (such as Ga₂O₃, ZnO, GaN)** that are used for UV detectors as well as transparent conducting coatings. There were also presentations on the **electrical properties and the formation and identification of defects in semiconductors**.

Researchers working with photonic materials who wish to join the next conference should keep an eye out for the announcement via the SAIP mailing list of the next Photonic Materials Conference to be held in 2025.

"I would like to thank the sponsors, Blue Stallion, NRF, Busch Vacuum Solutions, Cengage SA, Hamamatsu Photonics UK, Hitech Lasers, University of the Free State Faculty of Natural and Agricultural Sciences, CB Van Wyk Family Trust, Wirsam Scientific and Precision Equipment, Hiden Analytical Ltd, and Wiley and Sons for their support. I would also like to thank the organising committee, consisting of members of the Physics Departments at the University of the Free State, Nelson Mandela University, and the University of Pretoria as well as Thereza Botha from Technoscene and the SAIP office staff, for all their hard work in making this conference a success," says Jackie Nel.

Reported by Jackie Nel

A new South Africa-UK collaboration focusing on applications of Data Science and AI to physical sciences

The Leeds-Africa Conference on Data Science and AI is a new initiative between the University of Leeds and the University of Pretoria (<https://leeds-africa-hub.github.io>). This creates a forum for sharing insights across research areas that are being transformed by developments in artificial intelligence, machine learning, and data science.



We sought to bring together experts from the UK and across Africa to build new partnerships and collaborations, allowing researchers to share their research with new communities and discover new applications for theoretical developments in mathematical and computational methods.

At the close of registration, we had received over 300 expressions of interest to attend from researchers and/or students across 30 different African countries. From these expressions of interest, we were able to fully support the attendance of 70 delegates with representation from 12 different African countries: Botswana, Eswatini, Kenya, Lesotho, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Uganda, Zambia, and Zimbabwe. Also included in this were 20 Master's degree students based at the African Institute of Mathematical Sciences (AIMS) in Cape Town.



The conference consisted of plenary talks on subjects ranging from astronomy, biology, ecology, waste management, climate, oceanography, healthcare, natural language processing, image-based machine learning, and the ethics of artificial intelligence. The final two days were devoted to participant-led sessions ranging from tutorials on specific techniques, short talks, or discussion sessions on these (and other) topics. Students from AIMS shared their thoughts on attending the conference, a summary of which can be found here: <https://aims.ac.za/2023/10/16/leeds-africa-conference-on-data-science-and-artificial-intelligence/>.

Future conferences, workshops, and initiatives under this programme are currently being considered. The organisers are grateful to the International Strategy Fund from the University of Leeds for providing funding and the University of Pretoria for providing resources that enabled us to hold this conference.

Reported by Jack Radcliff

Material science workshop in recognition of the contributions of Professor Phuti Ngoepe

The University of Limpopo, United Kingdom, and the Centre for High-Performance Computing in South Africa invited fellow researchers and collaborators to a two-day materials science workshop, which was held from the 3rd to the 4th of August 2023 at the Council for GeoScience (CGS) in Pretoria.



The focus of the hybrid workshop was on the development of material science simulation research, in honour of the contributions of Professor Phuti Ngoepe. The theme of the conference was **“Modelling of minerals, alloys, and energy materials”** in line with the work that Professor Ngoepe has done in the areas of minerals, alloys, and battery storage materials. The programme commenced from 12h00 on the 3rd of August and concluded at midday on the 4th of August 2023. This workshop was coupled with an evening function on the 3rd of August where Professor Ngoepe's family and his current and former students, hosted a memorable dinner in celebration of his 70th birthday.

“I must extend my utmost appreciation to every person who partook in and contributed to the successful organization of this conference. Your efforts are invaluable and deeply appreciated. Thank you all.” said Professor Ngoepe

Source: University of Limpopo

SAIP Teacher Development Workshops

In a bid to enhance the quality of education in South Africa, particularly in the field of physics, the South African Institute of Physics (SAIP) has been running a successful teacher development program since 2021. The program has been accredited by the South African Council of Educators (SACE), allowing teachers to earn Continuous Professional Development (CPD) points for attending the workshops.

The SAIP collaborates with several organisations, including the Department of Science and Innovation (DSI), NRF-SAASTA, and universities, to host physical science teacher development workshops. These workshops take

place in various provinces, including Gauteng, KwaZulu-Natal, Limpopo, and Eastern Cape, and saw over 420 teachers participate between July and October 2023.

