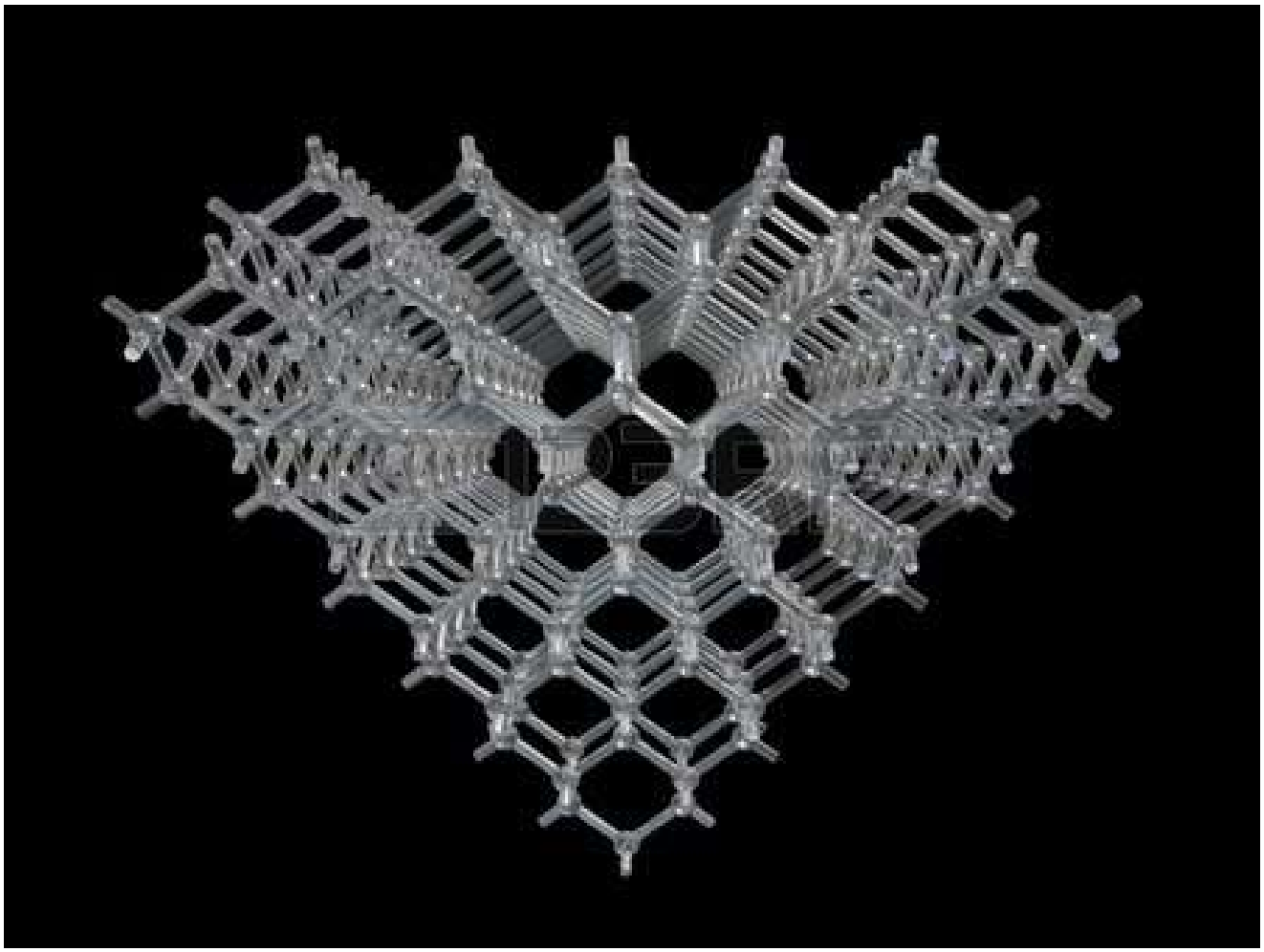
South African Institute of Physics



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President's Report 2014-2015

I Gledhill

SAIP AGM

3 July 2015

This is the Diamond Jubilee of the South African Institute of Physics, and the 60th Annual Conference of the South African Institute of Physics. On behalf of the present Council, may I congratulate the physics community on its remarkable achievements over the last six decades? The events of sixty years are perhaps outside the scope of an Annual Report, but fortunately there is a supporting reference for at least the first 50 years in "Physics in South Africa"[1]. There has been both continuity of engagement, and considerable growth and innovation.

