



African School of Physics (ASP2012) – Forum/Outreach Day
Saturday July 28th 2012 @ International Center for Innovative Learning (ICIL)
Kwame Nkrumah University of Science and Technology (Kumasi)

In the framework of the ASP2012, we propose a special forum/outreach day addressed to the scientific personnel and the government officials of Ghana. Throughout the 3-week long school of physics, students are learning variety of topics, including Theoretical Subatomic Physics, Experimental Subatomic Physics, Accelerators and Technology, Information Technology and the GRID. As a complement to this event, we propose to take the opportunity provided by the key-visiting experts to connect with scientific experts and Ghanaian Government. The abstracts of the talks are available in Appendix 1.

There will hopefully develop pockets of capacity from which the HEP footprint in Africa can be expanded. During the Forum Day, we would like to:

- 1) discuss the education and capacity building in Ghana. The strategic planning on the local and central governments of Ghana towards capacity building.
- 2) have a poster presentation by the students of ASP2012.

Agenda

**** Starting at 10:00 - Introduction remarks and ASP2012**

By Dr. Christine DARVE (ESS, SE) and Dr. Ketevi ASSAMAGAN (BNL, USA/SA)
 By Dr. Peter AMOAKO-YIRENKYI (KNUST, GH) and By Prof. DONTWI (NIMS, GH)

- 1. Address from the Ghana Officials – Research and Education**
 By Prof. William Otoo ELLIS (Vice chancellor - KNUST, GH)
- 2. Address from the Ghana Officials – Policy Leader (20')**
 By Prof. Mahama DUWIEJUA (Executive Secretary for National Council for Tertiary Education, GH)
- 3. Physics and its Medical Applications in Africa (20')**
 By Prof. Zebulon VILAKAZI (Director - iThemba LABS, SA)
- 4. The Transformation and Re-shaping of Physics in SA (20')**
 By Prof. Simon CONNELL (President - South African Institute of Physics, SA)

Break

5. The Road Map for Discoveries – The Large Hadron Collider and the Higgs Boson (20')
By Prof. Albert DE ROECK (Senior Scientist - CERN, CH)

6. The Road Map for Discoveries for Africa (20')
By Prof. Herman WHITE (Senior Scientist - Fermi National Accelerator Lab., USA)

Lunch break

7. The SESAME Project and the Impact of Synchrotron Radiation on Science and Society in Developing Countries (20')
By Prof. Herman WINICK (LCLS Ass. Director - SLAC National Accelerator Lab., USA)

8. The Road map of Applied Physics with compact accelerator based systems (20')
By Luca SERAFINI (Senior Scientist – INFN, IT)

9. Raising Hope and Scientist: Building School in Africa (10')
By Rickard PERSSON (Director - Positive Footsteps, SE)

Student Posters and Opened sessions (See Appendix 2)

18:00

ASP2012 banquet

Traditional Drumming and Dancing by Agya Koo Nimo

Appendix 1

Abstracts of the Scientific Lectures

Physics and its Medical Applications in Africa

By Prof. Zebulon VILAKAZI (Director - iThemba LABS, SA)

Chief among its activities is the operation of a k=200 separate sector cyclotron which provides proton beams of energies up to 200 MeV. These beams are used for fundamental nuclear physics research in the intermediate energy region, isotope production and medical physics applications. The main emphasis of the latter is the neutron and proton therapy treatment programme. To this end, iThemba LABS is the only hadron therapy centre in Africa and in the Southern Hemisphere and one of the very few (in not the only) centre where patients can be treated with high-energy neutrons and protons. Patients from all over South Africa as well as neighbouring countries have been treated on these facilities. Currently, plans are in advance for the extension/upgrade of the facilities to include a dedicated radiation treatment centre. In this presentation I will outline details of the programmes (in nuclear and medical physics research) and give outlook on the role iThemba LABS will play in the area in accelerator bases sciences – both in the Country and the rest of the African continent.

The Transformation and Re-shaping of Physics in SA

By Prof. Simon CONNELL (President - South African Institute of Physics, SA)

This talk reviews the history of Physics in SA. Its a colonial history, but it is followed by a period of great hope and a trajectory of growth.

Our history exhibits the exclusion of the majority from full participation due to the apartheid policies practiced until 1994. With the advent of democracy, there followed a very successful process of transformation. This was not enough to ensure the success of the discipline. At the same time, there was a world-wide slump in attracting new young talent and funding into physics. More was necessary. Together with the government, the physicists themselves assessed their profession and developed recommendations, together with the help of international colleagues. These recommendations have been implemented. Physics in South Africa now experiences unprecedented growth and optimism for the future. South Africa would like to build its networks within Africa, to participate in the African scientific renaissance, and the full contribution to the global science collaborative effort. What may yet come out of Africa?

The Road Map for Discoveries – The Large Hadron Collider and the Higgs Boson

By Prof. Albert DE ROECK (Senior Scientist and Prof. - CERN, CH)

The Large Hadron Collider, at CERN, Geneva, Switzerland is one of the first truly global scientific instruments. We will discuss shortly the recently discovered Higgs boson, and the road that was followed in the last 30 years to achieve this. It required in particular the development of cutting edge technologies both for the machine and the detectors. Africa is starting to play a role in this scientific revolution, and there is a lot of room for further expansion and participation.

The Road Map for Discoveries for Africa

By Prof. Herman WHITE (Senior Scientist – Fermi National Accelerator Laboratory, USA)

The value of discovery science can be easily seen in the impact of basic research on education, infrastructure, international collaborations and contributions to human kind.