Workshop Details:

The detailed information in the workshop overview below provided a comprehensive understanding of each event, aligning prospective participants with their professional development needs and schedules.

Workshop	Topics Covered	Attendees and Date	Facilitators
WCED and The Eden and Central Karoo Education District	Electricity, including Electrostatics and DC electric circuits	19, (13 May & 29 July 2023)	2
UJ-SAIP Content & Methodology	Physics, Maths, Maths Lit, Life Science, and Chemistry	80, (Date: 3-6 July 2023)	7
SAIP2023 UNI-ZULU	Physics, Maths, Maths Lit, Life Science, and Chemistry, including physical and virtual experiments.	42, (4-6 July 2023)	7
SAIP 2023 - EC	Chemistry (Chemical Equilibrium, Acids & Bases) and Physics (Electric Circuits), including physical and virtual experiments	60, (17-21 July 2023)	4
SAIP2023 Vhembe	Vertical projectile motion, Electrodynamics, Electric circuits, Reaction rates, Chemical equilibrium, KC Calculations, Interpretation of graphs, Physics Experiments, and Chemistry Experiments	200, (24-26 July 2023)	7
SAIP/NRF-SAASTA	Physical Sciences for Grade 10-12 educators	22, (03-05 October 2023)	4

Impact and Achievements:

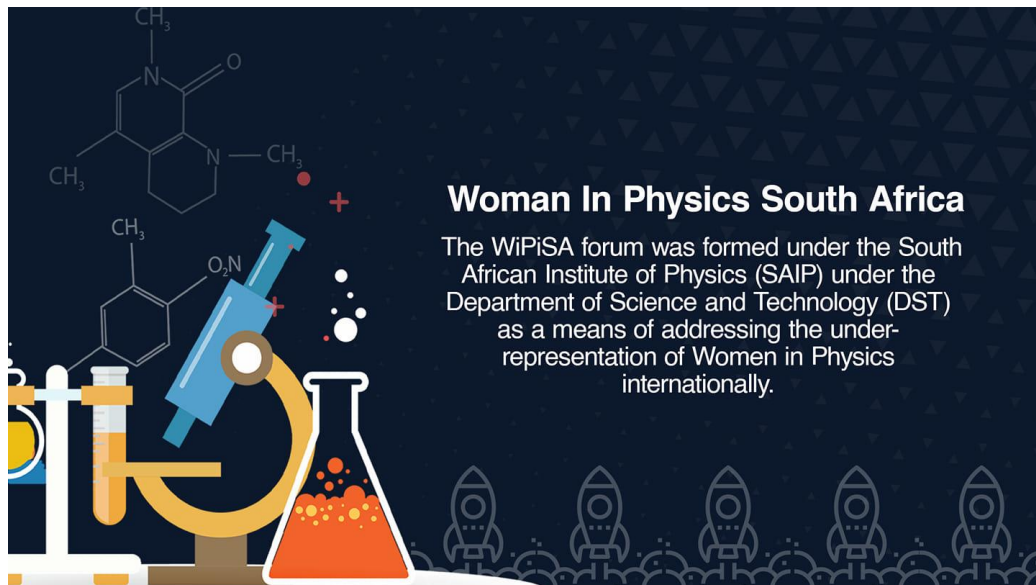
Teachers in physical science have been successfully empowered by the SAIP teacher development programme, which raises their professional knowledge and skills to help them provide effective teaching. The project has been reaching out to various teachers across the various provinces in South Africa and providing them with valuable resources and expert advice. The project was successfully conducted thanks to SAIP's cooperation with other partner organisations, which drew upon the strength and expertise of each organisation.

In South Africa, the SAIP Teacher Development Project makes a significant contribution to physics education. The project contributes to improving the quality of education in our country by providing appropriate instruments and knowledge for teachers. Continued support and collaboration will ensure that the project reaches out to more teachers in South Africa, ultimately benefiting students and a future for science education.

Reported by Ndanganeni Mahani

WiPiSA's Vibrant Year: *A Recap of Engagements, Webinars, and Women's Month Initiatives*

The Women in Physics South Africa (WiPiSA) organization has had a dynamic and engaging year, marked by various activities, department lunches, webinars, and Women's Month initiatives. The highlights showcase WiPiSA's commitment to fostering a supportive community and promoting the role of women in physics.



