

Physics Comment

A Southern African Physics Magazine

Can Science afford efficiency? Performance Management at SA Universities



A Quarterly Newsletter

Issue No 1

SAIP professional body

The South African Institute of Physics is now a professional body. What are the consequences? ([p.5](#))



Women in Physics Charter

The *Waterloo Charter for Women in Physics* gives recommendations to improve the situation for women studying physics and working as physicists. ([p.5](#))



The work of IUPAP

South Africa is one of the founding members of the *International Union of Pure and Applied Physics*. But what does the union do? ([p.6](#))

New PISA flagship

Forces at Wits, UKZN, Stellenbosch and the NLC are joined to develop photonic Quantum Communication applications. ([p.15](#))



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Editor's Note

“Not everything that can be counted counts, and not everything that counts can be counted”. This quote that is attributed by some to Albert Einstein and others to the sociologist [William Bruce Cameron](#), expresses the difficulty in quantifying important matters. For example, can and should scientific success be measured in terms of efficiency? Efficiency, is often defined as the extent to which resources are used to accomplish an intended task or achieve a projected goal. In this sense, the journey of Columbus that lead to the discovery of America, was absolutely inefficient, since it completely missed its intended goal to find a new passage to India. And so are many research efforts. As physicists we know, that in order to increase our knowledge of nature we often have to take diversions, it can be a very inefficient process. On the other hand, the measurement and management of research performance has become an important tool in the context of the cost-effective running of universities and research facilities and their corporatization. Can science prosper under such conditions? I would like to hear [your opinion](#) to this subject. In this issue of Physics Comment my colleague and coeditor, Prof Dave Walker, casts a critical view on a particular way of performance management at South African universities (p.12).

Also discussed in this issue is the new Professional Body status of the South African Institute of Physics (p.4), it contains reports on the work of South African Physicists in the International Union of Pure and Applied Physics (p.6) and many more news and views.

With best wishes
Prof Thomas Konrad

Caption of picture on frontpage: UKZN, Howard College Memorial Tower Building.

From: <http://commons.wikimedia.org/wiki/File:UKZN.jpg?uselang=en-gb>

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*Physics Comment is a journal 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.*



SAIP Council: Dr. I.M.A. Gledhill (President CSIR), Dr. M. Tibane (Honorary Secretary- UNISA), Dr A. Matthews (Treasurer - UKZN.), Prof I. Basson (UNISA), Prof. S.H. Connell (U. Johannesburg), Prof. M.M. Diale (U.Pretoria), Prof. T. Konrad (UKZN), Prof. K.K. Muller-Nedebock (U.Stellenbosch), Prof A. Muongo (U. Johannesburg), Z. Ngcobo (U.Zululand) , Dr.S.Ramaila (U.Johannesburg), Prof. F. Scholtz (NITheP), Prof. P. Woudt (UCT)

News from Africa

The SAIP Achieves Professional Body Status

Simon Connell (former SAIP president), Igle Gledhill (SAIP president), Brian Masara (SAIP Office, Pretoria).

SAIP is constituted according to Common Law as a Voluntary Association with non-profit organisation (NPO) status, where the SAIP Constitution serves as the legally defining document (containing its main purpose and objectives, its membership and governance structures and procedures, and the rights and duties of the organisation and its members and office-bearers).

A new role for Professional Bodies was introduced by recent legislation (the National Qualifications Framework Act of 2008) in terms of the National Skills Development Strategy III. This involves increased standing and responsibilities for Professional Bodies to:

- promote an enhancement of the development of skills without compromising quality,
- form a vital part of the data gathering on the supply and demand for skills,
- play a role at broadening both access to and sites of training, and
- acquire and develop their role in standard setting, programme accreditation and professional registration.



Simon Connell

This was communicated by the Department of Higher Education and Training (DHET) during a series of road shows in May 2011. Council saw participation as important in order to fulfil our mandate as the Voice of Physics, and as the voluntary association which looks after the health of the discipline. Participation would ensure sustainability growth whereas non-participation could lead to marginalisation.

A professional designation as professional physicist...

Autonomy would be ensured by a diversified funding model. The matter was also well aired to the membership through electronic media and discussions during the AGMs in the years from 2012-2014. As required for Professional Bodies registration,

the SAIP amended its Constitution and By Laws to reflect

- a Professional Designation as Professional Physicist, reflected by P.Phys as a post-title,
- a new Code of Conduct and an associated Disciplinary Procedure, and
- a system for Continuous Professional Development (CPD), necessary to maintain the Professional Designation.



Igle Gledhill

These amendments became active by unanimous consent at the AGM in July 2014. The updated documents may all be found on the [SAIP website](#).

...a new code of conduct...

The Professional Standards Committee has been constituted to consider voluntary applications for the Pr.Phys Professional Designation. Its members are the SAIP President, Igle Gledhill, the SAIP Secretary, Malebo Tibane, the Chair of the Awards Committee, Kristian Muller-Nedebock, and two members appointed by Council. One is Johan Malherbe (Chair), who has both experience and wisdom in such processes after many years as a member of the SA Council for Natural Scientific Professions, and one is Simon Connell, as Past President and an architect of the Professional Bodies registration. One additional member may be appointed if necessary, and this position has been left open for the present. The Disciplinary Committee is also in place and it consists of Johan Malherbe (Chair), Igle Gledhill, Mmantsae Diale, Malebo Tibane and Brian Masara.



Brian Masara

...and a system for continuous professional development

On 3 March 2015, the South African Qualifications Authority (SAQA) Board approved the recognition of the South African Institute of Physics as a Professional Body and registered its Professional Designation as prescribed in the National Qualifications Framework (NQF) Act 67 of 2008.

Pr.Phys demonstrates the highest standard of professionalism, competence and commitment to keep pace with advancing knowledge in the field of physics it will give the holder a professional standing and

recognition by the science and technology community and society in general.

Pilot registration for Pr.Phys. opened at the 2014 Annual Conference leading to 12 successful candidates qualifying to use the Pr.Phys as a post-title. The process has been opened for continuous registration, and another 14 applications are in progress.

The application form for the Pr.Phys. Professional Designation is available on this [SAIP web site](#). The Professional Physicist Certification must be renewed on application every five years.

The Professional Standards Committee is also able to process requests for letters supporting applications for critical skills visas and for permanent residence. So far SAIP has acted on one such application.

SAIP now has the highest formal professional recognition through two Departments: DST, though a Voluntary Association member of the South African Council for Natural Scientific Professions (SACNASP), and DHET, through SAQA. Members of SAIP are strongly encouraged to also join SACNASP. According to the Natural Scientific Professions Act 27 of 2003, this is a statutory requirement for those who are involved in the professional practice of the discipline of physics, which is broader than consultancy.

The SAIP was a pilot case for SAQA, in that it is a voluntary association related to a discipline. The SAIP is therefore one of the very first disciplines to achieve this status in South Africa.

The professional body status is seen as very important to the ability of the SAIP to pursue the health of Physics, and to develop the suite of projects through which the SAIP brings value to its members. As an example, the states of Basic and Undergraduate teaching and learning are identified currently as the most important challenges for our discipline. The SAIP has engaged on developing a national Teacher Training project, and the Review of Undergraduate Physics has been completed. It became very clear at the 26/27 March 2015 meeting on implementation of the latter that Professional Body status will be extremely helpful in partnering with DHET and university authorities to improve the quality of BSc Physics degrees in South Africa. For both of these projects, the statutory status provides added authority to our community, and thereby improves the chance of a successful outcome.

Critical Skills Visa Letter

Brian Masara, SAIP office, Pretoria

The South African Institute of Physics is now a SAQA registered professional body, hence it can provide critical skills letters required for the application of a Critical Skills VISA and Permanent Residence Permits to Registered Professional Physicist.