I would like to thank our hosts, NMMU and Rhodes University, represented by Prof. André Venter and Prof. Makaiko Chitambo, the Local Organising Committee members, and Eastern Sun, for letting us invade both the Eastern Cape and their lives. The hosts very rarely have time to see the impact made by the action of scientific hospitality, but I can assure you all that immeasurable impact results. This has been a productive and enjoyable conference. Thank you!

It gives me great pleasure to summarise the events and initiatives of the last year.

1. Education

"The function of education is to teach one to think intensively and to think critically. Intelligence plus character - that is the goal of true education." Dr Martin Luther King, Jr.

The Heads of Departments have tasked SAIP to assist in the struggle to produce more physics graduates who are critical thinkers. SAIP strategy is to tackle this at two levels: in Undergraduate teaching and learning, and with School Teachers.

Review of Undergrad Teaching and Learning[2]

At present, enrolment rates are higher, attrition is higher, and graduation rates are lower. 27% of students (across faculties) graduate in the regulation time. 55% of students (across faculties) never graduate at all. There is widening access, but not improved success. A shift in emphasis from numbers to quality is necessary. A shift from a rigid curriculum to a different rigid curriculum is *not* what is needed. The physics community in universities is aware of all these things: it is leading in its ability to do something about them.

The implementation of the Recommendations of the Undergrad Review[3] is moving forward, both formally, and due to the efforts of individuals who can make changes based on the Recommendations straight away.

[1] Physics in South Africa, ed. P.R. de Kok and H. Moraal, SAIP, 2013

[2] Council on higher Education & SAIP, Report on Review of Undergraduate Physics Education in Public Higher Education Institutions, 2013

[3] Council on Higher Education & SAIP, Report on Review of Undergraduate Physics Education in Public Higher Education Institutions, 2013

The Heads of Departments and Schools met in the National Strategic Planning Meeting on the 26 – 27 March 2015 at St. Georges Hotel near Pretoria. There is, to everyone's delight and astonishment, significant agreement on how to exchange and implement best practice within the present curricula, or within reformed curricula[4]. Implementation of the 11 Recommendations of the Review of Undergrad is well under way. The Heads of Schools and Departments have always been committed to better teaching and learning, and are remarkably committed to sharing best practice and improving at all levels. The report of this meeting has been started. Some projects that the Executive Office is pursuing right away include

- Ratification of the Benchmark Statement and the Review Recommendations,
- Development of a physics teaching and learning materials sharing platform, and
- Actions towards improving the Teacher Development Programme and including more stakeholders.

SAIP is grateful for funding of £5000 from UK FCO[5] Prosperity Fund in 2014.

Igle Gledhill, Brian Masara, and David Wolfe have visited 14 Physics Departments across the country so far, to engage in listening and discussing the Review implementation.

Teacher Training 1

Underpreparedness of learners was identified as a major problem by the Review. The decision was made to focus on intervention to help teachers to understand physics concepts better, by in-service training, and in university training.

- Between July 20115 and July 2015, approximately 1100 teachers will have participated within the SAIP-IOP[6]-UJ Soweto Science Centre Pilot Project. The Science Centre has become a lab, in which conclusions can be drawn about learners and teachers in action.
- Prof. David Wolfe, IOP Volunteer Co-ordinator for South Africa, has been driving fund raising. In April, the UK Prosperity Fund announced a grant of £ 22 996 for the project.
- Prof. David Wolfe, Case Rijsdijk, Dr. Sam Ramaila, Prof. Azwinndini Muronga, and Brian Masara are thanked for the enormous contribution of their team.