A roadmap will be presented that discusses a few recent discoveries associated with High Energy Physics that are becoming an important part of the way nations plan to go forward.

The SESAME Project and the Impact of Synchrotron Radiation on Science and Society in Developing Countries

By Prof. Herman WINICK (LCLS Assistant Director - SLAC National Accelerator Lab., USA)

At present there are more than 60 synchrotron radiation light sources in operation in 20 countries around the world, with more in construction and design (see: www.lightsources.org). Although most facilities are in technologically advanced countries, there is significant activity in the developing world. Light source projects in Brazil, Korea, and Taiwan have been in operation for more than 15 years. The value of these projects has resulted in the funding of newer, higher performance facilities in each of these countries. SESAME, a UNESCO sponsored project, modeled on CERN, is constructing a light source in Jordan as a collaboration involving nine Middle East countries (www.sesame.org.jo). It has been called a "model project for other regions."

The Road map of Applied Physics with Compact Accelerator Based Systems

By Prof. Luca SERAFINI (Senior Scientist – INFN, IT)

Particle Accelerators played a crucial role in science over the last century both in developing fundamental knowledge and in pushing applications of high social impact as by-products of the technologies in turn developed to fulfill High Energy Physics requirements. We will give a few examples of how compact and moderate costly accelerators may have a crucial role in countries under development to stimulate the growth of knowledge and expertise at University campus level, exploiting emerging technologies in the field of advanced radiation sources for use in medicine, biology, material science and, eventually, nuclear applications.

Raising Hope and Scientists: Building School in Africa

By Rickard PERSSON (Director - Positive Footsteps, SE)

The access to the scientific knowledge starts with raising youth kids in a friendly environment. We will introduce here the effort of a small foundation dedicated to build new school infrastructures in Africa. This effort was successful in Guinea, soon in Gambia, and has been initiated in Ghana.

Appendix 2

List of the ASP2012 student poster

	Name Of Student	Title of Poster	University and Country
1	Marius Tchonang	The Study of a Diamond Bearing Rock Sorter: Mineral-PET	University of Johannesburg, Johannesburg, South Africa
2	Sokhna Bineta Lo Amar	GEANT4 and Pion Photo-Production at JLab in the 0.5 ~ 3GeV Energy Range	University Cheikh Anta Diop, Dakar, Senegal
3	Ntombizikhona Beulah Ndlovu	Biological Monitoring of Air Pollution With Plants: Results From a Pilot Study In The Western Cape, South Africa	Stellenboch University, Merensky Building, Matieland, South Africa
4	Albert R. Djomegni,	Electron Spectroscopy of Lead Using Synchrotron Radiation	Department of Physics, University of Oulu, Oulu, Finland
5	Suzan. P Bvumbi	New E1 transitions in the rare isotones ¹⁵⁰ Sm and ¹⁵² Gd	University of Johannesburg, Johannesburg, South Africa
6	C.K. Bandoh	Investigation of Optical Properties of Zinc Sulphide (ZnS) Thin Films Deposited by Chemical Acidic Bath	Kwame Nkrumah University of Science and Technology, Kumasi , Ghana.
7	M. E. Elbasher	Developing and Test of Fast Neutron Detectors Array for Spectroscopy	Stellenboch University, Merensky Building, Matieland, South Africa
8	Ojuh Divine Osamiromwen	Electronic Structure and Properties of Ternary Alloy B _x In _{1-x} N in Zincblende Structure	Benin
9	D. Boye	Photons Angular distribution of Atomic hydrogen with linearly and elliptically polarization light: Occurrence of real terms contribution in the dichroism.	University Cheikh Anta Diop, Dakar, Senegal
10	M. I. Kaniu	Scatter Techniques in X-Ray Fluorescence Characterization of Materials	University of Nairobi, Kenya

11	Mohamad Lalegani Dezaki	Moving Single Bubble Sonoluminescence in a High Viscous Liquid	Isfahan University of Technology (IUT), Isfahan, Iran
12	Mark Paal	Investigation of Optical Properties of Cadmium Sulphide Thin Films Deposited by Chemical Bath Method.	Kwame Nkrumah University of Science and Technology, Kumasi , Ghana.
13	MAÏMOUNATOU Boubakari	Rotating Crystal Method : Coupling of the Raman Bare Polar Modes in a Single Crystal of Lithium Niobate	University of Douala, Cameroon
14	A. C. Nwanya	Synthesis and Comparative Analysis of Samples of Dye Sensitized Solar Cells using TiO ² films and Natural Dyes	University of Nigeria, Nsukka, Nigeria
15	D. A. Unwuchola	BARYON-OMEGA MESON ELECTROPRODUCTION	University of Johannesburg, Johannesburg, South Africa
16	Joseph Asare	Mechanical Characterization of Bendable Organic Photovoltaics	African University of Science and Technology, Abuja, Nigeria
17	V. W. Kivaya	Air particulate pollutants study: A Kenyan perspective	University of Nairobi, Kenya
18	Youssou Gning	Assessing Computational Scilab Program in Complex Rotation Method for Calculations of Resonance Parameters ^{1,3} P ⁰ Doubly Excited States for Helium Like Ions	University Cheikh Anta Diop, Dakar, Senegal
	Akyana Britwum	Magnetostriction of First and Second Order Magnetite Samples and the relation to the Magnetic Easy Axis Switching	Kwame Nkrumah University of Science and Technology, Kumasi , Ghana.