An application for a Critical Skills Work Visa has to be accompanied by proof that the applicant falls within the critical skills category and the following;

1. A confirmation, in writing, from the professional body, council or board recognised by the South African Qualifications Association (SAQA), in terms of Section 13(1)(i) of the National Qualifications Framework Act, or any relevant government department confirming the skills or qualifications of the applicant and appropriate post qualification experience.
2. If required by law, proof of application for a certificate of registration with the professional body, Council or board recognised by SAQA in terms of Section 13(1)(i) of the National Qualifications Framework Act.
3. A proof of evaluation of the foreign qualification by SAQA and translated by a sworn translator into one of the official languages of the Republic.

SAIP is recognised by SAQA and can provide you with the confirmations you need to comply as mentioned in requirements 1. and 2. above.

Register as a Professional Physicist with SAIP

Brian Masara, SAIP office, Pretoria

The SAIP is inviting its members to register as Professional Physicists (Pr.Phys) with SAIP. The short abbreviation for the designation will be Pr. Phys.

A member registered with SAIP as a Professional Physicist can use the letters Pr.Phys after their name e.g. George Brown Pr.Phys

[DOWNLOAD THE Pr.Phys APPLICATION FORM HERE](#)

Who can apply?

Physics is a basic science that is a basis for all science and technology disciplines. This results in its graduates working in every sector imaginable. Therefore we must cater for a wide range of industries and economic sectors. Hence any physicists who

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graduated with at least Physics Honours Degree working in either; industry, commerce, government, academia, research, theoretical physics, experimental physics, and uses physics skills and thought processes in their job / career.

A person first has to qualify to be an SAIP Ordinary member before they can be registered as a professional physicist.

Check the SAIP constitution regarding the criteria here: [SAIP Constitution](#)

This designation will represent the highest standard of professionalism, competence and commitment to keep pace with advancing knowledge in the field of physics. It is hoped this designation will give a professional standing and recognition of physics by the South African society.

Justification

Academic qualifications are only the beginning of a career in physics and its

- When competing for a job the designation will distinguish one from other applicants with similar qualifications but no professional designation.

Benefits for employers

- Supports the recruitment process many recruiters these days want to know if one has a professional designation.
- Can be used as a criteria for promotion, skills and salary benchmarking.
- It demonstrates that someone who possesses this designation believes in professionalism, continuous skills development, belonging to a professional body and acceptable ethical standards.

The Waterloo Charter for Women in Physics

by Aletta Prinsloo, UJ, Johannesburg

Women have participated in Physics



Participants of WiPiSA launch in Limpopo Oct 2014

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. P.Phys demonstrates a commitment to maintaining competence, continuing your professional development and abiding by an acceptable code of conduct.

Benefits to physicist

- The certification as a Professional Physicist will be an important addition to a physicist's personal credentials.

through history and have made many significant contributions to the field. However, data gathered by the IUPAP working group on Women in Physics (WIP) indicate that the percentage of female physicists remains low. It is becoming clear that ability is not the sole contributor to a successful scientific career. It has become evident that success is strongly influenced by social and cultural factors that also need consideration.

The search for excellence that unites all scientists can be maintained and enhanced

by increasing the diversity of its practitioners. Great discoveries have always thrived on cross-cultural diversity. The attainment of such diversity needs revised criteria for judging excellence, free of cultural perceptions of talent and promise.

Excellence can be enhanced by increasing the diversity

Considering the data on the relative numbers and career histories of women and men widespread discrimination is evident. Although some of these discriminations could be subtle rather than explicit, it still leads to a working environment that not only discourages and distresses women, but also alienates them from the field. It is proposed that ultimately, such discrimination can only harm the profession.

Widespread discrimination is evident

In order to enable women to succeed within the existing structures of physics the WIP working group believes that IUPAP should assume responsibility for implementing strategies that will assist in addressing diversity in the field of physics. It is against this background that the Waterloo Charter for Women in Physics was formulated at the fifth IUPAP International Conference for Women in Physics organized in Waterloo, Canada from August 5-8, 2014. The content is based on the rubrics of the Baltimore Charter and the Pasadena Recommendations previously set up by the American Astronomical Society, and is also directed by the principles stated in the JUNO project.

The Waterloo Charter gives the following recommendations:

- The setting of serious goals for achieving diversity in all aspects of the physics profession.
- Criteria used in hiring, assignment, promotion and awards should be broadened. There are several issues that need to be considered here, including the fact that the tenure-track hiring practices may work against women; as well as the problem that career advancement and recognition seem to be lacking for females. In addition, institutional policies that are friendly to women need to be developed and mentoring should be encouraged.
- Strong action must be taken to end sexual harassment. Cultural factors should be addressed and statistical information should be considered as most important in order to determine whether the ac-

tions taken have remedied the problems identified.

- Gender-neutral language and illustrations are important, not only in documents and discussions, but also by those who represent physicists to the public.
- Physical safety should be addressed, making it possible for everyone to work at any hour, in any place, as necessary.

Many prominent research institutions already adopted recommendations regarding equality and diversity, including the Large Hadron Collider beauty (LHCb) management. Formal recommendations from their equality and diversity taskforce aim to proactively improve the gender balance, and more generally diversity, of the collaboration. ATLAS is apparently now considering duplicating these recommendations.

Implementing the recommendations from the Waterloo Charter will in itself not lead to a perfect world, but it might result in a substantially better working environment for all. For this reason it is important that the Waterloo Charter be promoted by the South African Institute of Physics through the appointment of a champion and by getting it adopted at various institutions in South Africa.

News from WiPiSA: planning for a new website and funding opportunities

Emanuela Carleschi (University of Johannesburg)

WiPiSA would like to launch its new and revamped website by the end of June 2015. Our goal is to make it a meaningful platform of communication, where women can share stories and gather relevant information, and where they can also share research interests and make contacts for future research collaborations.

We therefore invite all of you, women in physics out there (please note: at any level of study/work, from undergraduate to academic, research and industry staff members), to email us your stories, your research profile and interests, your experience on the working environment and so on, so that we can post all of it on our new website. Please email your stories and photos directly to Emanuela: ecarleschi@uj.ac.za.

Moreover, we would like to take this chance to remind all readers about the other opportunities that WiPiSA offers:

1. WiPiSA Call for projects 2015: WiPiSA will provide an overall maximum amount of R30 000 to fund projects to

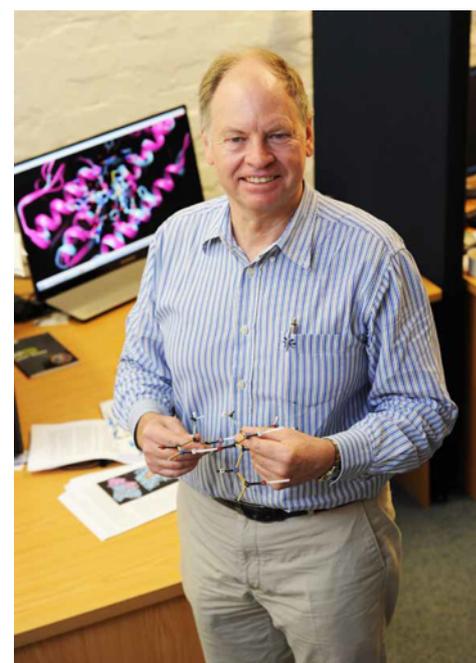
be carried out in 2015. The deadline for submission is 30 April 2015. Please check the WiPiSA webpage on the SAIP website to retrieve the formal call for proposals, or contact Emanuela: ecarleschi@uj.ac.za for queries.