"However beautiful the strategy, you should occasionally look at the results." Winston Churchill

- Does this intervention work? Physics Education researcher Dr Kathleen Foote will be taking up a Post-Doc position at UJ with the aim of evaluating the results.

Teacher Training 2

New teachers are trained at universities, but there are only a few cases in which physics departments or physics education researchers are involved. With the help of Prof Wolfe, engagement between university physics and education departments/schools has begun.

[4] Council on Higher Education, A proposal for undergraduate curriculum reform in South Africa: the case for a flexible curriculum structure, 2013

[5] United Kingdom Foreign and Commonwealth Office

[6] Institute of Physics, London

11 Review Recommendations for Undergrad Teaching and Learning

1. *SAIP: coordinate implementation.*
2. *Adopt a 4 year Physics undergrad programme.*
3. *Research ways of teaching under-prepared students.*
4. *Use more appropriate, more rigorous, ways of monitoring and evaluating Teaching.*
5. *Guard against adjusting the standard of degrees to cope with student lack of preparedness.*
6. *Intervene to improve student work ethic.*
7. *Play an active role as a Department in Teacher Training.*
8. *Encourage and support women in the field.*
9. *Form Physics communities of practice at the regional and national level.*
10. *Track graduate experience.*
11. *SAIP: form an action plan.*

Additional actions

Prof Bill Phillips, NL, has been invited to visit South Africa, and has accepted.

2. SAIP is a Registered Professional Body

Pr.Phys

The SAIP application under the authority of DHET[7] and SAQA[8] was published in the government gazette. Errors in the publication were corrected. Registration has been completed and SAIP is authorized to provide a professional registration service. To date, 57 Pr.Phys applications have been approved by the Standards Committee, chaired by Prof Johan Malherbe.

Continuous Professional Development

Professional CPD[9] Monitoring systems and joint marketing are under discussion with Dr. Rolf Becker, the Executive Director of SACNASP[10].

Critical Skills visa applications

With its Professional Body status, SAIP's Standards Committee has supported 18 Critical Skills Visa applications.

3. DHET Publication Unit Incentive Scheme task team

SAIP Council Task Team has developed position papers on the issue that papers with over 100 authors are not recognized by the Incentive Scheme, to the detriment of universities and especially individuals.

- Members met with DHET University Policy and Development Support Unit on the 12 Nov 2014. In this meeting, DHET members stated that the scheme was never intended for use in evaluating individuals.
- Letters have been sent to the Vice Chancellors of UKZN concerning an individual case in 2014 and 2015. SAIP is In contact with both NRF[11] and ASSAf[12].

[7] Department of Higher Education and Training

[8] South African Qualification Authority

[9] Continuous Professional Development

[10] South African Council for Natural Scientific Professions

[11] National Research Foundation

[12] Academy of Science of South Africa

- The matter will be raised with the Deputy Vice-Chancellors' Forum in 2015.
- An update on the draft SAIP Position Paper and a communiqué from the Task Tea on their findings is expected.

4. International

- The IOP-SAIP partnership has been of real benefit in education and science. A new Memorandum of Understanding is under consideration.
- The IUPAP National Committee includes Council and IUPAP representatives. It has met, as scheduled, once this year.
- NSBP[13] arranged an extraordinary set of meetings for SAIP's President in Washington DC in 2015. The potential for collaboration and assistance is somewhat overwhelming. Specific initiatives already in action are
    - International Pulsar Timing Array collaboration
    - National Institute of Science and Technology Neutron Facility collaboration
    - Strong links catalyzed between the National Cancer Institute NCI and the South African Association of Physicists in Medicine and Biology SAAPMB, and the South African Medical Physicists Society SAMPS
    - Collaboration between the SAIP Biophysics Group and The Biophysical Society.
- SAIP continues to be represented at the SA-ICSU[14] President's Forum, where issues across science can be raised. South Africans are well represented in ICSU structures.
- A statement condemning Xenophobia is on our website.
- SAIP was invited to celebrate Nobel Night for Physics at the Swedish Ambassador's House in 2015, where I had the honour of giving an after-dinner speech.