Department Lunches:

WiPiSA sponsored department lunches at prominent universities, including the University of the Witwatersrand, Stellenbosch University, North-West University, University of the Western Cape, and the University of Free State. These gatherings provided valuable networking opportunities and fostered a sense of community among physicists from different institutions.

Call for WiPiSA Proposals:

WiPiSA issued a call for proposals in 2023, resulting in three selected projects from the University of Venda, the University of Zululand, and Sefako Makgatho Health Sciences University. These initiatives, scheduled for February and March 2023, aim to contribute to the advancement of physics in South Africa.

Engagements and Activities:

WiPiSA's secretary, Dr Joyful Mdhuli, participated in various events, including a panel discussion at the virtual APS Satellite March Meeting. The discussion focused on the experiences of physicists in their home countries, addressing topics ranging from the pleasant aspects of physics research to strategies for increasing interest among young people.



Group photo of the event SAIP Science Forum 2023 Session.

Dr Mdhluli also presented a country poster at the 8th International Conference on Women in Physics and functioned as a mentor at events such as "Stay Awake" for the Girls in Robotics program. Her involvement in the "Girls in STEM Workforce of the Future" career talk and the WiPiSA luncheon at the University of Western Cape highlighted her commitment to promoting STEM careers among young women.

WiPiSA's chairperson, Dr Katekani Shingange, presented a country poster at the 8th International Conference on Women in Physics, highlighting the achievements and challenges for WiPiSA over the past year.

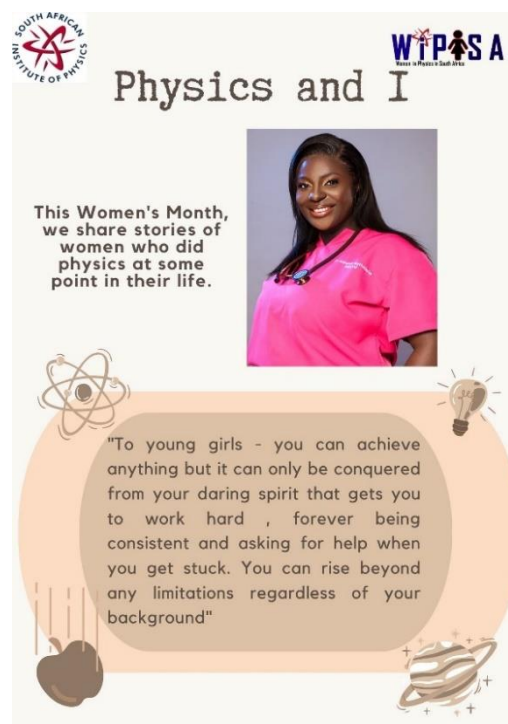
Webinar Series:

WiPiSA's webinar series, an integral part of its mentorship program, covered diverse topics. The webinars addressed issues such as taxation, funding opportunities at the CSIR, and research mentorship, featuring expert speakers and attracting a significant number of participants.

Women's Month Activities:

During Women's Month, WiPiSA introduced initiatives like 'Physics and I' and 'Woman to Woman.' 'Physics and I' celebrated women with a background in physics, exploring how physics has influenced their professions. 'Woman to Woman' focused on women-to-women supervision and mentorship in science and research fields. WiPiSA sponsored four departmental lunches and organized a mentorship event to explore the impact of mentorship on career advancement, particularly in the sciences. WiPiSA's activities throughout the year reflect a commitment to building a supportive community, fostering mentorship, and promoting women in physics. From departmental lunches to impactful webinars and Women's Month initiatives, WiPiSA continues to make significant strides in advancing the role of women in the field of physics in South Africa.

Reported by Dr Katekani Shingange



SAIP Science Forum 2023 Session

The South African Institute of Physics (SAIP) recently conducted a successful session at the 2023 Science Forum South Africa, addressing the role of physics as a basic science in supporting the Department of Science and Innovation (DSI) Decadal Plan and the District Development Model (DDM). The focus was on how physics can contribute to "Education and Skills Development" under the DSI's Societal Grand Challenge 2.