2. Annual WiPiSA lunch: If you are willing to organize a women in physics lunch in your department/research centre, please be reminded that WiPiSA will sponsor your lunch with an overall amount of R3 000. Please email the WiPiSA Chairperson, Prof. Aletta Prinsloo (alettap@uj.ac.za) for more information.

IUPAP Commission on Biological Physics

Trevor Sewell, University of Cape Town

Professor Trevor Sewell from the University of Cape Town has been elected as a member of the International Union of Pure and Applied Physics (IUPAP) Commission on Biological Physics and will serve until 2017. IUPAP plays an important role in promoting international cooperation in physics and encourages research and education. South Africa has played an important role in the organization of which it was a founder member almost a century ago. In the case of Biological Physics the need of South Africa to receive assistance from the international community is greater than its capacity to contribute. Our problems in the areas of infectious diseases and harsh agricultural conditions, however, create a



Prof Trevor Sewell developing structural biology

rich environment for discovery and for the implementation of novel, cost effective, environmentally appropriate physical techniques for measurement and remediation. A great deal needs to be done locally to develop research and education in biophysics. Much of this depends on infrastructure that currently does not exist on our continent – finding ways to access appropriate infrastructure abroad and obtaining assistance in establishing local resources are clearly two important reasons for participating in major international organizations.

Trevor Sewell is a graduate of the Physics Department at University of the Witwatersrand and the Crystallography Department at Birkbeck, University of London. He has worked at UCT since 1980 developing the field of Structural Biology using combinations of X-ray crystallography, electron microscopy and molecular modeling, putting the discipline firmly on the map in South Africa. He is currently Director of UCT's Centre for Imaging and Analysis that offers facilities in protein preparation and crystallization, protein crystallography and cryo-electron microscopy. He has worked on a number of proteins including some that are potential drug targets in *Mycobacterium tuberculosis*.

"New developments in the field have shifted the goalposts," Sewell cautions. "It is no longer acceptable to just visualise the structures. We have to explain how they work."

The work of IUPAP Commission on Physics for Development

Mmantsae Moche Diale, University of Pretoria

It is great news to announce to all the SAIP community that we are represented in Commission 13 (C13) of the International Union of Pure and Applied Physics (IUPAP), by Mmantsae Diale. C13 is a commission focusing on World Physics for Development, established by the IUPAP in 1981. C13 has been mandated:

- to help in appropriate ways the improvement of the conditions of physics and physicists in developing countries;
- to propose and, if appropriate, support initiatives to promote the contribution of physics to industrial development;
- to collect and distribute relevant information on opportunities for Physics Development.

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There are different ways to achieve the said aims, including organization of conferences, free circulation of scientists, especially in assisting in travel and conference attendance, encouraging the award of medals and certificates of excellence in specific fields in developing physics community, and support publication of newsletters, circulars, books, journals and handbooks which may have been written and developed in poorer countries.

Physics for development is expected to maintain a liaison with other commissions like International Union of Scientific Unions (ICSU) with a view of collaborating in events that benefits the scientific community. Physics for development is expected to keep close relationship with other commissions like Physics Education so as to ensure suitable inputs from each field into the wider physics community.

C13 commissions had five conferences in 2014, of which four were all in Africa. Since 1996, most of the meetings of C13 have been taking place in Africa. This place a higher demand on the member of the commission that funds must be raised to have more meetings worldwide without losing momentum for the continent.

The chair of the commission is Sandro Scandolo (Trieste), Vice-chair is Gui Lu Long (China), Secretary is Dipali Bhatt-Chauban (IOP), and ten other members of which SAIP/South Africa has a representa-



IUPAP Physics for Development member Prof Diale

tive. The commission had an annual meeting in 2014 at ICTP, Italy and the report can be read from the website of C13 commission

<http://iupap.org/commissions/c13-physics-for-development>

NSTF-BHP Billiton Awards Share 'n Dare outreach programme

Prof Azwinndini Muronga visits Limpopo

Deidre Lotter, National Science & Technology Forum, Reprinted with kind permission of the National

Science & Technology Forum (NSTF) reprinted from its Newsletter

As part of the NSTF-BHP Billiton Awards [Share 'n Dare outreach programme](#), Prof Azwinndini Muronga, associate professor at the University of Johannesburg and director of the UJ Soweto Science Centre, visited three schools in Limpopo, as well as the University of Venda, from 28-29 January 2015. (The editor: BHP Billiton is an Australian mining company). Prof Muronga was accompanied on his visit by Daisy Ravhengani of the NSTF.

[Prof Muronga](#) teaches and pursues research, while championing science development. He is the winner of the 2013/14 NSTF-BHP Billiton Award for his outstanding contribution to science, engineering and technology innovation through science communication for public awareness over the last five years.

Makakavhale Secondary School, where Prof Muronga matriculated, was the first stop on the visit. The Chief of Lwamondo village, where the school is located, welcomed the visitors, after which Prof Muronga addressed the Grade 12 class. He emphasised the importance of obtaining good results in matric and the impact it has on university applications. He advised learners on how to study successfully to prepare themselves for their first year at university.

After the talk with the Grade 12 students, the Chief and the elders that accompanied him joined learners from all grades and staff members at an assembly, where the Chief expressed his gratitude to Prof Muronga and the NSTF for their visit. Ms Ravhengani explained the purpose of the Share 'n Dare Programme to the learners,



Prof Muronga pictured with learners and staff at Makakavhale Secondary School

and told them about the [science bursaries website](#), a free service from the NSTF that



Prof Muronga at Makakavhale Secondary School

acts as a “one-stop shop” for careers and bursaries in science, engineering, and technology.

In his address to the assembly, Prof Muronga encouraged learners not to give up, no matter the circumstances. He told them about the difficulties he went through in his time as a learner. In closing, he provided background to the NSTF-BHP Billiton Awards and his research, and encouraged learners to aim for a mark of 50% or more in their grades.

University of Venda

The next stop on the visit was the University of Venda, where Prof Muronga talked to the students about the importance of their first year of study. He shared his own experiences of his first year and how he managed to stay focused, and other details of his academic journey, his research and the work he is doing at the moment.

In the afternoon Prof Muronga visited Lwamondo Secondary School, where he addressed three Grade 12 classes and one Grade 11 class. On 29 January, he concluded his Limpopo tour with a visit to



Students listening attentively to Prof Muronga at the University of Venda



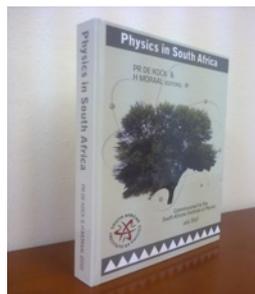
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Tshilogoni Secondary School, in Nzhelele, where the NSTF visitors were warmly welcomed by the headmaster, who expressed his sincere gratitude that his school was chosen for a visit.



Prof Muronga at Tshilogoni Secondary School

Purchase the book Physics in South Africa



Order from SAIP Office!

The book is currently available from the SAIP Office in Pretoria in hard copy and currently priced as

- a) Hard covered Copy R500 per copy
- b) Soft covered Copy R250 per copy

Courier and postage fees is for the customer's account To order your copy please Email or Phone +27 12 841 2655/2627

JOIN SAIP MEMBERSHIP

Brian Masara, SAIP office, Pretoria

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 for a wide range of industries and economic sectors.

SAIP membership includes any physicists who graduated with at least physics related degree working in either; industry, commerce, government, academia, research, theoretical physics, 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 your professional development from activities such as conferences, schools and workshops and abiding by an acceptable code of conduct. Membership of a professional society is an important addition to a physicist's personal credentials for example when competing for a job membership of professional society will distinguish one from other applicants with similar qualifications but no professional affiliation.

