



# Minutes of the 183<sup>th</sup> Meeting of the Council of the South African Institute of Physics (with Chairs of the Specialist Groups)

Date: Thursday, 10 July 2008, Time: 18h30 to 22H00  
K-Block Boardroom, University of Limpopo, Polokwane

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## 1. Opening and Attendance

The President, Prof. Chetty chaired the meeting and welcomed everyone.

**Present:** Prof. N. Chetty (President), Dr. S.H. Connell, Prof. J.A.A. Engelbrecht (Treasurer), Dr. A. Forbes (Secretary), Dr. I.M.A. Gledhill, Dr. P. Martinez, Mr. B. Masara, Prof. H. Moraal, Prof. E.G. Rohwer, Dr. R. Newman, Prof. D.T. Britton, Prof. T.E. Derry, Prof. P. Charles and Dr. K. Govender.

**Apologies:** Dr. G. Arendse and Prof. G.C. Hillhouse.

## 2. Summary of new Specialist Group members (2008 – 2010)

### I. Nuclear, Particle and Radiation Physics Specialist Group:

- Chairperson: Dr. Simon Mullins (iThemba LABS) email: [smm@tlabs.ac.za](mailto:smm@tlabs.ac.za)
- Secretary: Dr. Noel Jacobs (Univ. of Stellenbosch)
- Industrial liaison: Prof. Simon Connel (Univ. of Johannesburg)
- International liaison: Prof. Steven Karataglidis (Rhodes)
- Webmaster: Mark Dalton (Wits)
- Outreach: Dr. Gillian Arendse (iThemba LABS)
- Student representative: J. Diener (Univ. of Stellenbosch)
- Future projects: Prof. John Carter (Wits) and Dr. Rob Bark (iThemba LABS).

### II. Condensed Matter Physics and Material Science Specialist Group:

- Chairperson: Prof. David Britton (Univ. of Cape Town) email: [david.britton@uct.ac.za](mailto:david.britton@uct.ac.za)
- International liaison: Prof. Steven Karataglidis (Rhodes)
- Committee members:
  - Prof. David Britton
  - Prof. Hendrik Swart
  - Prof. Koos Terblans
  - Prof Japie Engelbrecht
  - Prof Karen Pruessner
  - Ms Mmantsai Diale
  - Prof Johan Malherbe

### III. Physics Education Specialist Group:

- Chairperson: Dr. Gillian Arendse (iThemba LABS) email: [gja@tlabs.ac.za](mailto:gja@tlabs.ac.za)
- Vice Chairperson: Sam Ramaila (Univ. of Johannesburg)
- Vice Chairperson: Kevin Govender (SAAO)

#### **IV. Applied Physics Specialist Group:**

- Chairperson: Prof. T Derry (Univ. of the Witwatersrand) email: [trevor.derry@wits.ac.za](mailto:trevor.derry@wits.ac.za)
- Committee members:
  - Phil Ferrer
  - Katse Maphoto
  - Freddie Vorster
  - Angus Morrison
  - Chantelle Radue

#### **V. Astrophysics and Space Science Specialist Group:**

- Chairman : Dr Ramotholo Sefako (SAAO) email: [rrs@saa.ac.za](mailto:rrs@saa.ac.za)
- Secretary: Dr Stefan Ferreira
- Treasurer Dr Patrick Woudt
- Student representative (Space Science): Patrick Sibanda
- Student representative (Astrophysics): Marissa Koltze

#### **VI. Lasers, Optics and Spectroscopy Specialist Group:**

- Chairperson: Dr Andrew Forbes (CSIR NLC) email: [aforbes1@csir.co.za](mailto:aforbes1@csir.co.za)
- Fund Raising: Dr Anton du Plessis (CSIR NLC)
- Industrial Liaison: Dr Lourens R Botha (CSIR NLC)
- Secretary, Treasurer: Prof. Heinrich Schwoerer (Univ. of Stellenbosch)
- Publicity, Membership, General: Prof. Erich Rohwer (Univ. of Stellenbosch)
- Public awareness, Schools Liaison. Daniel Esser (CSIR NLC)
- Student representative: Gurthwin Bosman (Univ. of Stellenbosch)
- Webmaster: Pieter Neethling (Univ. of Stellenbosch)

#### **VII. Theoretical Physics Specialist Group:**

- Chairperson: Prof. Hendrik Geyer (Univ. of Stellenbosch) email: [hbg@sun.ac.za](mailto:hbg@sun.ac.za)
- Student representative: Michael Nock (Univ. of Kwazulu-Natal)
- Committee members:
  - N Chetty
  - R De Mello Koch
  - WD Heiss
  - A Muronga
  - F Pettrucione
  - FG Scholz

### **3. Minutes of Previous Meetings**

Minutes of the previous meeting were accepted.