During the session, six speakers discussed various aspects. Dr. Brian Masara emphasized the importance of physics education for economic development, and Prof. Shonisani Agnes Mulovhedzi highlighted the need to introduce basic science in early childhood education. Prof. Sam Ramaila addressed challenges in the Further Education and Training (FET) sector, particularly in the context of the COVID-19 pandemic.

The speakers also discussed community applications of physics, youth skills development, and citizen science. Dr. Masara emphasized the involvement of citizens in science, linking physics with other branches of science to leave a lasting impact in villages. Prof. Mulovhedzi discussed the Early Childhood Development (ECD) Science Teacher Development & Support Initiative, encouraging parents to introduce science toys to spark curiosity in children.

An open discussion followed, covering topics such as engaging grandparents and public-school teachers in science, collaborations with the Department of Science and Innovation, and the potential of making physics popular in culture, especially among young people. Attendees expressed interest in collaborations, with the DSI acknowledging the SAIP's proposal that aligns with various government departments' objectives.

Overall, the session emphasized the need for physics to contribute to socio-economic development starting at the

district level, involving communities, and addressing educational challenges, ultimately aligning with the DSI's broader goals and the District Development Model. The SAIP expressed enthusiasm for continued engagement and collaboration in the coming year.

Reported by Ndanganeni Mahani

Opportunities and Calls

Postdoc positions

North-West University invites applications for a Senior postdoc position in high-energy/multi-wavelength astrophysics. Please see the link below for more information and how to apply: [Senior postdoc position in high-energy/multi-wavelength astrophysics](#)

The University of Fort Hare invites applications for a Postdoctoral Research Fellowship position opportunity. Please see the link below for more information and how to apply: [Postdoctoral Research Fellowship](#)

Source: SAIP Office

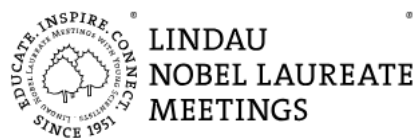
The 73rd Lindau Nobel Laureates Meeting dedicated to Physics.

The Academy of Science of South Africa (ASSAf), in partnership with the Department of Science and Innovation (DSI), is seeking candidates to participate in the 73rd Lindau Nobel Laureate Meeting dedicated to Physics from 30 June to 4 July 2024 in Lindau, Germany. About 600 highly talented young scientists worldwide will be the audience for lectures, panel discussions, and small-size discussion sessions. The Lindau Meetings are outstanding and internationally renowned annual conventions, attended annually by about 30-40 Nobel Laureates and 600 of the most promising Young Scientists from all over the world. Alternating between the disciplines of Physics, Chemistry, Physiology, Medicine, and in addition, Economics, the Lindau Meetings are a unique opportunity to educate, inspire, and connect beyond cultural and political boundaries for the leading scientist of tomorrow.

Eligible applicants should demonstrate a strong commitment to their principal field of study. All nominated participants should meet the following criteria to participate:

- ✚ Applications are open to early-career researchers who are South African citizens and comprising of Undergraduate/Honours, Master's and doctoral students; and postdoctoral students. Specific qualifications for the Master's and doctoral students are:
 - (i) **Master's and doctoral students, who**
 - show excellent academic accomplishments, and have already produced excellent research work, e.g. documented by publications, conference presentations, and/or research awards/prizes.
 - (ii) **Postdoctoral scientists, who**
 - have 2-3 years of postdoctoral experience; have published excellent results, preferably own scientific research in refereed journals, preferably as first or last and/or corresponding author, and have presented their work at international scientific meetings.
- ✚ Applicants must be 35 years or younger at the time of the meeting.
- ✚ Applicants should demonstrate outstanding academic accomplishments.
- ✚ Applicants should be able to communicate in English and have the desire to participate in discussions.
- ✚ Applicants should not hold a permanent position (scientists with permanent positions, particularly a professorship, will not be considered).
- ✚ Applicants should not have participated in previous Lindau meetings.
- ✚ Applicants should commit themselves to be present for the full duration of the meeting.
- ✚ Applicant must show a genuine interest and engagement in science and research.

The evaluation process of the scientists who were nominated or applied for the meeting is currently underway and the deadline for applications has passed, it was on the 20th of October 2023. In spring 2024, the results of the evaluation process will be announced.



