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**Contributions from readers are welcome on any matter relevant to the mission of COMSATS, namely the promotion of South-South cooperation in science and technology for sustainable progress of the developing countries. The responsibility for the accuracy of any information rests with the original source. Views expressed in this publication do not necessarily reflect those of its editors, publisher or COMSATS.**

*E.D. COMSATS presenting 'COMSATS' Shield' to the Sudanese State Minister for Science and Communication during his visit to Sudan (Page 2)*

## Inside this Issue



## From the Executive Director's Desk

The Gregorian year 2012 came to a close with political and security upheavals in the Middle East, increased natural and man-made calamities, unabated terrorist activities by non-state actors and financial crises breeding across the globe. A much hyped United Nation's Conference on Sustainable Development 2012 (Rio+20) failed to achieve its targets with a minor consolation that the sustainable development goals gained currency in development discourse and new elements, such as poverty eradication and social inclusion, were included in its broadened scope. This aspect of the conference outcome is significant, considering that as the cycle of Millennium Development Goals runs its course by 2015 with many Goals still remaining unfulfilled for the majority of countries, the World's poor would not be left at the mercy of Green Economy corporate Shylocks. Other debacles to world peace and prosperity during the course of the year 2012 included the continuation of overt and covert military operations in violation of International Law, cyber attacks, religious provocation in social media under the pretext of freedom of expression, and erosion of confidence in the current world economic order. In short, the World is not better off with respect to a number of human development parameters, when applied to the majority of mankind.

Science and Technology, as usual, has continued to provide the silver lining with outstanding achievements, such as the discovery of a new particle which is most likely the Higgs boson, soft landing of 'Curiosity' rover (Mars Science Laboratory) on the surface of Mars, better understanding of the functional aspects of human genetic code, precision manipulation of animal genes, and stem cells reprogramming. The expanding horizon of human knowledge is not only a tribute to the professionals dedicated to creative ventures, but also a matter of pride for the nations that invest their human and material resources for the pursuit of this cause. These achievements ultimately yield economic and political dividends for such nations.

From the perspective of COMSATS, last year has been exceptional in breaking new ground for the realization of its objectives. The representatives of the Heads of Government/State of COMSATS' member countries met in Islamabad and renewed their commitment towards mutual cooperation in S&T sector for achieving their developmental targets. Elsewhere in the World, through the platforms of political organizations and scientific bodies, an increased emphasis on South-South

*continued on page 3*


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# NEWS/ACTIVITIES/HIGHLIGHTS FROM COMSATS SECRETARIAT

## THE EXECUTIVE DIRECTOR COMSATS VISITS THE REPUBLIC OF SUDAN

In view of its dual roles as the Secretariat of COMSATS' Commission and the Headquarters of the Network of Centres of Excellence, the COMSATS Secretariat has to remain engaged with the national focal points of the member States and the administration of the Centres of Excellence, in order to implement the organization's programmes for science-led socio-economic development. One of the important means in this regard has been the Executive Director's visits to the member States and the affiliated Centres of Excellence. The most recent of these visits was made to the Republic of Sudan, in conjunction with the participation in the sixth Islamic Conference of Ministers of Higher Education and Scientific Research (ICMHESR), under an invitation from ISESCO.

As per standard practice, prior to the Executive Director's visit, the relevant foreign mission in Pakistan was consulted and a meeting with the Ambassador of the Republic of the Sudan, H.E. Mr. Al-Shafie Ahmed Mohamed, held on November 15, 2012. The visit to Sudan had three important components: meetings with relevant Sudanese Government officials; visit to COMSATS' Centre of Excellence in Sudan and participation in the ICMHESR. A short account of the Executive Director's activities is as follows:

*ED COMSATS inspecting lab facilities with DG IRCC*

### Meetings with Relevant Government Officials of Sudan

The Executive Director visited the Ministry of Science and Communication on 21st November, and held meetings with the State Minister, H.E. Dr. Tahani Abdalla Attia Gasmalla, and the Under Secretary of the Ministry, Mr. Zuhair Alfadil Alabjar. Also present on the occasion was Mr. Ahmed Obeid Hassan, the Coordinator of the National Programme on Bio-Fuels under the Ministry.

