President's report 2018

Submitted at
29 June 2018
Annual General Meeting

1. Council members and portfolios

The SAIP council for the period 2017-2019 consists of the following people:

Executive members of the SAIP council:	**Portfolio on council**
Prof Patrick Woudt (UCT) - President	Astronomy Liaison
Prof Deena Naidoo (Wits) - President-elect	Audit & Risk
Prof Azwinndini Muronga (NMU) - Past President	International Liaison
Prof Andre Venter (NMU) - Treasurer	
Prof Regina Maphanga (CSIR) - Secretary	

Ordinary members of the SAIP council:	**Portfolio on council**
Dr Rudzani Nemutudi (iThemba LABS)	Fundraising
Prof Makaiko Chithambo (RU)	Standards; Awards
Prof Martin Ntwaeaborwa (Wits)	Education
Dr Iyabo Tinuola Usman (Wits)	Industrial Liaison
Prof Ernest van Dyk (NMU)	Division and Forum representative
Mr Luthendo Nethwadzi (Wits)	Student representative

Co-opted members of the SAIP council:	**Portfolio on council**
Dr John Bosco Habarulema (SANSA)	Conferences
Dr Buyi Sondezi (UJ)	WiPiSA; WiPiSA gender champion; Marketing
Dr Hellen Chuma (Johnson Matthey)	Outreach; Public Understanding of Physics

Executive officer of the SAIP:
Mr Brian Masara (SAIP office)

2. SAIP Office

The SAIP office has a full complement of staff and consists of the following people:

Mr Brian Masara	Executive Officer
Mr Tebogo Mokhine	IT Systems Developer and Webmaster
Mrs Ndanga Mahani	Project and Marketing Officer
Mrs Lizzy Sathekge	Secretary

The SAIP council is very grateful to Mr Masara and his team for the smooth running of the SAIP office. The SAIP office is based on the CSIR premises (Building 42) in Pretoria. The office has a boardroom which can be booked for meetings.

3. Divisions and Forums

The SAIP currently has seven divisions, one forum, and one working group. At the 216th meeting of the SAIP council (October 2017), a proposal from the Applied Physics Forum to become a Division was discussed and approved. Following the election of division and forum representatives in 2018, the following people have been elected as chairs of the respective divisions and forums of the SAIP for the period 2018-2020:

Division / Forum / Working Group	**Chair**
Nuclear, Particle and Radiation Physics Division	*Dr Simon Mullins [iThemba LABS]*
Division for Physics of Condensed Matter and Materials	*Prof Japie Engelbrecht [NMU]*
Division for Physics Education	*Dr Sam Ramaila [UJ]*
Applied Physics Division	Dr Phil Ferrer [Wits]

Division / Forum / Working Group [continued]	Chair [continued]
Division for Astrophysics and Space Science	Dr Zama Katamzi-Joseph (Sp.Sci) [SANSA] Dr Brian van Soelen (Astroph.) [UFS]
Division for Theoretical and Computational Physics	*Prof Kristian Muller-Nedebock [SU]*
Photonics Division	Dr Herman Uys [SU]
Forum for Women in Physics	Dr Sylvia Ledwaba [UL]
Biophysics Working Group (under Applied Physics Division)	*Dr Tjaart Kruger [UP]*

Note: Names in italics represent division chairs of the previous 2-year cycle. In these divisions/fora, elections for 2018-2020 chairs still need to happen.

4. IUPAP representation

At the 29th General Assembly of the International Union of Pure and Applied Physics (IUPAP), held on 11-13 October 2017, Sao Paolo, Brazil, the following South African physicists were elected on IUPAP commissions and executive council, respectively, for the period 2017-2020:

IUPAP executive council:

Dr Rudzani Nemutudi	Associate Secretary General
Prof Nithaya Chetty	Vice President at Large (New Members)

IUPAP commissions:

Prof Adri Burger	Commission 4 - Astroparticle Physics (vice-chair)
Prof Trevor Sewell	Commission 6 - Biological Physics (member)
Prof Azwinndini Muronga	Commission 11 - Particles and Fields (member)
Prof Mmantsae Diale	Commission 13 - Physics for Development (member)
Prof Deena Naidoo	Commission 14 - Physics Education (vice-chair)
Prof Markus Bottcher	Commission 19 - Astrophysics (member)
Prof Regina Maphanga	Commission 20 - Computational Physics (member)

IUPAP working groups:

Prof Igle Gledhill	Working Group 5 - Women in Physics (associate member, past chair)

A detailed report from the South African delegation at the 29th General Assembly was presented in Physics Comment, Volume 10, Issue 1 (March 2018).