Source: ASSAF Website permitted by Dr. Tozama Qwebani

68th Annual Conference of the South African Institute of Physics: Mark Your Calendar for an Enlightening Experience

68th Annual Conference of the South African Institute of Physics

SAIP2024

1—5 July 2024



RHODES UNIVERSITY
Where leaders learn

FIRST ANNOUNCEMENT

We are pleased to announce that SAIP2024 will take place at Rhodes University between 1—5 July 2024. The conference homepage, which will provide more details, will open in due course. We look forward to welcoming you to Makhanda\Grahamstown.



Important dates

31 January 2024	Registration opens
31 January 2024	Abstract submission open
5 May 2024	Abstract submission deadline
25 May 2024	Notice of abstract acceptance
30 May 2024	Registration closes
30 May 2024	Deadline—Payment of registration fees
1 July 2024	Winter school
1—5 July 2024	Conference



Source: SAIP website

SAIP Membership

Physics is a basic science that is a basis for all science and technology disciplines. This results in physics graduates working in every sector imaginable. Therefore, SAIP caters to a wide range of industries and economic sectors. SAIP membership includes all physicists who graduated with at least a physics related degree working in either; industry, commerce, government, academia, research, theoretical physics, or experimental physics, and uses physics skills and thought processes in their job/career.

Why Professional Membership is Important

Academic qualifications are only the beginning of a career in physics and its applications. The need for continuing professional development is widely recognised to be the mechanism by which professionals maintain their knowledge after the formal education process has been completed. By becoming a member of a professional society, one demonstrates their commitment to maintaining competence in their field through continuing their professional development from activities such as conferences, schools, and workshops and abiding by an acceptable code of conduct. Membership in a professional society is an important addition to a physicist's credentials for example when competing for a job membership in a professional society will distinguish one from other applicants with similar qualifications but no professional affiliation.

1. **Stay informed** - News flashes and alerts are sent directly to your email. A quarterly magazine, Physics Comment, will keep you briefed on physics news, government policy, and jobs in industry and academia.
2. **Specialist Groups and Networking - Through** the various activities of SAIP, networks have been established with the African and International Physics communities, to benefit all our members. You will make important new contacts and forge lifelong professional relationships by getting involved in a specialist group.
3. **Save Money** - You'll receive discounted rates for SIAP conferences and have the benefit of paying affiliate membership fees for IOP membership.
4. **Employment opportunity information** - Job advertisements will be displayed on our new website and mailed to members from time to time.
5. **Access to current information on sources of funding grants and scholarships** - Exclusive service provided to our members via a direct email system.
6. **Scientific meetings** - The annual conferences and workshops provide learning opportunities for different specialisation areas and varying degrees of experience.
7. **Especially for the global physics community - You will** have the opportunity to partake in events organised by the SAIP for the Physics community in South Africa as well as Africa: developmental workshops, schools, and conferences.
8. **Additional resources** - Your membership privileges also include information and guidance when [applying for and acquiring visas to study and participate in scientific meetings and research](#) opportunities in South Africa and abroad. There is also an exclusive member-only area on our website.
9. **Career guidance and resources**- Career assistance is provided to all members to find their career path in industry or academia.
10. **Opportunities to win excellence awards** - SAIP recognizes contributions to physics in SA by awarding two different medals and various student prizes at the annual conference.
11. **Teaching and Learning Resources for schools** - As part of our growing outreach programme we provide teachers and learners with the tools and opportunities to allow and motivate more learners to follow careers with physics as a background.

JOIN SAIP TODAY CLICK THE LINK BELOW FOR MORE INFORMATION ON HOW TO APPLY:

<http://www.saip.org.za/index.php/members/membership-info>

Source: SAIP Website

Physics Comment Editorial Policy

Physics Comment is an electronic magazine for the Physics community of South Africa, providing objective coverage of the activities of people and associations active in the physics arena. It also covers physics-related ideas, issues, developments, and controversies, serving as a forum for discussion. It is not a peer-reviewed journal.

Physics Comment publishes innovative reports, features, news, reviews, and other material, which explore and promote the many facets of physics. Physics Comment endeavors to:

- ✚ support and inform the physics community.
- ✚ promote membership of the South African Institute of Physics
- ✚ promote the understanding of physics to interested parties and the general public represent the readers' point of view
- ✚ focus on issues and topics of importance and of interest to the physics community.