The discussions with the Under Secretary involved reviewing the follow-up of past consultations and the support provided to Sudanese scientists in the form of their participation in COMSATS' sponsored capacity-building events in Sudan as well as in other Member States. The Under Secretary was informed that COMSATS has organized 7 training workshops and conferences in Sudan since 2004, covering the fields of bio-fuels, bio-technology, ICTs and maintenance of scientific equipment. So far, sixteen Sudanese scientists have travelled abroad on COMSATS' grants for training or participation in scientific events organized by COMSATS. The generous financial support in the form of Annual Membership Contribution by the Government of Sudan was gratefully acknowledged by the Executive Director. The Under Secretary assured the Executive Director that Sudan recognizes the benefits of its association with COMSATS and would continue to provide administrative as well as financial support.

The discussions with the Under Secretary were followed by a formal meeting between the Executive Director and the Minister of State for Science and Communication, H.E. Dr. Tahani Abdalla Attia Gasmalla. The State Minister was informed that Sudan has been actively participating in COMSATS Coordinating Council meetings since the induction of the Industrial Research and Consultancy Centre (IRCC) of Sudan as a Centre of Excellence. The Executive Director elaborated upon three modes of support offered by COMSATS under the categories of Education, Training and Research. In particular, he invited the honourable Minister to take maximum benefit of COMSATS' International Thematic Research Groups, under which currently the research is being undertaken in three areas – ICTs, Climate Change and Medicinal Plants. The Minister showed keen interest in all these fields and also conveyed the interest of her Government to expand Sudanese capacity in the cutting-edge fields, such as nanotechnology. The State Minister expressed her confidence that Sudan will be able to contribute strongly towards COMSATS' international programmes aimed at socio-economic development in Member States through South-South cooperation in Science and Technology.

### Visit to COMSATS' Centre of Excellence in Sudan

A visit to the Industrial Research and Consultancy Centre (IRCC) in Khartoum, Sudan, was undertaken by E.D. COMSATS on 22nd November 2012, following an invitation received from the Director General IRCC, Dr. Azhari Mohamed Elbadawi. The facilities inspected during the visit to the Centre included, mechanical workshop; analytical measurements laboratory; chemical testing and research laboratory; food testing and research laboratory; and industrial documentation and publication centre. Dr. Qureshi was informed that the Centre serves as an Engineering Faculty for Sudan's Academy of Sciences, which is a post-graduate degree-awarding institution.

Indicating a dire need of financial support to undertake up-gradation of instrumentation and renovation of IRCC laboratories, the Director General expressed his desire to attain a quality level as that of some of the private-sector establishments, such as Capo Dairy Industry and Amipharma. A visit to these industrial complexes located in industrial zone of North Khartoum was organized to acquaint the Executive Director about the high industrial standards achieved by some companies, which benefitted from the consultancy by IRCC. Among various agreements that were made on this occasion was the decision to hold a Workshop on Repair and Maintenance of sophisticated equipments to be held in 2013, in collaboration with ISESCO. The Executive Director emphasized the need for IRCC to actively participate in COMSATS' International Thematic Research Groups.

*Expert imparting training on repair and maintenance during the Tunisia workshop*

**Participation in ISESCO Ministerial Meeting**

The sixth ICMHESR was held on 20-21 November 2012, in Khartoum, Sudan. On invitation from ISESCO, the Executive Director COMSATS, Dr. Imtinan Elahi Qureshi participated in the meeting. This year the theme of the meeting was "The role of Higher Education in the development of Science and Technology for a prosperous future". The meeting, inter alia, considered a report on "Key Performance Indicators (KPI) for Universities in Islamic Countries". As a follow up of the Extraordinary Session of the ICMHESR held on 4-5 October, 2011, in Riyadh, Kingdom of Saudi Arabia, a guide for "Assessment and Quality Enhancement for Universities in the Islamic World" has been prepared for improving their Key performance Indicators. The delegates, in general, expressed their resolve to increase the access to higher education and enhancement of expenditure on education to compete with knowledge economies of the world. At the end of 2-day's deliberations, a Khartoum Declaration was issued which laid stress on the establishment of world-class facilities for conducting research on new and emerging areas of critical importance; completion of the project 'Atlas of Islamic World Innovation'; establishment of ISESCO Chairs for women scientists in member states; and expansion of higher education sectors in all member states.

In his statement read out before the august gathering, Dr. I.E. Qureshi highlighted the S&T capacity building programmes that were conducted by COMSATS in collaboration with ISESCO, during the past two years. Dr. Qureshi informed the audience that COMSATS Institute of Information Technology (CIIT) has been ranked at 9th position among 124 universities of Pakistan, and invited OIC countries to make use of the offer of scholarships for graduate studies at CIIT.