## **4. Matters arising from the Minutes**

### **4.1. Education**

It was requested that participation of teachers and learners at the SAIP conference be encouraged. Furthermore, the training of teachers at national facilities should also be encouraged. It was noted that the SAIP and the Department of Education should work together for the training of teachers in the Physics curriculum.

**Action:** All issues will be referred to the CEC by Council.

### **4.2. Official certificate for student prizes**

It was suggested that there be an official certificate designed by the SAIP which may be used when handing out student prizes.

**Resolution:** Council leaves this to each specialist group to design, but requested that the new SAIP logo be used appropriately on the certificate.

### **4.3. Speakers not attending the conference**

It was noted that some speakers have their abstract listed but do not present the talk.

**Action:** Council noted the concern and agreed to monitor the situation in future. The local organising committee (LoC) would be asked to monitor this on behalf of Council.

## **5. Matters relating to the Conference**

### **5.1. Selection of plenary speakers**

The selection rules for plenary speakers and the input from the specialist groups was queried. It was pointed out that the LoC often makes decisions without any input from the specialist groups. Council pointed out that the LoC is meant to liaise with specialist groups prior to any decision on plenary speakers.

**Action:** PM to address with the next LoC.

### **5.2. Conference programme**

It was noted that the specialist groups should have the final say on the programme within their sessions, and that this should not be done by the LoC alone. Council felt that the close involvement by the SAIP Executive Office (EO) would address this issue. Council also felt that the specialist groups should be more assertive in putting their case forward to the LoC.

**Action:** EO to address this with the LoC in future.

### **5.3. Posters at the annual SAIP conference**

It was noted that posters should be given more prominence at the conference.

**Action:** Will be highlighted by Council to the LoC at UKZN.

## **6. Specialist Group Reports (taken verbatim from submitted reports)**

### **6.1. Applied Physics (chair: Prof. Derry)**

The level of interest is buoyant (31 orals, 3 posters). Consultation with other specialist groups possible in assessing abstracts and prizes.

AGM was attended by 14 people. Committee was elected.

Committee:

Phil Ferrer

Katse Maphoto

Freddie Vorster

Angus Morrison

Chantelle Radue

## **6.2. Astrophysics and Space Science (chair: Dr McKinnell)**

The current committee is as follows:

Chair: Dr Lee-Anne McKinnell ([L.McKinnell@ru.ac.za](mailto:L.McKinnell@ru.ac.za))

Secretary: Prof. Phil Charles ([pac@sao.ac.za](mailto:pac@sao.ac.za))

Fundraiser: Dr Ramotholo Sefako ([rrs@sao.ac.za](mailto:rrs@sao.ac.za))

Student Representative: Jasper Snyman ([fskjs@puknet.ac.za](mailto:fskjs@puknet.ac.za))

### **Annual conference:**

A total number of 52 abstracts were submitted for consideration in this year's program. The group was allocated 30 slots for oral presentations, resulting in a number of papers being moved to the poster session. The resulting SAIP 2008 programme was very full with 30 oral presentations, and 22 posters. There was good representation from the student community with 36 student presentations of which 11 were posters. However, the pressure on slots meant that disappointingly there was no room for non-specialist lectures this year. Nevertheless, an "extra" more general presentation was arranged on the Thursday evening (July 10) when Prof Roy Booth, Director of HartRAO, gave a "mini-plenary" talk on "MeerKAT and the road to the SKA", which was well attended.

Thanks to the generous contributions by the national facilities and the Center for High Performance Computing (CHPC), student prizes will be awarded again this year. The categories for student prizes have been reworked with 6 categories now existing as follows:

PhD 1<sup>st</sup> Prize, PhD 2<sup>nd</sup> Prize, MSc Prize in Astrophysics, MSc Prize in Space Science, a Poster Prize and an Encouragement Prize.

As in 2007, an encouragement prize will again be awarded in 2008 to a student who through the presentation of their paper demonstrates that significant effort has been put into producing a good presentation, but who does not necessarily qualify for one of the other prizes. This prize can be awarded to a student who is known to have overcome significant hurdles in order to present, for example, non-english first language background.

Prizes were funded by HMO, SAAO, HartRAO, CHPC and SAIP. Arrangements have been made for all funds to be transferred to the awardees electronically, using the SAIP account, in order to have greater accountability.