We accept submissions on any physics-related subject, which endeavours to inform readers and encourage writers in their research. We aim to be politically, socially, and geographically inclusive in the articles, which we commission and receive. Therefore, we shall not discriminate according to political or religious views. Physics Comment does not support or endorse any individual politician or political party. However, contributions that are being published, may contain personal opinions of the authors. We desire to present unfettered the opinions and research of our readers and contributors. All articles submitted for publication are subject to editorial revision. Such revisions, if necessary, will be made in cooperation with the author.

The views expressed in published articles are those of the authors and are not attributed to the Editorial the Editor will make the final determination of the suitability of the articles for publication.

Declaration by Author

When an author submits material for publication, this means:

1. The author(s) assures the material is original, his/her own work, and is not under any legal restriction for publication online (e.g., previous copyright ownership).
2. The author allows PC to edit the work for clarity, and presentation, including making appropriate hypermedia links within the work.
3. The author gives PC permission to publish the work and make it accessible in the Magazine's archives indefinitely after publication.

The author may retain all other rights by requesting a copyright statement be placed on the work.

Authors should respect intellectual integrity by accrediting the author of any published work, which is being quoted.

Publication Deadlines

Physics Comment is published four times a year.

Issue	Closing Date	Publication Date
Issue 1	28 February	15 March
Issue 2	31 May	15 June
Issue 3	31 August	15 September
Issue 4	30 November	15 December

Specification and Submission of Content

Editorial Tone. As the voice of the physics community, the magazine will create a provocative, stimulating, and thoughtful dialogue with the readers; and provide a variety of perspectives that reflect the dynamism of the physics community.

Article types. The magazine is devoted to articles, reports, interesting facts, announcements, and recent developments in several areas related to physics:

Manuscripts. Solicited manuscripts will be judged first for reader interest, accuracy, and writing quality. The editor reserves the right to request a rewrite, reject, and/or edit for length, organization, sense, grammar, and punctuation.

Re-use. The publisher reserves the right to reuse the printed piece in full or in part in other publications.

Submission and Format. Manuscripts must be submitted to the editor on or before the designated due date. Manuscripts must be submitted electronically, on the prescribed Microsoft Word template available for download from <http://www.saip.org.za/PhysicsComment/>. Manuscripts are to be submitted directly to the editor at: PhysicsComment@saip.org.za.

Style. AP style is followed for punctuation, capitalization, italics, and quotations.

Photography and Illustration. All solicited photography and illustrations should be part of an article and will be judged first for technical quality and editorial appropriateness. The editor and art director reserve the right to request revision or reject any material that does not meet their criteria. The publisher reserves full rights to all solicited photography and illustration, including the right to reprint or reuse graphic material in other publications.

Categories of Content Contributions

Technical articles and reports: These are generic articles of about 1,500 words plus diagrams and pictures. A technical article covers a relevant feature topic. Articles are authored by the writer and publishing a 40-word resume of the author could enhance its credibility. By submitting an article that has been previously published the author confirms that he/she has the right to do so and that all the necessary permissions have been received. The acknowledgment must be made within the article.

News: These are short editorial items usually not more than 250 words. Full-colour pictures must be referenced on the editorial submission and the picture or picture file.

Advertorials: Advertorials could be published when supplied by the client. We recommend a maximum of 500 words plus one or two pictures for maximum impact. A PDF file of the laid-out advertorial should be emailed to the client along with an MS Word file of the text and separate image files of the pictures. It is the client's responsibility to ensure that the advertorial is correct as it is, in fact, a paid-for advert page.

Letters to the Editor: Letters to the Editor are encouraged. The Editor reserves the right to edit for length and format. The Editor will not change the political position of the initial letter. Physics Comment does not publish anonymous letters.

Advertising Policy: The Editorial Board will determine advertising prices for Physics Comment, subject to approval by the SAIP Council. The objective will be to obtain revenue to maintain and develop the magazine. Physics Comment offers classified advertising to subscribers of the magazine for free. The advertisements must be a maximum of 60 words including the telephone number, and there is a limit of three free classifieds per subscriber, per issue. Advertisements may include a photo, which may be reduced in size or resolution by the editor to optimize loading time. All items or opportunities which are being advertised for free, should be physics related. The Editor reserves the right to refuse any advertising, which does not conform to the objectives of the magazine.

Submission of Articles

All articles must be submitted on the prescribed template available for download from <http://www.saip.org.za/PhysicsComment/>

Source: PC Magazine Website