## COMSATS-ISESCO WORKSHOP ON REPAIR AND MAINTENANCE OF SCIENTIFIC EQUIPMENT HELD IN TUNISIA

In continuation of the series of workshops on "Repair and Maintenance of Scientific Engineering Equipments in

*contd. from page 1 ... 'From the Executive Director's Desk'*

cooperation was witnessed. Thus, the events in 2012 have borne out the crucial importance of S&T capacity building and the desirability of its achievement through joint efforts by developing countries. The COMSATS' strategy for the next few years is premised on the realization of multilateral cooperative research efforts. For this purpose a programme entitled, 'International Thematic Research Groups' is underway to jointly pursue specific research projects with groups of scientists belonging to different member countries. These groups working under the patronage of COMSATS are expected to yield significant research output in coming years, with hopefully tangible benefits to its member countries.

COMSATS' role as a facilitator of bilateral and multilateral cooperative scientific activities would be greatly enhanced if member States make good on their pledges of financial support undertaken during the 2nd Commission meeting. An endowment fund of US $10 M, as agreed during that meeting, is necessary for the success of on-going projects. It is hoped that this target will be achieved for the collective benefit of COMSATS' world-wide community.

The next volume of this Newsletter is planned to include new features. Any suggestions in this regard from esteemed readers are most welcome.

Universities, Research Institutions and Small Scale Industries" COMSATS jointly organized the event in 2012, benefitting more than thirty (30) participants. These included engineers, scientists and teachers from different cities of Tunisia. The event was the 6th workshop on the same theme that started back in Sudan in 2004 followed by similar national events in Syria, Senegal, Sudan and Egypt. The number of individual beneficiaries in COMSATS' Member States, who have received the relevant hands-on training on repair and maintenance of various scientific instruments and passed on the fruits of their learning to their parent institutions, has now exceeded 180. The repair and maintenance workshops organized by COMSATS aim to build indigenous capacities for upkeep of important scientific instruments and thus cutting the maintenance costs and reducing dependence on foreign experts.

This year the workshop was held on December 10-14, 2012, at Nabeul, Tunisia, in collaboration with the Islamic Educational, Scientific and Cultural Organization (ISESCO) and the Tunisian National Commission for Education, Science and Culture (TNC), under the COMSATS-ISESCO Cooperation Programme (2012). Higher Institute of Technological Studies (ISET) of the Ministry of Higher Education and Scientific Research, Government of Tunisia, hosted this national workshop that helped the participants to learn latest repair and maintenance techniques and build relevant capacities by training a master-trainer for maintenance of expensive scientific equipment used in the academic and research institutions of Tunisia.

*The 23rd meeting of Board of Governors being presided over by the Executive Director COMSATS*

Two subject-experts from the Pakistan Council of Scientific and Industrial Research (PCSIR), Pakistan, Mr. Arif Karim and Mr. Faisal Ghazanfar, and one local expert, Mr. Abidi Hatem from ISET, imparted training to Tunisian scientists, engineers and teachers during 10 technical sessions of the workshops on various topics including: Spectrophotometer Systems; XRF-Systems; Atomic Absorption System; PCR Systems; Gas Chromatographic Systems; HPLC Systems; Mass Spectroscopy; Mass Detectors and Mechanics and Thermal Analyzers. The sessions also comprised lectures that complemented the hands-on training in labs of ISET. Using the knowledge and techniques learnt during the workshop, the participants successfully repaired/made operative a number of expensive and important equipment lying out-of-order. The equipments that were fully repaired included: Three Dimensional Measuring Machine – CMM; Ultrasonic Tester; Micro-Milling; Bench of flow Control and Bench of Simulator TV defects; while problems were also identified in a number of other faulty equipments.

The inaugural ceremony of the workshop was held on December 10, 2012. Dr. Mohammed Khlifi, Secretary General of the Tunisian National Commission; Mrs. Wafaa El Alami, Head of ISESCO Centre for Promotion of Scientific Research (ICPSR); Dr. Foued Lindolsi, Director of ISET; and Mr. Nisar Ahmad, Senior Assistant Director COMSATS represented their respective organizations at the Inauguration. During the concluding ceremony, held on December 14, 2012, the participants expressed their gratitude to ISESCO and COMSATS for organizing the workshop and providing a good opportunity for learning and enhancing technical expertise.