The SG committee would like to record the fact that significant problems were encountered with organizing the programme for the 2008 SAIP conference, and would like to request that the SAIP LOCs be expressly advised to communicate with the SG chairs all the time in respect of the programme. Also, our group found it particularly difficult to fit into 3 days when we already have a problem with the limited number of oral slots available. We are growing our group and trying to strengthen participation in SAIP especially by students, and some of the experiences in preparation for the 2008 SAIP will definitely hinder this growth.

### **Specialist Group Meeting**

A specialist group meeting was held during SAIP 2008 on Wednesday 9 July 2008. About 50 people attended from within the Astrophysics and Space Science community, of which approximately half were students. There were 2 main items addressed by the group:

- (i) Election of group officers. Single nominations were put forward for the posts of Chairman (Dr Ramotholo Sefako, SAAO), Secretary (Dr Stefan Ferreira) and Treasurer (Dr Patrick Woudt, UCT), and these were duly elected unopposed. Four nominations were received for Student Representative, and it was decided to elect one each from the astrophysics and space science communities. Voting by the students present resulted in the election of Patrick Sibanda (space science) and Marissa Koltze (astrophysics).
- (ii) Operation of group at SAIP with single or parallel sessions. This issue was discussed at last year's meeting, at which there was no clear consensus on the way forward. However, the continued growth in both communities has led to an increased number of abstracts being submitted, which, combined with the reduction of this meeting from 4 to

3 days, made it impossible to accommodate all requests for oral presentations. Indeed, it was only possible to achieve the Limpopo schedule by omitting the non-specialist presentations at this meeting, a change that caused concern amongst all present. While efforts are underway to improve the participation in and profile of poster presentations, both the astrophysics and space science fields are clearly deserving of higher levels of support at SAIP. Following a lively discussion of how best to resolve this problem, there was unanimous support for moving to parallel sessions for the specialist presentations of each community, but with joint sessions for non-specialist lectures. It was proposed that the non-specialist talks be solicited in ways that would make them of interest to all. Such a change in organisation of group presentations would make it much easier to accommodate the 3 day meeting format if it is continued. This proposal was recognised as the best solution to the current problem (where several students who had wished to make presentations were unable to do so), while maintaining the cohesiveness of the astrophysics and space science communities. It was further proposed that, for the effective running of the group, the posts of Chairman and Secretary be divided and alternate between the two communities (as has informally been the case in recent years).

PAC also informed the meeting of the possibility of South Africa as a host for the 2015 General Assembly of the IAU, and what the consequences of doing this would be. Furthermore, Cape Town had already been offered as host of the 2011 regional meeting of the IAU for the Middle East and Africa (MEARIM).

### **HartRAO**

The two most significant events at HartRAO during the past year are the final erection and commissioning of the XDM KAT prototype antenna, and the achievement of e-VLBI connectivity to Europe with a sustained data rate of 32 Mb/s

The 15m composite reflector of the XDM antenna, measured using photogrammetry, was found to have an rms surface accuracy of around 1.5 – 2.5 mm, making it a useful dish at frequencies as high as 12 GHz, as proven through observations of Venus with a HartRAO built 12 GHz receiver..

Hartebeesthoek is one of the few remaining antennas of the European VLBI network to achieve real-time fringes using the technique of e-VLBI. This was achieved in May 2008 when the final fibre connections from the observatory to the SANREN system were put in place. With pressure from DST and help from SANREN and the Muraka institute of CSIR, we were able to connect directly to the VLBI processor of the Joint Institute for VLBI in Europe. Connectivity was even achieved between HartRAO and the Arecibo telescope in Puerto Rico

### **HMO**

This section contains highlights from HMO for the period July 2007 – June 2008.

During the year the HMO holds three major schools for students, namely:

- A summer school in Digital Signal Processing for 3<sup>rd</sup> year students;
- A summer school in space physics for NASSP honours students;
- A winter school in space physics for 3<sup>rd</sup> year students;

All 3 schools have been very well supported in the past year, and HMO has received good evaluations from the students attending. This year also saw a record number of students attending and there was support from a number of universities sending students for the first time.

During November 2007, Dr Lee-Anne McKinnell, Dr Pierre Cilliers and 2 students traveled to Ethiopia to attend the International Heliospherical Year (IHY)-Africa 2007 workshop in Addis Ababa. This workshop was held in conjunction with the 2008 SCINDA workshop, and was well attended with some 60 African scientists.

Dr Lee-Anne McKinnell attended the annual International Reference Ionosphere (IRI) workshop in Prague, Czech Republic during July 2007. Two students also attended and all presented on their recent research findings.