What members say about SAIP membership



Dr Igle Gledhill - It's useful to have a professional home that is not an employer or an alma mater. I came back from four years in the USA and switched fields at the same time. Funnily enough, SAIP is home – the banquet is a hoot, the conferences keep me up to date, the Institute is serious about science in South Africa and gets things done, and my colleagues keep me on my toes.



Dr Daniel Moeketsi - SAIP provide a platform to showcase physics research progress and direction in the country and expose students to many career opportunities both in public and private sector. I encourage postgraduate students to subscribe for SAIP membership and actively participate in the organisation's annual activities.

Membership benefits

- I. Stay informed - News flashes and alerts to 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.
- II. 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'll make important new contacts and forge lifelong professional relationships by getting involved in a specialist group.

- III. Save Money - You'll receive discounted rates for SIAP conferences, and have the benefit of paying affiliate membership fees for IOP membership.
- IV. Employment opportunity information - Job advertisements will be displayed on our new website and mailed to members from time to time.
- V. Access to current information on sources of funding grants and scholarships - Exclusive service provided to our members via a direct email system.
- VI. Scientific meetings - The annual conferences and workshops provide learning opportunities for different specialisation areas and varying degrees of experience.
- VII. Especially for the global physics community - You'll have the opportunity to be partake in events organised by the SAIP for the Physics community in South Africa as well as Africa: developmental workshops, schools and conferences.
- VIII. Additional resources - Your membership privileges also include information and guidance when applying for and acquiring visas to study, participate in scientific meeting and research opportunities in South Africa and abroad. There is also an exclusive member-only area on our website.
- IX. Career guidance and resources - Career assistance is provided to all members to find their career path in industry or academia.
- X. Opportunities to win awards for excellence - SAIP recognises contributions to physics in SA by awarding two different medals and various student prizes at the annual conference.
- XI. 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>

Free SAIP Membership for 3rd Year and Honours Physics Students

Brian Masara, SAIP office, Pretoria

The SAIP Council passed a resolution to extend free membership all 3rd Year Physics students and all Honours Physics Students. In order for 3rd year and honours students to be given free SAIP membership they must do the following

1. Approach their supervisor or physics head of department and ask them to send a request to SAIP
2. The HoDs / Supervisors can choose to make their students free SAIP members
3. The supervisor or HOD can send an email with the students' names and email address to SAIP on info@saip.org.za

The 3rd year and honours students will have the following benefits

- Receive all SAIP electronic communication such as the Physics Comment magazine and adverts for scholarships, conferences and jobs.
- Attend the SAIP annual conference as student membership rates

This subscription will be valid for 1 year from January to December only hence for honours students they can ask their supervisor/HoD to renew it every year in January.

SA Physics Graduates Database

Brian Masara (SAIP office, Pretoria)

If you have a degree in physics and you are currently working, studying or unemployed and resident in South Africa, or have studied physics in South Africa we kindly request you to sign up and give us your personal statistics. We need you! The statistics we collect, with your help, will be used to influence legislation, decision-making and all matters related to physics funding required for training more physicists.

Read more details [here](#) on confidentiality and great benefits of signing up and updating your details

To register click here .For enquiries contact SAIP Office at info@saip.org.za

WiPiSA Departmental Lunches Funding Opportunity

Aletta Prinsloo, University of Johannesburg

Two of the main objectives of WiPiSA are to

Encourage and stimulate an interest in girls and women to study physics

Support girls and women to work in physics-related careers and assist in removing/overcoming obstacles and barriers for girls and women in their studies and at workplace.

To meet this objectives we initiated an idea to have departmental lunches across Universities within South Africa. The lunch activity is expected to bring women in physics together; academics, those in leadership roles and students (both undergraduates and postgraduates) to enjoy a meal together while encouraging and stimulating interests in others to study physics, networking and talking about some challenges they are facing as women in physics.

WiPiSA will provide a funding of R3000-00 only for your institution to organize the lunch. We therefore request you to help us accomplish this goal, or forward the name and contact information of the representative from your department to facilitate this activity. We would appreciate if the lunch event can be held before the end of November 2014 as this will help us to compile a report. WIPiSA expects you to send us:

A short report about the event (venue, number of attendees, activities, etc).

The outcomes of the event (students were motivated, links established, etc).

Few event pictures.

Please do not hesitate to contact me at alettap@uj.ac.za for further enquiries.

Obituary Prof Emeritus Eddie Baart

by Peter Clayton, Rhodes University, Grahamstown

It is with sadness that we inform you of the death of Professor Emeritus Eddie Baart, a respected teacher, researcher and intellectual leader of the Rhodes community.

Professor Baart died in the early hours of the 23. December 2014 in the Aurora Hospital in Port Elizabeth.

Eddie Baart had a long history with Rhodes University, enrolling as a student in 1951. He majored in Physics, Mathematics and Applied Mathematics, and graduated with a BSc with distinction in 1953 and a BSc(Hon) also with distinction in 1954. He obtained a Doctorate in Nuclear Physics at Liverpool University in 1959, before returning to Rhodes University as a Senior Lecturer in the Physics Department in 1960 after a brief period as a geophysicist in Rhodesia. He was appointed Professor in 1969 and succeeded Professor Jack Gledhill as Head of Department in 1984, a position he held until 1993.

Professor Baart built up the very successful Radio Astronomy Research Group in the Physics Department. His involvement dates back to the time when he was a member of the group appointed in 1960 to restart radio astronomy after the work on solar emissions by Prof Stack-Forsyth was concluded. Prof Baart became a leader in this venture. Their major achievement was a unique radio survey of the southern skies, using the 26m radio telescope at Hartebeesthoek near Pretoria. It is fair to say that these origins of radio astronomy in South Africa here at Rhodes University ultimately led to the winning of the bid for hosting the Square Kilometre Array (SKA) telescope in 2012.

Prof Baart was a rated researcher under the programme of the Foundation of Research Development, the predecessor of the National Research Foundation. Between 1971 and 1991 he was a member of the Advisory Board of the South African Astronomical Observatory and served as President of the Astronomical Society of South Africa in 1981 and 1982. Professor Baart also published numerous papers throughout his career.

His publishing work continued into this year, in the form of a chapter written by him on contributions at Rhodes University to South African physics, for a book on the History of Physics in South Africa, published by the SA Institute of Physics.

With the current crisis in education in South Africa topical, it is worth noting that Rhodes University was one of the earliest institutions to take Physics Education seriously as a legitimate research area. Against the grain, Prof Baart took the courageous route of using practical research findings directly in his teaching methodology and testing them. Rhodes became known for the quality of its Physics teaching and its high level of interaction with the students. For his efforts in teaching, Prof Baart was recognised with a Carnegie Fellowship in Physics Education and awarded the first Vice-Chancellor's Distinguished Teaching Award in 1991.

Prof Baart served Rhodes in an extensive range of capacities. He was a Senate representative on Rhodes University Council for 21 years (1973 – 1994), served as the Dean of Science in 1976 and 1977 and between 1980 and 1982. He also acted a Pro-Vice-Chancellor on numerous occasions. Records show that Prof Baart founded the Electronic Services Unit, which now serves the whole University. He was Chairman of Computer Steering Committee for many years during which time there was a significant expansion of the network at Rhodes University. These were the formative years of the Internet in South Africa and we are proud to say, Rhodes University did the pioneering work. For many years, Professor Baart was in charge of equipment for lecture theatres and helped introduce the University to photocopying, offset-litho printing, overhead and other projectors and word processors and spreadsheet packages for academic departments and the Library. He acted as a Sub-Warden, House Warden and Hall Warden, counseling and mentoring generations of students. Prof Baart was also the founding Chairman of the Rhodes University Bequest Association.