## THE EXECUTIVE DIRECTOR COMSATS PRESIDES OVER THE 23RD BOG MEETING OF CIIT

The 23rd meeting of the Board of Governors of COMSATS Institute of Information Technology (CIIT) was held on 26th December 2012, at its Islamabad Campus. In addition to the members of the Board belonging to CIIT, the meeting was attended by external Board members, Mr. Anwar H. Rammal of Asiatic Publications Network Karachi and Mr. Najeeb Khawar Awan, Additional Secretary, Ministry of Science and Technology, as well as Dr. Muhammad Yasin, Former Chairman Pakistan Telecommunication Authority (P.T.A.). The Executive Director COMSATS and Chairperson of the Board presided the meeting. Dr. S. M. Junaid Zaidi, Rector CIIT, gave a detailed presentation on overall progress, future plans and achievements of CIIT. The Board appreciated the Institute's achievements and its position as No. 1 institute of higher learning in the category of 'Computer Science and Information Technology' and among the top 6 universities of Pakistan in terms of research productivity according to the 2012 ranking of Higher Education Commission of Pakistan. The Board also emphasized the need of research and development, industrial linkages, as well as innovation and commercialization.

Among the important decisions made during the meeting was the approval of creation of one position of 'Pro-rector' and a draft bill to rename the Institute as 'COMSATS University', which will be enacted after the approval of the Parliament.

# ACTIVITIES/NEWS OF COMSATS' CENTRES OF EXCELLENCE

## CIIT-PAKISTAN HOLDS FIT 2012

COMSATS Institute of Information Technology (CIIT), in collaboration with the Pakistan National ICT R&D Fund, National Testing Service, and Higher Education Commission (HEC) of Pakistan, organized the 10th International Conference on Frontiers of Information Technology (FIT-2012), on December 17-19, 2012, in Islamabad, Pakistan. The technical sponsors of the Conference were IEEE, IEEE Computer Society, and IEEE Industrial Electronics Society. The Conference has been organized annually for the last ten consecutive years. The aim of this conference is to provide the stakeholders a networking opportunity, as well as a forum for sharing state-of-the-art research in the area of Information Technology. This year's conference was given the theme 'Information Technology in Human and Social Perspective'.

The technical proceedings of the Conference were spread over 29 technical sessions, chaired by the renowned academicians. CIIT received a total of 286 papers from 564 authors belonging to 30 different countries. A total of 33 invited talks were delivered on the latest trends in the areas of computing and electrical engineering. These sessions also included; student and industrial project exhibition; 5 PhD symposia; 64 technical papers and 4 tutorials, 36 talks of renowned international and national speakers from leading universities and presentations for CIIT's Best IT Innovation Awards. Subject-experts and speakers from Austria, Canada, China, Ireland, Kuwait, Pakistan, Qatar, Scotland, UK, and USA, deliberated on key issues relating to the theme of the Conference.

*A technical session of FIT 2012 in progress*

## SAICON 2012 ORGANIZED BY CIIT

On December 5-7, 2012, CIIT and the South Asian Chapter of the Academy for Global Business Advancements (AGBA) organized the 4th South Asian International Conference (SAICON) 2012 on December 5-7, 2012. Held in Bhurban, the scenic city of Pakistan, this year's conference was given the theme: International Emerging Knowledge Economy in the 21st Century: Opportunities & Challenges. With a view to link the academia and research with the industry and promote research in the South Asian sub-continent, the Conference aimed to provide knowledge, services and leadership that promote adopting best practices and new business models; disseminating information on cutting-edge business issues; and promoting joint research.

The opening session of the event was held on December 5, 2012, which comprised two keynote addresses, by Dr. Andrew Stark, Coutts Professor at Manchester Business School, UK; and Mr. Saad Amanullah Khan, Chief Executive Officer, Gillette Pakistan. Earlier, Dr. Qaisar Abbas, Dean Faculty of Business Administration CIIT, delivered the Welcome Address.

One hundred and forty five subject-experts and students from Australia, China, Germany, India, Malaysia, the Netherlands, Nepal, Pakistan, Saudi Arabia, UK, and USA, made presentations on a broad spectrum of topics relating to management, finance, marketing, technology management, human resource management, climate change, and economics.