Dr Ben Opperman and Dr Andrew Collier travelled to the SANAE Base in Antarctica as part of the summer take over team. Dr Opperman was assisting the IPY engineers with new equipment installation, and Dr Collier was performing maintenance on the VLF receiver equipment housed at SANAE. During the 3 months of the 2007/2008 take over, HMO had a record number of 8 staff members at the base.

The Department of Communications (DoC) has purchased a new ionosonde (Digisonde DPS-4D) which has been installed in Hermanus at the HMO. Much of the past year has been spent on the infrastructure required for housing the ionosonde, and the antenna fields. The ionosonde arrived at HMO in June 2008 and was installed on the 1 July 2008.

## **SAAO**

2007/08 has been dominated by SALT commissioning and the ongoing investigations into the two main problem areas that have prevented SALT from reaching its design goals:

- (i) the image quality (IQ) does not meet specification across its full field of view, and moreover shows variability in IQ. Extensive efforts by SALT and SAAO staff have shown that the problem lies in the opto-mechanical interface of the SAC (Spherical Aberration Corrector) to the payload structure. A mechanical redesign is now underway with major progress expected by the end of the year.
- (ii) the blue throughput loss in the main SALT instrument, RSS (Robert Stobie Spectrograph) is due to an optical problem with the lens coupling fluid. This required dismantling and dismantling RSS so as to send the optics back to California for repair (and where necessary, remanufacture). The problem is now fully understood. We are expecting the optics to return to SA imminently, when RSS will be reassembled, realigned and fully tested before remounting on SALT. This is likely to happen in Sep/Oct, but the precise schedule is linked to the SAC repair.

Meanwhile all SALT testing and observing is being performed with SALTICAM, the imaging camera, in both conventional and fast modes. At the Durban SALT Board meeting in October, both AMNH and IUCAA were formally welcomed as new SALT partners. At the Gottingen SALT Board meeting in May, the University of Wisconsin announced their receipt of a \$3.3M grant to build the near-IR arm of RSS, and construction will begin shortly.

SAAO's Cape Town site is undergoing a major electrical upgrade/refurbishment in order to support a new IT centre which will house a data archive/processing facility for SALT data. In Sutherland, the new Recreation Centre for local staff, visitors and observers was opened by Prof Krish Bharuth-Ram. All these developments have been funded jointly by the SALT Foundation and NRF/DST.

### **6.3. Condensed Matter Physics and Material Science (chair: Prof. Britton)**

The specialist group sessions were well attended, particularly by younger and student members, and available presentation slots were filled. The Awards Programme was again advertised widely in order to encourage students to present their research work in the fields of Condensed Matter Physics and Materials Science. Entries were received for all categories, except for the two Honours prizes: the essay and the poster presentation at the conference. The winners of the other 7 prizes will be announced at the conference dinner and published on the website.

An email call for nominations was issued in June. The only nomination received in addition to the existing committee was Prof Karen Prussner. Prof David McLachlan decided not to stand for re-election. The membership of the new committee was ratified by the AGM. The other elected members are Prof David Britton, Prof Hendrik Swart, Prof Koos Terblans, Prof Jaapie Engelbrecht, Ms Mmantsai Diale, and Prof Johan Malherbe. Dr. Chris Theron of Element Six will continue as the Industry Representative.

A third workshop in the highly successful "photonics materials" series will be organized by Prof Danie Auret to be held in 2009.

## **6.4. Lasers, Optics and Spectroscopy (chair: Dr. Forbes)**

### **SAIP 2008**

The 2008 conference has once again been a success for the group, with around 26 oral and 26 poster presentations. The format of the conference this year resulted in the NLC user group report back meeting being held as an extension of the SAIP conference on Monday. This arrangement is mutually beneficial. The subgroup again managed to secure sponsorship from the CSIR(NLC), the Laser Research Institutes and their respective OSA student chapters, Scientific Development and Integration, and the SAIP for student prizes. The Plenary speaker Prof Zumbusch was sponsored by the LRI and the NLC.

### **Photonics initiative**

The Photonics Initiative of South Africa (PISA) status: A workshop between representatives of stakeholders will be held on the 5-6th August to generate a strategy for PISA. All members are encouraged to contribute the take part in the initiative.

### **The NLC**

The CSIR(NLC) continues to serve the lasers community through its rental pool program. The rental pool program feedback session was held on the Monday before the SAIP meeting.

### **The ALC**

The ALC is an ongoing initiative, fully funded by the South African government. An ALC course on an Introduction to Lasers at Stellenbosch was held in November. Another is planned for this year, funding is still pending. A successful students meeting was held at Kariega during 2008.

### **ICO**

Application for membership in progress.