I would like to thank all the members of the South African physics community who have served on IUPAP commissions and the IUPAP executive council in the previous three-year period (2014-2017), those who have continued to serve in the present three-year cycle, and those who have joined a commission for the first time this cycle. Your voice on these commissions and structures of IUPAP, representing physics in South Africa and physics on the African continent, is extremely important for the continued development of Physics across the globe, and for creating important continental and international partnerships.

South Africa currently has three shares of IUPAP, which make us eligible to two votes at the General Assembly and a nominal three representatives on commissions of IUPAP. Over the past two three-year cycles South Africa has been extremely well represented on IUPAP commissions and executive council. In the 2014-2017 cycle, South Africa had representation on 5 commissions, 1 working group, and 1 representative on the executive council of IUPAP (Dr Rudzani Nemutudi - Associate Secretary General).

The South African national committee of the IUPAP intends to submit a request to the NRF and ICSU South Africa to increase the number of shares from three to five in recognition of the consistent excellent representation of South African experts on commissions of interest to South Africa.

5. IUPAB representation

South Africa has good representation on the International Union of Pure and Applied Biophysics (IUPAB). SAIP is a tier 3 member of IUPAB, and Prof Trevor Sewell was elected in 2017 on to the council of IUPAB at the 2017 IUPAB meeting in Edinburgh. His portfolio on the council of IUPAB is managing a task force for Education and Capacity Building. A workshop on "Biophysics and Structural Biology at Synchrotrons", scheduled to be held in Cape Town in January 2019, is one of the outputs of this task force. Please join me in wishing Prof Sewell all the best in his new role on the IUPAB council, furthering the development of Biophysics, not only in South Africa, but in Africa as a whole.

Earlier this year, the SAIP has submitted a request to the NRF to incorporate the payment of the annual membership fee of IUPAB through the formal structures of ISCU South Africa. We are awaiting the outcome of this request.

6. Task teams of the SAIP

The SAIP currently has two active task teams of council: a task team on collaborative publishing (established in 2014, and chaired by Prof Igle Gledhill), and a task team on the future of NITheP (established in 2017, and chaired by Prof Patrick Woudt). Both task teams are actively involved in broader national discussions.

At the 218th meeting of the SAIP council, council resolved to establish two new task teams of council. One task team will focus on the matters around the SAIP conference proceedings (chaired by Prof Makaiko Chithambo) in response to queries around the long-term sustainability of the current model of the SAIP conference proceedings. The second new task team is focused on Physics Education (chaired by Prof Martin Ntwaeaborwa), with a mandate to discuss the development and implementation of a strategy on improving physics education. At the core of this task team are the recommendations of the Review of physics training in South Africa as presented in the 2015 Strategic plan on the enhancement of Physics training in South Africa. This task team will also provide a national platform for a discussion around a decolonised physics curriculum.

7. Basis Sciences Platform of the Department of Science and Technology

The Department of Science and Technology has established the South African Basic Sciences Platform (SABSPlat) in 2017. The SAIP is represented through its president and the executive officer, and is the voice of physics on this platform. All the basic sciences are represented. To date this platform has met twice (27 July 2017 and 22 March 2018).

The SAIP will help to organise two panel discussions on basic sciences at the upcoming 2018 Science Forum (December 2018), one on 'Basic science and multi-disciplinary science opportunities at Synchrotron light sources', and one on 'Data science transforming society'. The SAIP executive office will communicate further details around these two panel discussions, and the 2018 Science Forum, in the coming months.

8. Projects of the SAIP

8.1 Review of Physics Training in South Africa

Following the SAIP's review of Physics Training in South Africa, a number of the recommendations are being implemented, and a further implementation plan of the strategic goals is being developed by a new task team of council (see also item 6 of this report).