However, it was not all work for Eddie as many of his colleagues recall. He played rugby for Rhodes as a student and excelled at squash. He became the Administrative Secretary of the local Shakespeare Society, was involved in amateur drama at Rhodes well before there was a Drama Department, and played many leading parts in productions of the Grahamstown Amateur Dramatic Society (GADS). Mixing fun with work, he put in considerable time and effort in demonstrating “The Fun of Physics” as the “Mad Professor” to school children of all ages, at schools, at SciFest and at the Albany Museum. Before and since retirement Prof Baart made a name for himself and brought considerable respect to Rhodes University for his expertise as “Expert Witness” in cases involving the physics of motor and other accidents.

In October this year, Professor Baart was acknowledged by his close colleagues in the Physics Department at their year-end function, for his long and influential service to Physics at Rhodes. Many of the processes and values within Teaching and Learning and research processes in the department carry evidence of his leadership and influence.

Earlier this month, Professor Baart was honoured with the Distinguished Old Rhodian award in recognition of his exceptional contribution to Rhodes University and to the discipline of Physics.

Professor Baart is survived by his wife, Janine, and his extended family. He contributed much in his life, with enthusiasm and good humour, and will be remembered with respect and fondness.

Comment of Justin Jonas (Chief Scientist SKA): If I were to add anything to Peter's text it would be that Eddie was always guided by what was best for the system, and not self-interest. This is rare in the university environment. His wise counsel was key to the development of both Rhodes and astronomy (all wavelengths) in South Africa.

Bureaucrats, Bean Counters, and Bungles

A. D. M. Walker, Editorial Board, Physics Comment

“If people were capable of estimation and simple calculation, many obvious inferences would be drawn (or not), and fewer ridiculous notions would be entertained.”

John Allan Paulos, *Innumeracy: Mathematical Illiteracy and its Consequences*

There are few threats more alarming than a bureaucrat armed with a numerical index. Over the last few decades a number of statistical tools have become available to aid in the evaluation of research performance. Apart from that old standby, the number of publications, we have indices such as citation count, Hirsch index, impact factor of a journal, and various other alternative metrics to measure scientific impact. All these, used with appropriate intelligence, can be very useful in evaluating the performance of individuals, groups and institutions.

For a number of years now the simple publication count (in journals on an approved list) has been an important component of the university subsidy formula operated by the Department of Higher Education. Its shortcomings as an index, emphasizing quantity over quality, are recognized, but over a whole institution it is a reasonable first approximation.

Applying such an index uncritically to assess the worth of an individual is another matter. In a number of institutions the publication count is used, often with other measures, to assess the research productivity of individuals. In particular, the NRF has been wrestling with how to assess individuals who work in large teams.

Commonly in South Africa, to provide a numerical index of research productivity, an author is credited with a fraction of a multi-author paper. For example, a three-author paper generates one third of a publication to each of the collaborators.

Physics, in more and more sub-disciplines, is now “big science”. In particle physics, astrophysics and Astronomy, space science, and many other fields papers with a very large number of authors are the norm. South African science policy has eagerly embraced big science in its enthusiastic support of the SALT telescope, the SKA, and the space programs of the South African National Space Agency. Significant participation by South African physicists in the huge ATLAS experiment at CERN, is made possible by a (relatively minute) South African contribution to the ATLAS budget. This experiment involves more than three thousand physicists from all over the world. The convention adopted by ATLAS is that all published papers are authored by the entire ATLAS team.

One South African ATLAS participant is Dr Sahal Yacoob who, after a period at CERN, was a few years ago appointed to a post in the School of Chemistry and Physics at the University of KwaZulu-Natal. As a member of the ATLAS team he is an author on over 300 papers over the last 5 years. His total number of citations is about 13000. At face value, using data from the World Wide Web his Hirsch index is 54, placing him well above the value of 45 that Hirsch suggested would be typical of a member of the USA Academy of Science, and stratospherically above the value 18 typical of a full

professor at a good research university. Dr Yacoob would be the first to argue that none of these indices are the least bit relevant to actually evaluating his performance. It is clear that they are simply ill-adapted to the practices of the ATLAS team. Readers who follow the cartoon strip *Dilbert* in Business Report will have seen a recent strip in which the CEO informs Dilbert and his colleagues that “Studies show that tall people earn more than shorter people. So instead of doing performance reviews this year, we'll just measure your height and pay accordingly. And, of course, Alice will earn 10% less than the men. I think that's a law.” Using the usual bibliometric indices to evaluate Dr Yacoob's academic performance makes as much sense as using his height (about average) or his gender (male).

There is just one bibliometric measure on which Dr Yacoob does not score well. On publication count, as shared between number of authors, we can calculate that the value of each paper, divided by more than three thousand and rounded to 1% accuracy, is zero. Dr Yacoob's publication count is zero (as would be the value for any member of the ATLAS team).

In 2010 the Senate of the University of KwaZulu-Natal determined “norms” for the academic evaluation of staff performance. They were: (i) Professors (Full and Associate) should generate 120 productivity units (PU) per annum, (ii) Senior Lecturers 90 PU and (iii) Lecturers 60 PU. One single author paper generates 60 productivity units. There are also contributions from supervision of research students, and other research activities. The norms were arrived at by considering performance across all universities in South Africa without any reference to variations between disciplines. This immediately became the basis for performance evaluation of staff. If such norms had been set for the discipline of physics, it would have been found that the performance of South African physicists (with UKZN being typical) was consistent with that of American and Australian physicists (Matthews 2012).

It was apparent to Dr Yacoob and others that, given the publishing conventions in their fields, such conditions could not be met. Over a period of two years he negotiated with the authorities to attempt to resolve the problem in line with the instruction in the University performance manual “The kpa's [key performance areas], objectives and measures that form part of the performance agreement must be mutually agreed on between line manager and employee. Where there is non-consensus, the second line manager should be asked to resolve the dispute” (UKZN no date). The ultimate result was that those responsible refused to budge: PUs were set in stone. Dr Yacoob was ordered to sign the performance agreement. After an initial refusal he signed a version modified in consultation with his immediate line manager. It was not enough. A disciplinary action was brought against him asking for dismissal. The result of the hearing was that he was found guilty on one of three charges, refusing to obey the instruction of his line manager, with the sentence that he should receive a final letter of warning. He appealed. The authorities counter-appealed again asking for dismissal. The original sentence was upheld.

It is not our purpose to criticize the disciplinary process or its result. Whether the procedure was fair, or the sentence appropriate is a matter soon to be determined by the CCMA [. It is quite possible to be properly and fairly found guilty of breach of a bad law. This law – the requirement that all academics must meet the same performance criteria rigidly applied – is a very bad one. One feels the same incredulity as Mr Bumble: “ 'If the law supposes that,' said Mr. Bumble, squeezing his hat emphatically in both hands, 'the law is a ass — a idiot. If that's the eye of the law, ... the worst I wish the law is, that his eye may be opened by experience — by experience.' ”

The result of the whole sorry story is that UKZN is likely to lose the services of Dr Yacoob and another university gain them. The morale of others affected in the same way but to a lesser degree has been substantially lowered.

Assigning a number to something is an algorithmic process not a qualitative assessment. An index is an indicator not a measure. Indicators arrived at by statistical means cannot be applied to outliers in a distribution. The identification of excellence is the identification of outliers. Once hopes that all involved have learned by experience.

What should we conclude? Our view coincides with that of [Bouyssu](#) (2013) who, in a lecture presentation on the uses of bibliometrics concluded that bibliometrics

- should be used with much care;
- should not be in the hands of laypersons,
- should not be entrenched in formal rules, and
- can be useful if used together with careful and impartial peer review.