Prof. Simon Connell and Prof. Azwinndini Muronga are thanked for their work in science diplomacy and in real contributions to South Africa.

5. IUPAP Representation

The IUPAP[15] General Assembly in Singapore was attended by Azwinnndini Muronga and Igle Gledhill. An impromptu meeting of African representatives was held. South Africa has a high representation for its membership status at IUPAP, as follows.

[13] The National Society of Black Physicists, USA

[14] International Council for Science

[15] The International Union for Pure and Applied Physics

	Associate Secretary-General	Rudzani Nemutudi
C4 Astroparticle Physics	Secretary	Prof Adri Burger
C6 Biophysics	Member	Prof Trevor Sewell
C13 Development	Member	Dr Mmantsae Diale
C14 Education	Member	Prof Deena Naidoo
C19 Astrophysics	Secretary	Prof Patrick Woudt
Working Group on Energy	Member	Wikus van Niekerk
Working Group on Women in Physics	Chair	Igle Gledhill

6. International Conferences

- The first meeting of the African Light Source community will be held at ESRF[16] in early 2015, with the guidance of Prof Simon Connell.
- SAIP will be hosting the IUPAP Conference on Computational Physics in Pretoria in 2016 with the leadership of Prof. Nithaya Chetty.
- The 15th International Conference on Luminescence and Electron Spin Resonance Dating will be held in Grahamstown in 2017 under the leadership of Prof. Makaiko Chitambo.
- A bid is being submitted through the Astro Community, guided by Prof. Patrick Woudt, to host the IAU General Assembly in 2021.
- The African School of Fundamental Physics and its Applications will be held in August 2016 in Rwanda, and several members of the SA-CERN team are participating in the organization. The NRF Liaison Section has already committed partial financial support. A new feature is that the NRF will be working in a closer partnership with the organisers going forward, to develop the suite of deliverables.

7. Conference Organisation

- The SAIP Executive Office now provides a Scientific Conference Organisation capability, with full provision for delegate registration and correspondence, conference papers and proceedings (including abstract submission and review tracking, paper submission and review tracking and correspondence and publication), and scientific programme printing. The INDICO system provides meeting and agenda facilities on the web with document upload and archiving.

8. SAIP Annual conferences

Proceedings

The emphasis is on the quality of science within the South African community. The status of the conference proceedings of the various years as on 10 June 2015 is as follows.

[16] The European Synchrotron Radiation Facility

Year	Total number of papers received	Papers rejected or withdrawn	Papers for which no reviews were completed	Papers published
2011	185	40	0	145 (78%)
2012	183	51	27	105 (57%)
2013	116	25	0	91 (78%)
2014	159	51	0	108 (68%)
2015	120 anticipated			

Heads of Departments and Schools have been alerted to changes under consideration by DHET to approval and accreditation of conference papers. Prof. Ilsa Basson is thanked especially for her signal contribution to the success of the Proceedings and the Conferences. Without her experienced and determined guidance, and the dedication of Brian Masara, Roelf Botha and Juan Grey in the SAIP Office, it is unlikely that the publication of Proceedings would have succeeded.

National Conferences

While many national conferences in various areas of physics have taken place, the success of the 6th South African Conference on Photonic Materials in May 2015 is notable. This conference brings together many Divisions and Forums of SAIP.

Associated Meetings and Events

The number of related and associated meetings is rising steadily, and in 2015 included the following.