It is worth repeating the strategic goals that have emerged from the SAIP's review of Physics Training in South Africa:

- Improve physics core skills at undergraduate level
- Engaging DHET on meaningful curriculum reform
- Adoption of the draft benchmark statement
- Establishment of a national Physics teaching and learning platform
- Improving the quality and skills of Physics teachers in South Africa
- Improving and expanding the SAIP physics teacher development project
- The need to establish collaborative partnerships with DBE on teacher professional development
- Improving university training of Physics teachers
- Improving undergraduate Physics instruction at institutes of higher learning

I refer to the full Strategic Plan on the Enhancement of Physics Training in South Africa, available on the SAIP web site: http://saip.org.za/index.php/projects/review-of-physics-training-in-sa

Here I highlight recent activities around a number of these strategic goals:

Adoption of the benchmark statement: The South African Physics benchmark statement has already been endorsed by eight Physics departments in South Africa. The benchmark statement and the logos of the endorsing institutions are available on the SAIP web site. If your logo is not there yet, please send us your logo for inclusion on the web site as a statement of endorsement.
For details see: http://saip.org.za/index.php/sa-physics-benchmark-statement

Establishment of a national Online Physics Teaching and Learning Platform: An MoU was signed between SAIP and NECSA for the development of the online teaching platform. A prototype of the online teaching and learning system is currently under development.

Teacher development activities: This is one of the flagship activities of the SAIP. Over the past 12 months a number of highly successful teacher development activities have taken place, including activities in the Eastern Cape at NMU surrounding the National Science Week 2017 (29 July 2017), in the Vhembe district (24-28 July 2017), and in the Eastern Cape (week of 3 April 2018). We are indebted to the many volunteers that have helped to make these teacher development activities a sustainable success. A special thank you to Prof David Wolfe and Mr Case Rijsdijk for their overall coordination of this program, and to our volunteers in the Hub & Spoke model for running successful activities in the Eastern Cape and the Vhembe district.

A number of teacher development activities have been planned for the coming months, including the Limpopo teacher development activities (23-27 July 2018) and a 1-year programme running at UWC. The UWC team received R30k funding from NSTF to run the teacher development program. The ICPE2018 (International Conference on Physics Education - 1-5 October 2018, Johannesburg) will also run a teacher development workshop as part of the IUPAP sponsored conference.

We are always looking for more volunteers to help grow this important activity of the SAIP. If you are interested in helping, please contact Brian Masara, who will put you in to contact with the relevant people through the SAIP Hub and Spoke model.

8.2 South African Physics Olympiad

Case Rijsdijk, who became an honorary member of the SAIP in 2016, continues to run the South African Physics Olympiad (SAPhO) with great success. The SAIP has received R74k from SAASTA for the 2018 edition of the South African Physics Olympiad. SAPhO 2018 will run in August and will use an online platform.

Mr Angus Thring (Bishops - grade 12, Rondebosch) won the 2017 edition of the South African Physics Olympiad with score of 86%. The SAIP Medal will be presented to him at the Gala dinner of the 63rd SAIP annual conference in Bloemfontein on Friday 29 June 2018. In second place was Mr Thomas Hettasch (Deutsche Schule - grade 12, Pretoria) with a score of 78%, and in third place Mr Graham Mitchel (Pretoria Boys High School, Pretoria) achieved a score of 76%.

I would like to thank Case Rijsdijk for managing the SAPhO program, and for his tremendous energy and drive in ensuring the SAPhO grows from strength to strength. This important activity is hosted by SAIP and is an excellent means of identifying and motivating/nurturing young academic talent in South Africa. It is an important standard of academic excellence. The SAPhO 2016 winner (Mr Conrad Strydom) was South Africa's 2016 Matric top achiever (see 2017 President's report).

8.3 Entrepreneurship for Physicists

SAIP organised a highly attended Physics in Industry day at the annual conference in Bloemfontein in 2018. An SAIP working group has been established consisting of Dr Iyabo Usman, Prof Ernest van Dyk, Prof Andrew Forbes and Mr Brian Masara. This working group will be driving the strategic planning to aid the continuation of the program and the long-term sustainability.