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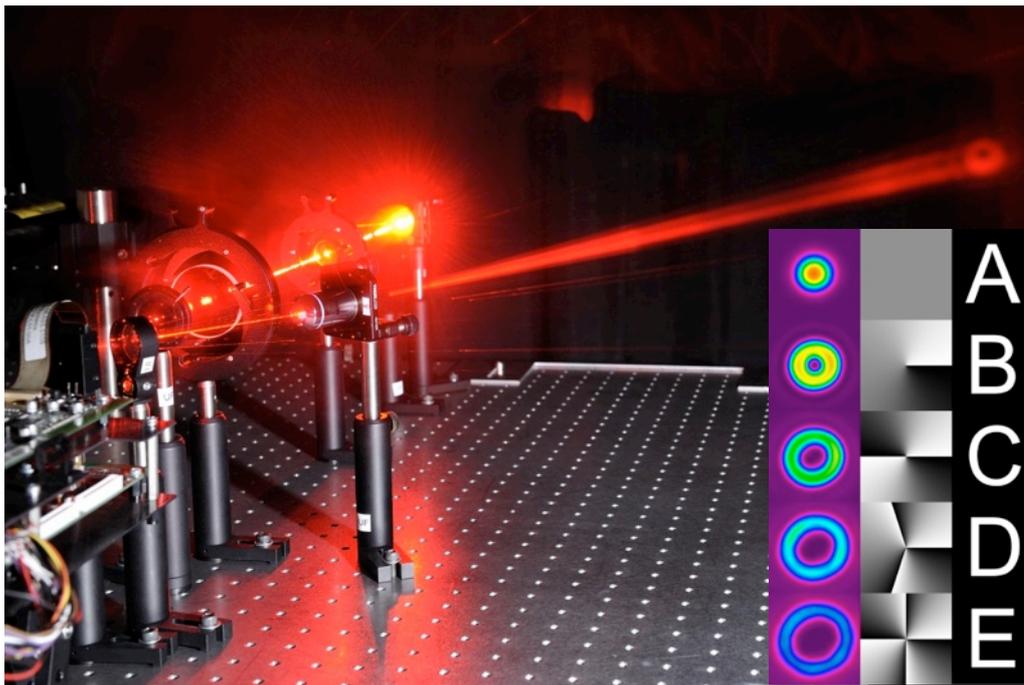
Quantum communication flagship project launched

Andrew Forbes, University of the Witwatersrand, Johannesburg

A new quantum communication flagship programme has just been launched by the Photonics Initiative of South Africa (PISA). A consortium of three institutes comprising the University of the Witwatersrand (Wits), the University of KwaZulu-Natal (UKZN) and the Centre for Scientific and Industrial Research (CSIR) will attempt to demonstrate a quantum link using high-dimensional quantum states in both free space and in fibre. A fourth partner, the University of Stellenbosch, will look into classical propagation of light in fibres. The project will be led by Prof. Andrew Forbes (Wits) with core team members of Prof. Thomas Konrad (UKZN), Prof. Francesco Petruccione (UKZN) and Dr Stef Roux (CSIR), and has initial funding for two years.

Background

In 2011 the first entanglement experiment was established in South Africa and quantum correlations were observed on the continent for the first time (see further reading). By using the spatial modes of light, Forbes and his team demonstrated high-dimensional entanglement in a Hilbert space of dimension 25. In parallel to this the team at UKZN have pioneered quantum key distribution with polarisation states of light.



Information can be encoded in the angular momentum of light. Inset: transversal intensity distribution (left) and phase dependence (middle) of light modes carrying different angular momenta.

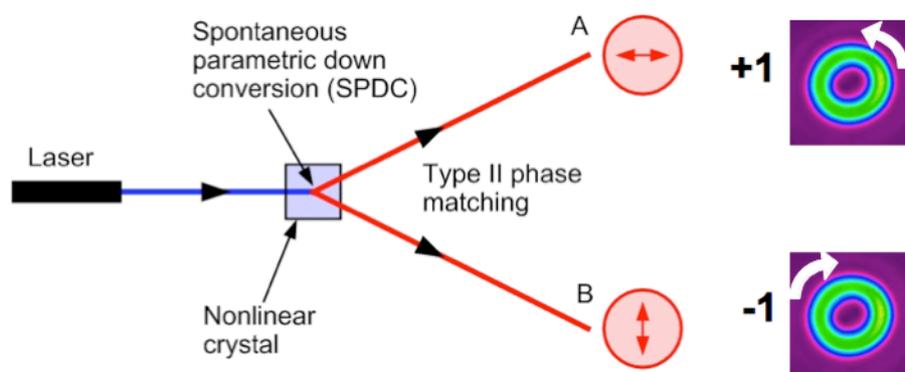
Now the expertise is combined to demonstrate a high-dimensional communication link, initially through free space (the atmosphere) but later through multimode fibre too.

The idea is that since spatial modes form an unbounded set, higher dimensional state spaces can be realised with them. The higher the dimensionality of the entanglement, the more information can be packed into each photon. This approach improves the security and bit rate of the link. The challenge is to preserve the entanglement over a long distance: entanglement is fragile and is easily disturbed when the entangled photons pass through a turbulent atmosphere.

A major theoretical challenge in this project is to model this behaviour and propose new states that are more robust to this disturbance. The experimental challenge is then to realise these desired states, and to detect them over a long distance link.

PISA

South Africa has recently launched the Photonics Initiative of South Africa (PISA), which aims to position South Africa as a globally competitive player in photonics. The initiative follows other countries with similar national strategies for photonics, including the USA, Canada, UK, and the European Union. This signifies not only the economic importance of photonics, but its potential to address many of the current ‘grand challenges’ for industry globally and in South Africa. Photonics has been defined as ‘the science of harnessing light’ and includes ‘the generation, detection, guidance, manipulation and amplification of light, and its utilisation for the benefit of mankind’ [adapted quote from Pierre Aigrain]. Photonics applications are pervasive in all branches of modern science and engineering: from laser eye surgery, to laser gyroscope based navigation, to light activated drug activation, to spectroscopic identification of unknown chemicals, the high definition television screens enabled by photonic materials, to DVD read heads, and the uncountable bits of information sent over fiber optic telecommunications links worldwide every second, optics based applications touch each of our lives in many ways every day. Moreover, this is a high growth field, with a drive towards novel light sources (e.g., single photon sources and high power lasers), integrating biological and optical systems (e.g., lab-on-a-chip solutions) and the realisation of quantum-based technologies through optics (e.g., quantum key distribution). Indeed, just as the 20th century technology was based on electrons and electronics, so the 21st century will be based on photons and photonics (think electrons down copper wires versus light down fibre optics). In 2007 the total photonics market surpassed that of micro-electronics for the first time, and is now in a sustained growth phase. The PISA Strategy has identified Communications as a strategic focus area, and this flagship programme aims to address this need. Communication is one of the fastest growing fields within photonics, but is well established technology. In this flagship we position ourselves to be ready for the next revolution in optical communication technologies: secure quantum communication.



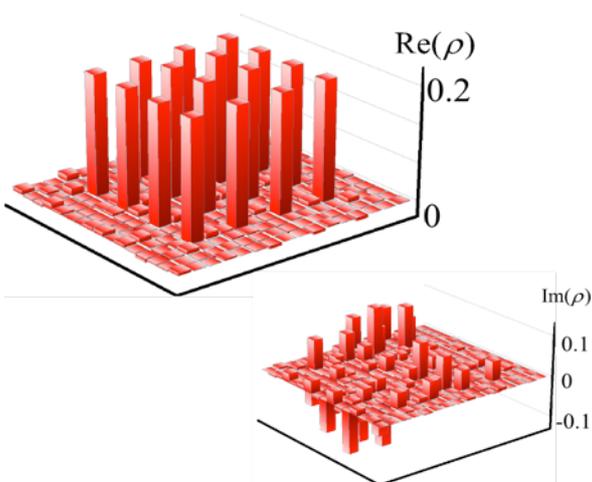
Pairs of entangled photons with opposite orbital angular momenta are generated by pumping a non-linear crystal.