### **High power laser workshop**

The planned high power laser workshop (NLC IThemba LABS, LRI) has received funding and will take place in January at STIAS in Stellenbosch. Particle Acceleration and Generation of High Energy Radiation with High Intensity Lasers, January 12 – 16, 2009, Stellenbosch Institute for Advanced Study.

### **OSA chapters**

Student chapters at NLC and LRI.

### **Terms of Reference**

The TOR was discussed at the specialist group meeting. Changes were made in view of potential outcomes of PISA. Out of one portfolio two were created:

Fund Raising:

Industrial Liaison:

### **Election of committee for specialist group**

Chairperson: A Forbes

Fund Raising: A du Plessis

Industrial Liaison: LR Botha

Secretary, Treasurer: H Schwoerer

Publicity, Membership, General: E Rohwer

Public awareness, Schools Liaison. D Esser

Student representative: G Bosman

Webmaster: P Neethling

## **6.5. Nuclear, Particle and Radiation Physics (chair: Dr. Mullins)**

### **SAIP08 Conference Statistics**

There will be a total 35 presentations (28 oral and 7 poster) in the NPRP Specialist Group sessions. There will be 7 M.Sc. and 4 Ph.D. level oral contributions, respectively and 4 M.Sc.

and 1 Ph.D. level poster presentations, respectively. Due to time constraints 5 oral contributions had to be shifted to Applied Physics and Theoretical Physics sessions.

### **SAIP08 student prizes**

Four cash prizes, namely 2 Ph.D. prizes of R1250 and R1000 (courtesy Bio-Teknik), 2 M.Sc. prizes of R1250 and R1000 (courtesy Bio-Teknik). Presentations are being judged by Dr. Zinhle Buthelezi (iThemba LABS), Prof. J.F. Sharpey-Schafer (UWC) and Prof. S. Karataglidis (Rhodes). Dr. Simon Mullins will hand over prizes at the banquet.

### **Activities associated with committee portfolios**

#### **Future Projects: R Bark, J Carter**

##### Report (Rob Bark)

One of the possible future directions for nuclear physics research is to exploit radioactive beams to produce exotic nuclei. The possibilities for the production of radioactive beams at iThemba LABS were presented in a talk at SAIP07. They can be broadly classified under two techniques, Projectile Fragmentation (PF) and Isotope Separation OnLine (ISOL). The former technique typically requires relativistic beam energies while the latter technique requires two accelerators. At iThemba LABS, the installation of the GTS ECR ion-source will allow beams of up to A~40 to reach energies of up to 30~40 MeV/A, allowing some light exotic beams to be produced.

For ISOL beams, the possibility of a second accelerator at iThemba has been raised in discussions with NECSA, in connection with commercial isotope production. These discussions are still at a preliminary stage, but the new accelerator could deliver a high-intensity proton beam of 70 MeV, which could be split and used in two separate beamlines, one for isotope production and one for physics use. The second beam could form the driver for an ISOL system while the SSC would fulfil the role of post-accelerator.

A possibility would be the fissioning of uranium to produce neutron rich isotopes. An ion-source would then need to be developed to extract the desired radioactive beam species. A promising method to selectively ionize the species of interest with high efficiency is to use laser ionization. This technique would need some development but sufficient expertise exists in South Africa to do so.

iThemba LABS has contacted Professors Heinrich Schwoerer and Erich Rohwer of the University of Stellenbosch (US) for advice on laser ionization. A current interest at US is the use of lasers to *accelerate* ions, with the iThemba LABS site being ideal for this purpose. Because of the mutual interest in lasers and accelerators, a workshop on "Lasers and Accelerators" has been planned for January 2009. Two speakers have been invited to give lectures on laser ionization, Dr Iain Moore from the University of Jyväskylä and Dr Ulli Köster from ISOLDE at CERN. The next stage would be to build a demonstration laser ionization source, using existing beams from the SSC.

In a separate development, the SA-CERN Programme has proposed travel money for use of South African researchers for visits to the REX-ISOLDE radioactive beam facility.

#### **Outreach : GJ Arendse [iThemba LABS]**

##### Report

The activities related to the promotion of Nuclear Physics amongst learners, teachers, students and the general public has for the biggest part of the year been driven by individuals linked to the national facilities and universities without real input from the "liaison officer". To this extent a (very succesful) summer school was held which was organized by staff at iThemba Gauteng and Wits. I have however had the opportunity to accompany students to Dubna in Russia, where I had limited input into what "we would like to get out of the exercise". The students did however get the opportunity to give

short presentations on their experiences during the week. I have recently (1 January) joined iThemba LABS as Manager of their Science and Technology Awareness Programme. I have since my appointment presented an overview of the activities at iThemba LABS to learners who attended the science week in Stellenbosch. We have also had a learner from Rondebosch High who spent three days jobshadowing staff at iTL (physics, medical radiation, isotopes and materials research). The interaction with learners and teachers are on-going and will definitely pick up in the near future.