8.4 Outreach and Public understanding of Physics

In March 2018, SAIP participated in SciFEST with the assistance of the colleagues from the Physics department at Rhodes university. SciFEST 2018 attracted more than 62,000 visitors. Once again, it was a very successful event, made possible thanks to the volunteers from the Rhodes physics department. I would like to thank Prof Makaiko Chithambo and his team for their hard work, and support of SAIP, at SciFEST2018.

SAIP is active on social media and on LinkedIn. SAIP's reach on Facebook continues to grow, moving from 820 likes to 1170 likes over the last year.

Figure 1. Prof Makaiko Chithambo (Rhodes University) and members from the Physics department at Rhodes University talking to learners at SciFEST2018.

8.5 National Science Week through Hub and Spoke Model

The SAIP has received R150k from SAASTA to run activities during the 2018 National Science Week through our Hub and Spoke model. Ten Physics departments will take part in these activities during the week of 30 July to 4 August 2018. Thank you to all the colleagues and volunteers who have already participated in these activities. If you are interested in taking part in these activities, please contact Brian Masara.

The theme for the 2018 National Science Week is **Deepening our Democracy through Science**. SAIP will run a teacher development workshop in the Vhembe district in the week leading up to the National Science Week (see also item 8.1).

2017 National Science Week reach:

Category	Number
Learners	3171
Educators	225
Students	526
Scientists/Researchers	34
Journalists	2
Traditional leaders/Parliaments	2
Industry	5
Other	146
Facebook posts (4)	3388
General public	±600,000*

* The approximate reach is higher than previous years due to the inclusion of a UniVen Radio Programme at Phala-Phala FM.

Figure 2. UniVen team at Vuwani Science Centre.

Figure 3. Dr Eric Maluta (University of Venda / UniVen) addressing learners at Eskom Expo held at Mbilwi High.

Figure 4. 2017 National Science Week (NMU) activities at Nelson Mandela University.

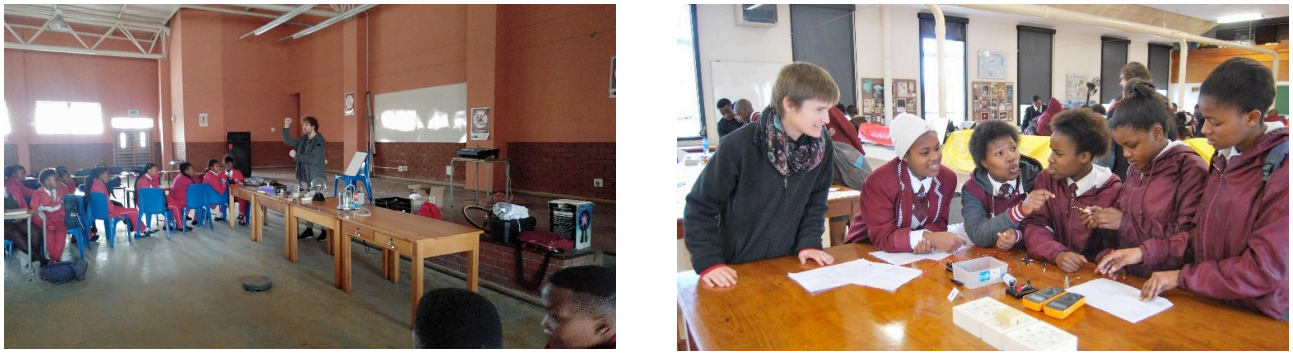

Figure 5. 2017 National Science Week (US) activities at Manyano High School and the University of Stellenbosch.

Figure 6. 2017 National Science Week at the University of Zululand (stargazing: left image) and at the University of Limpopo (seminar: right image).

8.6 Physics Comment magazine

Prof Thomas Konrad has served as editor of PC magazine for seven years, and together with Prof Dave Walker (since 2013) formed the editorial team that has kept our community informed of all the activities in Physics in South Africa and around the globe, and has engaged our community in critical dialogues around fundamental issues in Physics in South Africa. At the end of 2017, Prof Konrad and Prof Walker handed over the editorial responsibility of PC magazine to a new editorial team, consisting of Prof Deena Naidoo, Dr Buyi Sondezi and Dr Hellen Chuma.