Other quantum initiatives

The UK government launched a 270 million pound initiative in 2014 to develop quantum technologies. In 2010, the Chinese military demonstrated quantum teleportation over 16 km. Quantum teleportation is regarded as an important enabling technology for long distance quantum communication. However, DARPA (Defence Advance Research Projects Agency) in the US had already achieved

quantum teleportation over 23 km. Since much of this work is classified, it is not certain precisely how much has been achieved yet. It is known that the National Security Agency (NSA) is spending some 80 million USD in basic research on quantum computing. The motivation for this activity in quantum technologies is said to be a military communications "arms race." Already in 2008, DARPA announced that it is looking for innovative research in quantum entanglement for which it launched the Quantum Entanglement Science and Technology program. Investments of this nature are not restricted to governments and the military. Industry in the US and elsewhere also joined this race. A company called Quantum Technology Science secured 2.3 million USD from private investors to commercialise quantum technologies. In Canada, Mike Lazaridis, the BlackBerry billionaire, made a massive investment in Quantum Valley, saying that this technology could create a trillion dollar market. This is on top of investments made by the Canadian government to support quantum research. Canada's Institute for Quantum Computing has been established at the University of Waterloo more than a decade ago.

These are but a few examples that demonstrate the disruptive nature of the new quantum technologies and how much government, the military and the industry are prepared to invest to take advantage of the quantum revolution. In all such endeavours one finds quantum communication at its heart. The flagship consortium hopes to lead the South African photonics sectors in this field, for national relevance but international impact.



The state of a photon pair is represented by a density matrix with complex-valued entries. The diagrams on the left show a highly entangled state.

Further reading

1. McLaren MG, Roux FS and Forbes A, "Realising high-dimensional quantum entanglement with orbital angular momentum," *South African J. Science*, **111**(1/2), 2013-0322 (2015).
2. McLaren MG and Forbes A, "Exploiting quantum entanglement with photons," *Quest* **11**, 12-13 (2015).



The core team of the quantum communication project, from the left: Prof Andrew Forbes (Wits & NLC), Prof Thomas Konrad (UKZN), Prof Francesco Petruccione (UKN), Dr Stef Roux (NLC).

Teaching magnetospheric physics and dodging polar bears

Catherine Webster, Communications Officer SANSA Space Science

SANSA's Chief Scientist, Dr Mike Kosch, recently spent a week in Longyearbyen in the high Norwegian Arctic teaching magnetospheric physics to students at the University Centre in Svalbard (UNIS).

Longyearbyen is home to the world's northernmost university and is the "capital" of Svalbard, with just over 2 000 inhabitants involved mainly in coal mining, science and education, tourism and satellite tracking. With temperatures dropping to around -30°C , Svalbard is also a sanctuary for about 3 000 polar bears, an endangered and protected species.

"Since polar bears may actively hunt humans, especially when food is scarce, nobody is allowed to leave town without a person trained to handle an encounter with a polar bear. It is also prudent to inspect the immediate surroundings when you leave an isolated building to ensure there are no hungry bears around" says Mike. "Travelling into the arctic wilderness to conduct space science experiments requires special preparation and is safest with a local guide who knows how to find the way home if a blizzard suddenly appears"

Longyearbyen is also home to one of the European Incoherent Scatter (EISCAT) high-power radars which Mike usually visits to run space science experiments. However, this year's visit was focused on attending the Birkeland Centre of Excellence bi-annual research meeting and teaching magnetic reconnection and sub-storms in the magnetosphere to a group of international students from Germany, Finland, Norway, Sweden, UK and USA.



Svalbard Island is a remote place ...



With some dangers of the polar bear kind.

SANSA's Chief Scientist, was awarded 20 radar hours to the value of +/- R550 000, for the Black Aurora Radar Measurements of energy (BARMY) experiment at the EISCAT radar facility near Tromsø in northern Norway. His visit to the facility also included producing artificial auroras (24 radar hours) and verifying a unique theory which would allow SANSA's SuperDARN radar to measure an important aspect of climate change (8 radar hours).

Observing the mysterious black aurora

Many of us have seen breath-taking images of the aurora; a natural light display in the sky created when charged particles from the Sun slam into the Earth's magnetic field and interact with oxygen and nitrogen in the Earth's atmosphere. But did you know there is also a mysterious phenomenon known as "black aurora"?



South Africa's first Black Aurora Radar Measurements of Energy (BARMY) experiment took place at EISCAT on 11 March 2015. Dr Yosuke Yamazaki, a UK postdoctoral researcher involved in the EISCAT experiment, Dr Mike Kosch holding up the first data plot and Dr Mike Rietveld, EISCAT senior scientist celebrated the event with cake.

These are strange occurrences that produce dark, empty patches within a visible aurora.

“Black auroras are a bizarre and beautiful phenomenon which is currently without explanation,” says Mike. “We are trying to use the EISCAT radar to determine the energy of the charged particles within black auroras and compare these to the normal bright auroras. This may help us determine what causes the appearance of black auroras.”

Beaming up artificial aurora

Illuminating the Norwegian sky, a pulse of high-powered radio emissions from the EISCAT system kicked off a series of man-made aurorae to help SANSa scientists gain a deeper understanding of fundamental plasma physics. This is important for understanding various phenomena, including why the radiation belts around the Earth contain huge amounts of radiation.

An electron, much like a surfer on a wave, will gain sufficient energy in the presence of an electric field to collide with oxygen and nitrogen in the atmosphere, which produces the spectacular light displays. Mike and his team

are using the EISCAT radar to observe this process by exciting the oxygen and nitrogen particles with powerful radio waves to study how hot electrons interact in the ionosphere. These induced optical emissions are what we call artificial auroras which help researchers gain insight into what is going on in space.

Space monitoring radar to probe climate change



The EISCAT VHF radar near Tromsø in Norway is the largest radar of its type in the world, with a dish size of 120 x 40 metres.

With strong scientific evidence showing that the Earth's climate is changing due to rising levels of greenhouse gases, it is imperative that we find real solutions to this real situation. Research into climate change is vital in order to reduce and mitigate the effects it has on our planet.

SANSa's SuperDARN digital radar in Antarctica currently focuses on measuring the motion of charged particles (plasma) in the ionosphere. However, a new theory suggests that the radar may also be able to study an important aspect of climate change.

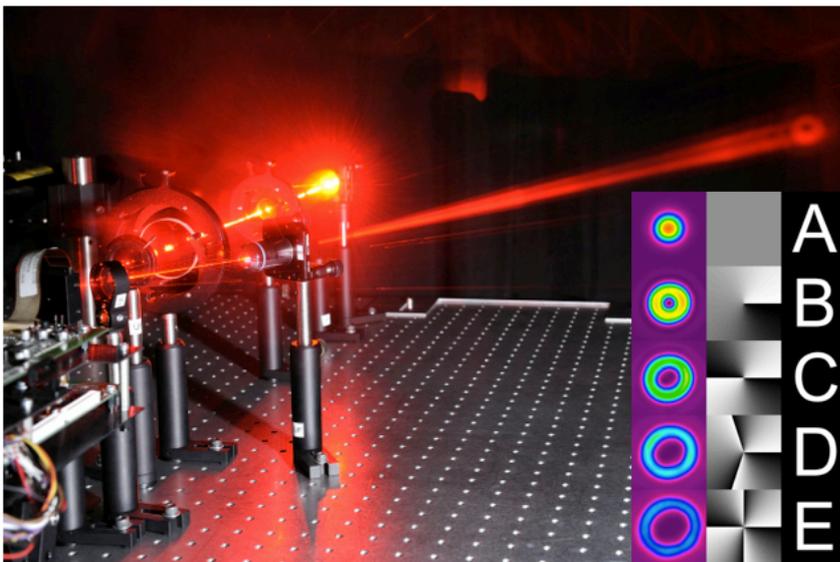
“If we can use the SuperDARN HF radar network to measure upper-atmosphere neutral density, we could observe global variations in neutral density caused by space weather events and monitor the slow collapse of the atmosphere, which is an important long-term consequence of climate change.”

