

COMMISSION ON PHYSICS FOR DEVELOPMENT (C13)
Report for the Council and Commission Chairs Meeting, November 4-5, 2010
Kennedy Reed (Chair)

Meetings

A C13 meeting was held Aug 28, 2010 at ICTP. Invited guests included François Piuzzi, Chair of the European Physics Society (EPS) Interdivisional Group on Physics for Development, C14 Chair Pratibha Jolly, ICTP Director Fernando Quevedo, and Barbara Sandow, Chair of the IUPAP Working Group on Women in Physics.

C13 sponsored four Conferences in Developing Countries in 2010

1. **Palestinian Conference on Modern Trends in Mathematics and Physics II**, held at AN-Najah National University in Nablus, Palestine, August 2 - 4, 2010.
2. **African School on Electronic Structure Methods**, held at AIMS in Cape Town, South Africa, July 19-30, 2010.
3. **New Trends in Conducting Materials From Fundamentals to Applications**, to be held at Sousse, Tunisia, November 3-7, 2010.
4. **Sixth International Meeting on Photodynamics**, held in Havana, Cuba Jan 27 - Feb 5, 2010.

African Physical Society

C13 was a sponsor of the January, 2010 LAM9/EBASI7 Conference in Dakar, Senegal that included the launch of the continent-wide African Physical Society. C13 member Ahmadou Wague was the principal organizer of the Conference and is a vice president of the new African Physical Society.

Collaboration with C20 on Computational Physics Schools in Africa

C13 continues to collaborate with C20 on organizing a Computational Physics School Series in Africa. C20 member Nithaya Chetty (Univ of Pretoria) and C13 member Sandro Scandolo (ICTP) have been the lead organizers. The first of these schools, held July 19-30, 2010 in South Africa, was very successful and an article about it has been accepted for publication in the November issue of Nature Physics. Other major sponsors include ICTP, NITheP, SAIP, NRF, APS-DCOMP, and ICMR in Santa Barbara., USA. The International Advisory Panel has begun the groundwork for future schools which will be held biennially in different African Countries. (See the attached report on the inaugural school of this series.)

Visiting Scientist Program

C13 has been working to implement the Visiting Scientist Program. The Program Description is on the IUPAP web site at <http://www.iupap.org/conferences/VisitingScientistDescription.html>.

Article on C13 Published

An article on C13 is being published in the Bulletin of the Federation of Latin American Physical Societies (FELASOFI). (See attached article)

**African School on Electronic Structure Methods and Applications (ASESMA)
Muizenberg, Cape Town 19- 30 July 2010.
The inaugural school in the biennial series planned for 2010-2020**

ASESMA-2010 was not just a two week school. It was the start of an ongoing network for interaction and collaboration. By all accounts, it was a fantastic success. Much of the enthusiasm of the students was due to an innovative program of mentors, motivated young scientists mainly at the post-doctoral level, who worked with the participants one-on-one throughout the school. Since the school they have contacted each, set up web pages, a monthly electronic newsletter (two editions have been posted), and a Facebook page. Links are given below. The participants, mentors and lecturers are enthused and now is the real test – to keep the interactions and collaborations going into the future.

* There is also enthusiasm for the continuing Series of Schools. An illustrious International Advisory Panel will help the Series stay focused and active. Several countries are possibilities for the hosting the site for the 2012 school, and the choice will be made soon.

* At the 2010 School there were 45 participants (in addition to the 6 mentors) from many countries in Africa: Cameroon, Congo, Ghana, Ethiopia, Kenya, Nigeria, South Africa and Zimbabwe. Many of the South African students were actually nationals from other African countries, so the school served a large number of graduate students and young faculty. (See photograph below.)

* The topic of the Series of Schools is theory and computational methods for predicting and understanding properties of materials through calculations at the fundamental level of electronic structure. This is a growing field in which scientists with limited resources can have a large impact. A personal workstation is sufficient for many problems and the internet is making possible productive use of large computational facilities. It is within reach to create electronic structure community in Africa working at the level of forefront international research.

* The content of the 2010 School was a combination of theoretical background and hands-on calculations using workstations and every student ran a calculation at the Centre for High Performance Computing in Cape Town, a facility meant for all Africans. A great effort was made to have coordinated talks on theory, computation, and on a phase transitions under pressure, a not-so-simple example of problems in minerals and geophysics. The CHPC management invited each participant to apply for a user account which they can use from their home countries.

* The range of international experts who lectured at the School was impressive. The School schedule can be found at <http://users.aims.ac.za/~sandro/>, which includes a link to the School photos.

* Support by IUPAP, especially C13 and C20 commissions was essential for international recognition of the series and for financial support of the 2010 School.

* A key role was played by the International Centre for Theoretical Physics in Trieste. Without their financial support the school could not have occurred. Probably more important were the scientists from Trieste, the ICTP, Democratis Italian Simulation Center, for their tremendous efforts at facilitating the use and easy access of the excellent Quantum Espresso codes, for making these freely available, and for coordinating the lectures.

* The mentors were funded by the International Center for Materials Research (ICMR) in Santa Barbara with strong support by Prof. Nicola Spaldin. The mentor program was the innovation that helped students on a one-on-one basis. This helped improve the pace of the delivery as the participants were able to work independently. Each participant was able to progress based on his/her own abilities.

* There was excellent administrative support for the School by Milena Poropat (ICTP) and Linette White (South African Institute of Physics).

* The Centre for High Performance Computing in Cape Town has given all participants of the School access to their Blue Gene, which was donated by the IBM for African collaborations. The QE computations and collaborations could well be the first truly African-wide research activity on this facility.

* The African Institute for Mathematical Sciences (AIMS) provided a fantastic venue and backdrop for the hosting for ASESMA2010. The accommodation, catering, lecturing and computing facilities are excellent. For your information, the Canadian government has recently donated Can\$20m for the establishment of a network of AIMS centres in Africa that will include Ghana, Nigeria, Senegal, Ethiopia and South Africa, which is excellent news.

The next steps:

* Some participants have projects to work on, and are exploring ways in which Quantum Espresso can be used in their current work. Others are exploring new projects, and the networking and further mentoring and support will assist to accomplish this.

* Networking and continuing with the work and projects post-School is now a critical issue. A monthly electronic newsletter is underway coordinated by Alison Hatt (ICMR, Santa Barbara) has agreed to act as editor.

* A more permanent website is being set up, hosted by the ICTP. The current School website is located at <http://www.nithec.ac.za/>

* A facebook page has been established

<http://www.facebook.com/?ref=logo#!/group.php?gid=145558648789192>

* A portrait gallery with contact information has been created.

<https://sites.google.com/site/asesma2010/>

* Nature Physics has agreed to publish a 2000 word commentary on the School.

* We are analysing questionnaires and feedback forms from the participants to help us improve on future Schools, and to understand better the needs for Africa.

* The venue for the 2012 School will be announced by Richard Martin, the chair of the IAP. A number of countries are currently bidding to host the School. Securing further international funds for the 2012 School will be an important challenge for these next two years, and we will count on your assistance in this regard.

There is still a long journey ahead, but the 2010 School has made an excellent start, and the foundations are in place for us to build for the future. Creating an internationally credible electronic structure community in Africa is within our reach. The consequences of this will be extremely important for the development of science in Africa.

Nithaya Chetty (University of Pretoria, South Africa)

Richard Martin (University of Illinois, USA)

Sandro Scandolo (International Centre for Theoretical Physics, Trieste, Italy)