I want to thank Prof Konrad and Prof Walker for their many years of dedicated service as editors of PC magazine and wish the new editorial team all the best in continuing to provide a platform for in-depth features and critical dialogues relevant to the Physics community of South Africa.

8.7 Server migration

The SAIP has acquired a new server to run all our web services. The new server is hosted at the South African Astronomical Observatory (SAAO), free of charge to the SAIP. I sent a letter of thanks on behalf of SAIP to the SAAO director to express our gratitude. The new server is expected to host all our current web services and will be expanded to include the **Continuous Professional Development** (CPD) system for our PrPhys and PrPhysTECH members, as well as the **Online Physics Teaching and Learning Platform** (OPTLP) currently under development. Mr Tebogo Mokhine will complete the server migration after the SAIP2018 conference. At that point, our updated web site will also go live.

9. Membership matters

9.1 Professional designations: PrPhys and PrPhysTECH

The South African Qualifications Authority (SAQA) approved the new professional designation of Professional Industrial and Physical Science Technologist (**PrPhysTECH**). This designation proposed by the SAIP in response to a shortage of skills in the country in this area, and this was approved by the SAIP membership in 2017 (see President's report 2017 - constitutional vote change), and subsequently gazetted by government.

Following the gazetted approval of this professional designation, the SAIP has started to receive, review and approve applications for PrPhysTECH membership of the SAIP. Applications for membership of professional designations (PrPhys and PrPhysTECH) are considered by the Standards Committee of the SAIP. I would like to thank the Standard Committee for carefully adjudicating all the professional designation applications.

It is good to note that PrPhys is one of the fastest growing membership categories of the SAIP. Between December 2016 and December 2018 there was a 24% increase in membership in this category.

9.2 Membership overview

Category	June 2018	Dec. 2017	Dec. 2016	Dec. 2015	Dec. 2014
Associate	69	58	37	17	10
Emeritus	6	6	6	6	6
Institutional	3	3	3	3	3
Fellow	18	17	17	17	17
Honorary & Emeritus	38	38	37	36	37
Ordinary	254	250	250	237	220
Pr. Phys	240	225	181	142	72
Pr. Phys TECH	4	-	-	-	-
Retired	8	7	7	7	7
Students	252	242	230	189	162
Subscribers	1	1	2	2	2
E-members (non paying)	2970	2530	2200	53	35
Total	**3863**	**3377**	**2970**	**709**	**571**

10. Awards

During every 'even' year, the SAIP requests nominations from the community for the SAIP Gold medal, formerly known as the de Beer's Gold Medal. The SAIP Gold award is made *for outstanding achievements in any of the following facets of any branch of Physics: research, education, technology and industrial development. As the highest standards are applied, the award is intended to be the greatest distinction that is conferred in South Africa for achievements in Physics.*

The winner of the 2018 SAIP Gold medal will be announced during the Gala Dinner of the SAIP2018 annual conference. The winner will be invited to give a plenary talk at the SAIP 2019 annual conference.

During every 'odd' year, the SAIP requests nominations from the community for the SAIP Silver Jubilee medal. The award shall be made for *the outstanding achievements by a young physicist in any of the following facets of any branch of Physics: research, education, technology and industrial development. Awards shall be made to persons who are less than 35 years old on the closing date for the receipt of nominations. Allowance for career interruptions may be made for a maximum of eight additional years.*

A request for nominations for the 2019 Silver Jubilee medal will be send out during the first half of 2019. I encourage the SAIP membership to identify and nominate candidates for the 2019 Silver Jubilee medal.

11. Fundraising and Financial Sustainability

The financial sustainability of the SAIP and the executive office is of critical importance to the SAIP council. The SAIP executive office is currently supported by a three-year grant from the DST for office operations and salaries. Project-based proposals are submitted regularly to SAASTA to support our activities.

11.1 SAIP Physics for Development Foundation

In order to raise external funds for our core activities, the SAIP council has established a "Physics for Development Foundation" trust, which has now been successfully registered. An application for donor deductible status has been submitted. Once the donor deductible status is approved, the SAIP council will re-engage with the SAIP Donor relations manager (Mrs Jill Ritchie, see 2017 President's report).