Mike's theory, currently in testing phase, aims to demonstrate this possibility. “If the theory is correct, we will be able to do something which has never been done before with the SuperDARN radars,” say Mike.

Opportunities

Post-graduate positions available: Quantum communication flagship project

A new quantum communication flagship programme has just been launched by the Photonics Initiative of South Africa (PISA). A consortium of three institutes comprising the University of the Witwatersrand (Wits), University of KwaZulu-Natal (UKZN) and the Council for Scientific and Industrial Research (CSIR) will attempt to demonstrate a quantum communication link using high-dimensional quantum states in both free space and in fibre. The project will be led by Prof. Andrew Forbes (Wits) with core team members of Prof. Thomas Konrad (UKZN), Prof. Francesco Petruccione (UKZN) and Dr Stef Roux (CSIR).



We have opportunities at MSc, PhD and Post-Doctoral Fellow levels for suitable candidates with an interest in:

- Quantum entanglement;
- Quantum information processing and quantum communication;
- Free space communication;
- Structured light;
- Fibre optics.

We welcome applicants with an interest in theoretical and/or experimental studies, with options to be based at one of the three centres: UKZN (Durban), CSIR (Pretoria) or Wits (Johannesburg). We promote joint supervision and mobility between centres, project dependent. We are seeking motivated applicants with a good academic track record in physics or related disciplines.

To apply, please send a CV and a link to a self-created YouTube video where you motivate why you want to join the project. You may address it to one or more of the project leaders:

Prof. Thomas Konrad: konradt@ukzn.ac.za

Prof. Francesco Petruccione: petruccione@ukzn.ac.za

Dr Stef Roux: fsroux@csir.co.za

Prof. Andrew Forbes: andrew.forbes2@wits.ac.za or aforbes1@csir.co.za

Upcoming Conferences & Workshops

Bring International Physics Conferences to South Africa

The SAIP Office would like to help South African physics community to bring international conferences and workshops to South Africa. The SAIP can help with hosting these conferences as well as preparing bidding documents, budgeting and fundraising.

The SAIP office has helped in hosting very successful international physics conferences and workshops.

Please email the conferences you want us to help bring to South Africa to info@saip.org.za

SAIP2015

The SAIP2015 Annual Conference will be held in Port Elizabeth from 29 June to 3 July 2015 for more details visit www.saipconference.co.za



The poster for the SAIP Conference 2015 features the South African Institute of Physics logo on the left, which is a stylized red atom symbol. The main text in the center reads: **SAIP CONFERENCE**, 28 JUNE – 3 JULY 2015, BOARDWALK CONVENTION CENTRE, PORT ELIZABETH, NELSON MANDELA BAY. Below this, it lists 'Conference Management: Eastern Sun Events' with a telephone number (+27 41 374 5654) and an email address (tanya@easternsun.co.za), along with the website www.saipconference.co.za. On the right side, there are logos for Nelson Mandela Metropolitan University and Rhodes University. At the bottom, there are five small rectangular images showing a savanna with elephants, a coastal town, a person in a boat, a beach, and a modern building. The words 'SAVE THE DATE' are written in large, bold, white letters across the bottom of the poster.

SAAPMB 2015 Cancer Imaging

The 53rd National Congress of the South African Association of Physicists in Medicine and Biology (SAAPMB) will be held from 23 – 27 September 2015 under the theme Cancer Imaging in the friendly city of Bloemfontein, South Africa.

Do not miss out on this outstanding Spring event with a hands-on training workshop, congress contributions from local and international speakers and an overseas expert panel on the topics of Medical Physics, Radiotherapy and Diagnostic Imaging. With our common goal of fighting cancer in a rapidly developing information and technology driven era, we would be delighted to have you present at the congress. Use this opportunity to be inspired, motivated and to network with your peers and other experts in your profession. As always in the centre of the hearty Free State province, the social programme will be especially enjoyable.

For more information and registration visit <http://www.saapmb2015.co.za/>

Biophysical Society Thematic Meeting

Biophysics in the Understanding, Diagnosis and Treatment of Infectious Diseases

NOVEMBER 16-20, 2015

SPIER WINE ESTATE, STELLENBOSCH, WESTERN CAPE, SOUTH AFRICA

This meeting will explore the contributions of biophysics to our understanding of infectious diseases focused on tuberculosis, malaria and HIV/AIDS. The meeting will provide a platform for scientists to discuss the successes, opportunities and challenges for biophysics in structural biology, molecular modeling and high resolution optical techniques in diagnostics, therapeutics and the basic science of the pathogen. The venue being South Africa will provide the opportunity to meet many new scientists and students.

ORGANIZERS

Bryan Trevor Sewell, University of Cape Town, South Africa
James Sacchettini, Texas A&M University, USA

SPEAKERS

Frederick Balagaddé, KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), South Africa
Tom L. Blundell, University of Cambridge, UK
Alberto Diaspro, Istituto Italiano di Tecnologia, Italy
Heinrich Dirr, University of the Witwatersrand, South Africa
Musa Mhlanga, Council for Scientific and Industrial Research (CSIR), South Africa
Pradipsinh Rathod, University of Washington, USA
Stefan Raunser, Max Planck Institute of Molecular Biology, Germany
James Sacchettini, Texas A&M University, USA
Helen R. Saibil, Birkbeck, University of London, UK
Wolf-Dieter Schubert, University of Pretoria, South Africa
B. Trevor Sewell, University of Cape Town, South Africa
Michael Starnbach, Harvard Medical School, USA
Adrie Steyn, KwaZulu-Natal Research Institute for Tuberculosis and HIV (K-RITH), South Africa
Sriram Subramaniam, NIH NCI, USA
Frank von Delft, University of Oxford, UK
Gabriel Waksman, University College London, UK
Tim Wells, Medicines for Malaria Venture (MMV), Switzerland
Robin Wood, Desmond Tutu HIV Centre (UCT), South Africa
Peijun Zhang, University of Pittsburgh School of Medicine, USA

IMPORTANT DEADLINES

Abstract Submission July 20, 2015
Early Registration.....August 24, 2015

Biophysical Society

For more information, visit www.biophysics.org/2015southafrica

Physics Comment Editorial Policy

Deadline for submissions for the June 2015 issue of Physics Comment is 31. Mai 2015

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 review journal.

Physics Comment publishes innovative reports, features, news, reviews, and other material, which explore and promote the many facets of physics. Physics Comment endeavours 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 to encourage writers in their own researches. 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, which are being published, may contain personal opinions of the authors.

It is our 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:

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The author allows PC to edit the work for clarity, presentation, including making appropriate hypermedia links within the work.

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 reflects 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 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:

PhysicsComment@saip.org.za

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

Photography and Illustration. All solicited photography and illustration 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. Acknowledgement must be made within the article.

News: These are short editorial items usually not more than 250 words. Full colour pictures must be clearly referenced on the editorial submission and on 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 by 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 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/>