- The NASSP Consortium Inaugural Meeting
- The National Laser Centre Rental Pool Programme Meeting
- The Winter School: Photonics
- The WiPiSA lunch and the Student lunch
- Council meeting with Heads of Department
    - A function of this meeting is to identify issues of common concern in the physics community, and if possible, to formulate projects to address them. The Undergrad Review and implementation arose from this meeting.
- Council meeting with Division and Forum Chairs
- Public Lectures
    - It is notable that Teachers have been invited to public lectures. The intention is to increase the involvement of school Teachers in SAIP events.
- The Astronomy Town Hall (independent, in the week before the SAIP Annual conference).

9. Stakeholders

- DST has continued to support SAIP, both in providing a grant to assist the vital Executive Office, and in involvement within the scientific community and the flow of information and advice in both directions. The SAIP expresses great gratitude for this support, since without the Executive Office, the level of contribution made by SAIP to the community and to scientific infrastructure would drop dramatically. DST has formed a Basic Sciences Platform which includes SAIP.

10. Registration as a Non-Profit Organisation

The SAIP annual report and audited financial statements were submitted to the Department of Social Development in December 2014. The Registration Number is 130-172 NPO.

11. Membership

Membership is approximately 600. In the last year, 54 new members have been ratified.

12. Divisions and Forums

Group	Chairperson
Nuclear, Particle and Radiation Physics Division	Dr. Simon Mullins
Division for Physics of Condensed Matter and Materials	Prof. Japie Engelbrecht
Division for Physics Education	Mr. Sam Ramaila
Applied Physics Forum	Prof. Ernest van Dyk
Division for Astrophysics and Space Science	Prof. Chris Engelbrecht (UJ) : Co-chair Astrophysics
	Prof. John Bosco Habarulema: Co-chair Space Science
Division for Theoretical and Computational Physics	Prof. Kristian Müller-Nedebock
Photonics Division	Prof. Erich Rohwer
Forum for Women in Physics	Prof. Aletta Prinsloo
Biophysics Working Group within the Applied Physics Forum	Dr. Tjaart Kruger

- WiPiSA[17] has gone from strength to strength with Prof. Aletta Prinsloo as Chair. A call for Projects resulted in funding of 7 projects. Many excellent proposals were received which could not be accommodated within the budget. An article was published by Dr. Iyabo Usman in Optics and Photonics News. Hosting of Departmental Lunches continues. Prof. Liesl Folks spoke at SAIP 2015. The Forum focusses on
    - Attracting girls and women into physics
    - Retaining and promoting women in physics by improving institutional and leadership structures.

13. Portfolios, Committees and Task Teams of Council: highlights

- Risk and Audit Committee: Prof. Frikkie Scholtz is thanked for his careful and experienced eye.
- Awards Committee and Electoral College: the Silver Medal award process has been conclude. Results will be announced at the 2015 Banquet. Prof David Wolfe has been elected an Honorary Member. Prof. Kristian Müller-Nedebock is thanked for his sterling service.