The fund raising efforts under the Physics for Development Foundation trust are aimed towards supporting the core activities of the SAIP, namely the implementation of the strategic goals listed in the Strategic Plan on the Enhancement of Physics Training in South Africa (see item 8.1), and the expansion of the teacher development activities. We hope that it will also allow us to address issues around looking for subsidy for conferences.

12. International collaborations

12.1 Physics in Africa project

The South African Institute of Physics, in collaboration with the American Physics Society, International Centre for Theoretic Physics, European Physics Society and Institute of Physics is part of a project to support the development of Physics in Africa (see 2017 President's report). A survey was conducted in 2017 in which all Physics departments in (South) Africa were approached. The next stage of the Physics in Africa project is to identify priority projects in experimental physics, physics education, and communication.

12.2 African School of Physics

The African School of Physics (ASP) is currently being held in Windhoek, Namibia. This is a two-yearly event that consists of multiple components: the Biennial African Conference on Fundamental Physics and Applications (ACP2018), the African School of Physics (ASP2018), and the associated ASP forum. From the SAIP council, Prof Muronga (immediate past-president) and Prof Woudt (president) will attend ASP2018, and from IUPAP Prof Chetty (IUPAP Vice-president: New Members, see item 4) will also attend ASP2018.

The SAIP is closely involved in the partnership around the African School of Physics, in particular through the financial management of a multi-year grant towards the organisation of the African School of Physics.

12.3 African Light Source

The SAIP has assisted the African Light Source (AfLS) steering committee in the establishment of a non-profit organisation trust. This process has been completed and the trust has been established. The SAIP will assist the AfLS activities in the same way as we are assisting the African School of Physics, through logistical support via the SAIP office, and the financial management.

13. Conferences and proceedings

13.1 SAIP Annual Conference

The 2016 SAIP conference proceedings were published in December 2017. I would like to thank the review panel, and all the individual reviewers, for their participation in the review process. The proceedings are an important reflection of the quality of the annual conference. For the 2017 SAIP proceedings, a review panel will be established shortly to ensure that the proceedings will be published in 2018.

On behalf of the SAIP council and all of us at the 63rd SAIP annual conference, I would like to express my most sincere appreciation to Prof Koos Terblans and his team of staff and students of the University of the Free State for running a fantastic conference.

Looking ahead at next year, it is my pleasure to announce that the 64th SAIP annual conference in 2019 will be hosted by the **University of Venda**.

13.2 International conferences in the last 12 months

Over the past 12 months a number of international physics conferences came to South Africa, often the first time that those conferences were held in Africa. I want to thank the main organisers of those conferences for their efforts and dedication to bring these large international meetings to South Africa. Hosting these large international conferences in South Africa is of great benefit to the South African and African physics communities, and in particular to the postgraduate students and emerging researchers. I would like to thank Prof Makaiko Chithambo (LED2017), Prof Markus Böttcher (Texas 2017), and the SAIP office (IAU S339), in particular, for running very successful conferences.

A selection of large international conferences hosted in South Africa over the past 12 months:
- LED2017 - 15th International Conference on Luminescence and Electron Spin Resonance Dating;
- IAU S339 - Symposium 339: Southern Horizons in Time Domain Astronomy;
- Texas 2017 - 29th Texas Symposium on Relativistic Astrophysics.

13.3 Forthcoming conferences

The International Conference on Physics Education (ICPE) 2018 will be held in South Africa, from 1 - 5 October 2018. The conference will be co-hosted by the SAIP and the School of Physics of the University of Witwatersrand, jointly with IUPAP Commission 14 (Physics Education, see also item 4 of this report). The main theme of the conference is “Physics Education for Development: a focus on context”.

For details and registration, see: http://events.saip.org.za/conferenceDisplay.py?confId=93

Acknowledgements

I would like to acknowledge the excellent support from the SAIP executive office, and the council members of the SAIP in their roles of their respective portfolios. A particular word of thanks to the executive officer, president-elect, treasurer, secretary and the immediate past-president for their dedication to the SAIP. Finally, and foremost, I would like to express my sincere gratitude to all the volunteers within the SAIP who assist us in all the activities of the SAIP through the successful Hub and Spoke model. You are the voice of Physics in South Africa.

Prof Patrick Woudt
President: South African Institute of Physics