### **International Liaison: Z Buthelezi [iThemba LABS]**

#### Report

The "newly" established SA-CERN programme: this is a huge initiative driven by SA scientist involved in CERN (European Center for Nuclear Research situated between Switzerland and France) projects e.g. ALICE, ATLAS, ISOLDE, etc. The programme which includes scientists from iThemba LABS, UCT, WITS, Rhodes University and UKZN is funded by DST. The funds will enable scientists (and students, where applicable) to travel to CERN to partake in experiments and to attend collaboration meetings as well. There are many opportunities within this programme for both scientists and students alike. For more info contact Prof Jean Cleymans (chair), Jean.Cleymans@uct.ac.za or the secretary, Dr SV Fortsch (fortsch@tlabs.ac.za).

I would like to bring your attention to a training possibility in beam instrumentation for postgraduate students or young scientist (at MSc, PhD and/or Post doc level) which was advertised by Dr Anne Dabrowski (CERN Fellow working on a CLIC project). This is a European initiative (DiTANET: Diagnostic Techniques for future particle Accelerators, <http://www.kip.uni-heidelberg.de/DiTANET/>) to encourage education in Novel instrumentation, funded through the Marie Curie fellowship program. Dr Anne Dabrowski is a former UCT graduate who holds a prestigious fellow position at CERN. Her group (CLIC: Compact Linear Collider is a future electron-positron collider proposed at CERN to explore energy regions beyonds those reached by current particle accelerators) are opening 3 positions for "early stage researcher" and she'll be co-supervising one of the positions. This is a great opportunity for someone whose at MSc, PhD level and has interest in Accelerator Physics and associated fields.

### **Nuclear Physics Schools and Symposia**

#### **iThemba School on Nuclear and Particle Physics and Applications 2008**

[report by Elias Sideras-Haddad, Chairman iThemba School 2008]

The 2008 iThemba School in Nuclear and Particle Physics organised by iThemba LABS Gauteng was held at the Skukuza Auditorium within the Kruger National Park from Sunday 27.01.08 to Sunday 03.02.08. A total of 62 students from various universities (North-West, Zululand, Wits, UCT, Nelson Mandela, Fort Hare, UWC, Pretoria and Stellenbosch) attended the School. The student audience was made up from about 25% B.Sc. level, 25% B.Sc. Honours and about 50% of postgraduate students (M.Sc. + Ph.D.). The interest and enthusiasm shown by the students for the School went well beyond the expectation of its organizers. The well selected and prepared material by the lecturers and sophistication in teaching style took the students aback. The School acted as an eye-opener for the students and motivated those to get involved in high standards postgraduate research studies.

#### **Winter School for South African postgraduate students at the Joint Institute for Nuclear Research in Dubna, Russia**

23 Students from across South Africa attended the Joint Institute for Nuclear Research (JINR) Winter Practice in Dubna, Russia from 9 to 19 December 2007. This visit was as a result of the Memorandum of Understanding (MOU) signed between South Africa and the JINR in October 2005, in Moscow. The JINR is an international organization that was established in 1956. It consists of eighteen member countries and 71 partnering institutions in 45 countries mostly from central and Eastern Europe. It is also one of the foremost nuclear research establishments in the world and is credited, for example, with the discovery of several new elements of the periodical table. Contacts between South African researchers and those based in the Russian Federation date back to the late nineties. The MOU designates South Africa, through the

Department of Science and Technology (DST), an associate member of the JINR. South Africa's financial contribution covers its membership fee as well as support for joint projects with JINR. In 2006 an amount of \$ 1 250 000 was earmarked for the collaboration and the DST has delegated the National Research Foundation (NRF) to administer the funds for future projects. The aim of the Winter Practice was to give its participants an idea of JINR fields of research and offer them a possibility to meet JINR research teams. Students worked on research projects at JINR facilities and attended lecture courses delivered by leading JINR scientists. Over the weekend they enjoyed social excursions to Sergiev Posad, the centre of the Russian Orthodox Church, as well as Moscow.

### **Inaugural mini-symposium on gamma spectroscopy**

The inaugural mini-symposium on gamma spectroscopy was held on the afternoons of Wednesday and Thursday (23 and 24 April 2008), in the auditorium at iThemba LABS. There were informal presentations on some "hot" topics related to the present and future gamma spectroscopy research at iThemba LABS. Dr. Elena Lawrie (iThemba LABS) was the symposium organizer.