[17] Women in Physics in South Africa

- Industrial Liaison: Dr. Mmantsae Diale is thanked for her work, which is particularly through the Applied Physics Forum.
- Fundraising: Dr. Mmantase Diale, and Brian Masara, as Executive Officer are thanked. In particular, Brian is thanked for his outstanding success in collaboration with Prof David Wolfe during 2014/2015.
- International Liaison: is summarized above.
- Market and Outreach Portfolio, and Physics Comment Editorial Board: material raising the Image of Physics is under development. A new Careers Brochure made its debut at SAIP2015. Physics Comment has become an outstanding newsletter and forum for debate under Prof Thomas Konrad and Prof Dave Walker. Words cannot express Council's gratitude adequately.
- Conference Portfolio: Prof. Ilsa Basson is thanked for outstanding work in the 2013. 2014, 2015, 2016, and 2017 Annual Conferences. The standard of both conferences and proceedings continues to rise under her guidance.
- Education Portfolio: is summarized above.
- Astronomy and Astrophysics Liaison: Prof. Patrick Woudt ensures that the communities are in close contact, and that the physics community provides good support to Astro projects and initiatives and *vice versa.* Particular attention will be given to support of the SA Gamma-Ray Astronomy Programme, SA-GAMMA.
- Conference Portfolio, WiPiSA and Division and Forum Portfolio: are summarized above.
- The Standards Committee is chaired by Prof. Johan Malherbe, and works hard, and often, to make sure Pr.Phys and Critical Skills visa applications are processed as fast as possible.
- The Disciplinary Committee, fortunately, has had no work at all. This is good.
- The Policy and Advisory Committee has been called in for advice on certain occasions.
- The Undergraduate Review Working Group has delivered as above. Many, many thanks to Dr. Sam Ramaila.
- The DHET Task Team work is described above.
- The Executive members, Prof. Frikkie Scholtz, Prof. Simon Connell, Dr. Malebo Tibane and Prof. Alan Matthews, have prompted, and taken, action throughout the year. Each has taken considerable responsibility. They cannot be thanked enough.

14. Executive Office

Staff

The Executive Office continues to grow in its achievements and responsibilities, and as agreed with DST, has been increased by 3 new staff members:

- Accounting Officer: Siphiwe Hlongwane
- Projects Officer: Nadanganeni Mahani
- Secretary: Lizzy Sathekge

In addition,

- Webmaster and IT: Roelf Botha and Juan Grey continue to provide effort above and beyond expectations, in particular in the INDICO systems multiple capabilities, in Conference capabilities, and in the publication of Proceedings.

There is considerable training, through courses and on the job, taking place in the Office.

Financial Sustainability

Co-funding for the DST support of the Executive Office is being vigorously pursued through conference services, membership services and project management. A 10-year strategic plan has been formulated.

Projects

Responsibility for Scarce Skills liaison is ably handled by Brian Masara. SAIP is registered under the Department of Labour.

The Executive Office has the following plans:

- on-line membership and Pr. Phys. application system
- updating of the Graduate Database
- review of the server systems
- continuation of the Physics Entrepreneurship Workshops with IOP
- development of Memoranda of Understanding with the SA Chemical Institute and the SA Crystallographic Society.

Governance

- VAT returns are up to date,
- The Financial Audit by Mazars has been completed, and
- Our new Accounting Officer has a working knowledge of the Public Finance Management Act and Treasury rules, under which the SAIP-DST contract falls.

Executive Officer

Brian Masara continues to carry strategy onward and upward, at the same time as achieving a great deal of proposal writing, project delivery, and management of the expanding Executive Office. He keeps the organizational memory of SAIP in both tacit and explicit form, and provides continuity as the Council members change. He is in continual touch with stakeholders, keeping them informed of SAIP developments, and bringing back valuable assessment of the scientific infrastructure environment. *Inqwele* – he is a wise and seasoned warrior. On behalf of Council, I extend my humblest and warmest thanks to him.

15. A note on the excellence of young South Africans

A week before the Conference, the CERN Beamline for Schools Competition 2015, in which 205 teams originally entered, as won by the team Accelerating Africa from St. John's College and Barnato Park High School. SAIP has sent letters of congratulation to the team.

16. Council Elections

Elections of Council members were held in 2015 and results will be announced at the AGM for the 2015-2017 term. Many thanks for Brian Masara, Dr. Malebo Tibane, and Roelf Botha. The Student Representative will be elected in 2015 under the guidance of the present representative, Zipho Ngcobo, and the Hon. Secretary.

To the Outgoing Council

I am gratefully astonished at how much has been accomplished by Council and the Office working together. I attribute much of this to the affectionate tolerance with which the Council members have treated each other, and the burning love of the subject which drives each of them.

SAIP is a professional, respected institute with immense reach, and immense outreach. Thank you.

Irvy (Igle) Gledhill

President, SAIP

3 July in The International Year of Light, 2015