### **Symposium: *From EARTH to the Moon***

An afternoon mini-symposium surrounding topics related to the Earth Antineutrino Tomography (EARTH) project was held at iThemba LABS (iTL) on Friday, 29 February 2008 in the iTL auditorium. EARTH is an ambitious international research programme with the aim of mapping the location of the radiogenic heat sources in the Earth's interior. The programme in South Africa is a collaboration of the three Cape universities and iThemba LABS. Presently a detector is being built with which the feasibility of such a project will be tested. After testing at iTL, further tests will be carried out using antineutrinos at Koeberg. This also signals a potential spin-off of the project, namely the monitoring and safeguarding of nuclear power reactors. Dr. Ricky Smit (iThemba LABS) was the organizer.

### **Future events**

- September-October 2008: School on nuclear and particle physics (venue: JINR, Dubna, Russia)
- early January 2009: Workshop on lasers and nuclear physics (venue: iThemba LABS)
- late January 2009: Chris Engelbrecht Summer School focusing on Nuclear Astrophysics (venue: Stellenbosch Institute for Advanced Studies)
- February 2009: School on synchrotron physics (venue: to be announced)
- January 2010: iThemba LABS School on Nuclear and Particle Physics (venue: to be announced)

### **Report from the Director of iThemba LABS, Dr. Z. Vilakazi**

This past year has been characterised by major challenges which iThemba LABS (and users) have had to contend with. Paramount of these is the power/energy crisis and its impact on beam availability for physics research.

- iThemba LABS' management was thus put in a position in which decisions had to be made; which - to this end - has meant that a new/revised schedule for physics was arrived at. This was part of iThemba LABS playing a role in reducing the baseline load demand on the grid (recall that iThemba LABS is considered a Large Power user (LPU) drawing close to 5.4 MW!). Proton therapy is now conducted on one weekend per month instead of on Monday and Friday mornings. On all other weekends the energy change for Physics beam will commence at 06:00 on Friday morning with beam on target expected at ~12:00. If there is a need for iThemba LABS to reduce average power consumption (voluntary load shedding) the accelerators will be switched off on Monday morning. However Physics will be able to continue until 12:00 on Mondays if the demand on the National Grid allows it.

- Positive news relate to the fact that we have had a bumper year with isotope production reaching an all-time high of R12.5m!

- The SA-CERN programme (headquartered at iThemba LABS) and chaired by Prof Cleymans (UCT) is a major South African initiative of a disparate consortium of researchers to leverage resources for access to world leading facilities. The programme consists of the following member institutes: iThemba LABS-UCT (ALICE); UJ-Wits (ATLAS); UKZN-Wits (ISOLDE) and Rhodes (nuclear and HEP phenomenology). A business plan has been submitted to DST and a

governance structure is now finalised. The SAIP president will be kept abreast of the details of the programme.

- Development of ECR ion sources: The ECR ion source from the Hahn-Meitner Institute should be able to deliver beam by the end of August. The final components for the second new ECR source will be delivered within the next month, after which installation will commence.

- iThemba LABS Summer School: A very successful summer school was held at the Kruger National Park (Skukuza Camp) in January 2008. Following from the recommendations of last years' committee - the school has now been renamed iThemba Summer School in Nuclear and Particle Physics. The organisation and management was done by iThemba LABS under the chairmanship of Prof Haddad with Dr Machi providing institutional support. The school was - once again - a resounding success.

- Dubna agreement: The programme is now in its third year. Areas of success can now be noted. Dr Simon Mullins who is the DST linkman will give all details of the programme thus far. Suffice it to say that several joint experiments between iThemba LABS and Dubna were conducted. Furthermore, areas of mutually beneficial programmes between iThemba LABS and JINR are being explored.

### **Election of new specialist group executive committee**

A new committee was elected at AGM of the specialist group which was held on 9 July 08.

The results of the election are as follows:

- Chairperson: Dr. Simon Mullins (iThemba LABS)
- Secretary: Dr. Noel Jacobs (Univ. of Stellenbosch)
- Industrial liaison: Prof. Simon Connel (Univ. of Johannesburg)
- International liaison: Prof. Steven Karataglidis (Rhodes)
- Webmaster: Mark Dalton (Wits)
- Outreach: Dr. Gillian Arendse (iThemba LABS)
- Student representative: J. Diener (Univ. of Stellenbosch)
- Future projects: Prof. John Carter (Wits) and Dr. Rob Bark (iThemba LABS).

### **General**

At the AGM Prof. Connel discussed the context of a letter he sent to the chairperson of the specialist group concerning opportunities for interaction of the research community with the nuclear industry via the Nuclear Industries Association of South Africa (NIASA). He mentioned the fact that cabinet has adopted a strategy to significantly increase the percentage of electricity generated via nuclear power stations. In pursuit of this goal cabinet has earmarked at least R 200 billion over the next 20 years. Prof. Connel expressed the opinion that the specialists group community should interact with NIASA and demonstrate to role players the role research has played in training current and future staff in the nuclear industry. He also felt there was a lot of research opportunities related to the nuclear industry for South African researchers. After some discussion it was decided that a committee should be constituted to actively engage with NIASA, selected members of the nuclear industry and government to create an interface with the specialists group community. The elected committee members are as follows: Prof. Simon Connel (UJ) (chairperson), Prof. John Sharpey-Schafer (UWC), Dr. Richard Newman (iThemba LABS), D.Singo (UCT/iThemba LABS), and S. Ntshanghase (UCT/iThemba LABS). It was also suggested that Prof. Robbie Lindsay (UWC) should be approached to serve on the committee.

Prof. Jean Cleymans introduced the South African-CERN programme that was recently launched. Prof. Cleymans is the chairperson of the programme. The current activities in the programme revolve around the ALICE detector (Large Hadron Collider) and ATLAS (Large Hadron Collider), the ISOLDE facility where radioactive ion beams are used to study materials, atomic and nuclear physics and HEP phenomenology. The programme received seed funding from the DST and a full business plan was submitted for approval. More detail can be found in reports above.

## **6.6. Physics Education (chair: Dr. Arendse)**

The PESG will be headed by Gillian Arendse (iThemba LABS) as Chair. He will be supported by Sam Ramaila (UJ) and Kevin Govender (SAAO) as Vice Chairs.

The primary and urgent task for the group is to carry out a detailed survey of all Physics Education Research taking place in South Africa and to establish links with these researchers and students. This will be a drive to re-invigorate the PESG in a climate when the number of contributions is at a low. This will entail examining other similar conferences and communities such as the South African Association for Research in Mathematics, Science and Technology Education (SAARMSTE) and the South African Association of Science and Technology Educators (SAASTE). From these efforts the PESG will compile a database of researchers and students involved in Physics Education Research and use it to draw more people to SAIP.

The PESG should, in conjunction with the LOC of SAIP, arrange for the involvement of local schools and education related activities at SAIP conferences.

The issue of membership and registration of educators was once again brought to the table. The PESG proposes that there be greater marketing towards getting high school science educators onto SAIP membership and that the registration fees for such educators attending conferences should be as low as possible.

## **6.7. Theoretical Physics (chair: Prof. Geyer)**

### **NITheP established during 2008**

Opening of NITheP in May 2008. Inauguration address delivered by Minister of Science & Technology, Mr Mosibudi Mangena; attended by Stephen Hawking and Nobel Laureates David Gross (who gave the inauguration lecture) and George Smoot.

International and local advertisement: Prof F Scholtz the first Director;  
deputy-directors at nodes: Profs F Pettrucione (UKZN) and J Rodrigues (UWits);  
first 3 researchers and 4 postdocs appointed.

Afman electronic structure workshop at AIMS after the conference, 14-25 July 2008; funded by NITheP, ICTP and Democritus Institute.

January 2008 Chris Engelbrecht Summer School on Soft Condensed Matter and Physics of Biological Systems – attended by 60 registered participants (seven lecturers); followed by week long workshop.

January 2009: Chris Engelbrecht Summer School focusing on Nuclei and Nucleonic Structures; some emphasis on Nuclear Astrophysics (venue: Stellenbosch NITheP/Institute for Advanced Study) details at [www.sun.ac.za/summerschool](http://www.sun.ac.za/summerschool).

## **7. Other Matters**

### **7.1. South African Journal of Science articles**

It was queried why the special issue of the SA J. Sci. comprising articles from the 2007 SAIP conference at WITs had not yet been published. HM explained that only 17 manuscripts were eventually submitted and was deemed by the editor not to be sufficient for a special issue. Furthermore, the student submission required considerable editing, and it was felt in general that so small a number of papers would not be representative of the conference. As a consequence, manuscripts would be processed as standard submissions and if accepted would appear in a standard issue of the journal.

### **7.2. SAIP Constitution**

NC brought to the attention of the specialist group chairs that a new SAIP constitution was in the process of being drafted, and that soon it would be required of each group to present their terms of reference in order that it be incorporated into the by-laws of the SAIP.

## **8. CLOSURE**

The Meeting closed at 22h00.

President: N. Chetty	Secretary: A. Forbes