Additionally, four invited talks were delivered by Industry and Academia leaders during the proceedings of the event. These were: 'Exploring the Role of Theory in Research: The Case of Accounting Theories' by Dr. Saeed Akbar, Liverpool University, UK; 'Growth of Social Media and Marketing: Issues and Challenges' by Dr. Ahmed Jamal, Cardiff Business School, UK; 'The Role of BRICS in the Emerging Market Growth Prospects: Does Indian Growth Matter for Pakistan' by Dr. Ahmed M. Khalid, Bond University, Australia; and 'Ethical Standards in Business and Finance: An Islamic Perspective' by Mr. Akmal Hanuk, Chief Executive, Islamic Banking and Finance Centre (IBFC), UK.

A highlight of the concluding ceremony, held on December 7, 2012, was a panel discussion on the theme of SAICON 2012. The discussion was moderated by the Executive Director COMSATS, Dr. I. E. Qureshi, and had the following panelists: Dr. Andrew Stark, Manchester Business School, UK; Dr. Bahauddin Mujtaba, Nova South Eastern University, USA; Dr. Ahmed M. Khalid, Bond University, Australia; and Dr. Ahmed Jamal, Cardiff Business School, UK. Speaking at the concluding session, Dr. Qureshi considered business related activities as having a strong bearing on the socio-economic conditions of the societies. "The global organized business", he opined "has not promoted equity and reduction in human suffering. It has strengthened disparities, exploitation and accumulation of wealth".

The participants of SAICON 2012 shared information on

their cutting-edge research, conceptual frameworks, business ideas, proposals and projects, as well as business tools and technologies.

## RECENT ACTIVITIES OF IRCC-SUDAN

During the reporting period the Industrial Research and Consultancy Centre (IRCC), Sudan, prepared feasibility study for the establishment of a leather products complex in western Darfur State. The proposed project is targeting unemployed graduates and small-scale industry.

A Memorandum of Understanding was signed with Salha Company for traditional gold mining. According to the agreement, IRCC will handle the technical training and maintenance of metal detectors. Also collaboration took place with department of bottled water industry to review bottled water plant layout and water source specifications.

Preparations are underway at the Centre to hold a workshop on repair and maintenance of scientific equipment expected to be held during March-April 2013, under the patronage of ISESCO and COMSATS. COMSATS offered a 3-week training course on operations, maintenance and calibration of gas-chromatograph and atomic absorption to a technician from IRCC at ICCB Pakistan. IRCC technician is currently pursuing the training.

## "IJERA" EC FUNDED PROJECT CONCLUDED AT RSS-JORDAN

The Environment Monitoring and Research Central Unit (EMARCU) of Royal Scientific Society (RSS) of Jordan held the final conference for the project "Integrating Jordan into the European Research Area (IJERA)".

The IJERA project has been funded by the European Commission (EC) and was coordinated by RSS. The project brings together three partners namely; the Higher Council for Science and Technology from Jordan, Europe for Business (EFB) from the United Kingdom, and ENEA from Italy. The project was implemented over a period of 24 months with the purpose of strengthening the capacities of EMARCU at RSS while recognizing it as an international centre of excellence in water research. Additionally, the identification of water research priorities needed in order to respond to socio-economic needs was achieved.

Under the project, partners worked extensively with the public institutions in the research field to reinforce the cooperation capacities and research activities in Jordan's water sector, as well as facilitating Jordan's participation in European water research initiatives and inclusion in Euro-Mediterranean Research and Innovation Areas.

The final conference presented the project's outputs and the impact it made in the field of water research in Jordan. The inaugural session of the conference welcome address by Engr. Fida' Jibreel, Director EMARCU, which was followed by several presentations related to cooperation between the European Union & Mediterranean partner countries. The topics included: Research in Jordanian Water Sector; Capacity Building for Solving Specific Water issues; ERA-wide projects in the region; and, Water Innovation for Jordanian SMEs: Challenges & Opportunities.

The conference was graced by the presence of the European Commission delegation to Jordan which signifies the positive relations and partnership between the EC and Jordan. The EU believes in research and innovation as a base for development, and therefore extends its support to its partners in these sectors. It is worth noting that RSS is the largest applied research, consultation, and technical support service provider in Jordan, and is a regional leader in the fields of science & technology.

RSS has established itself as a pioneer within the broader international scientific community and is continuously striving to improve its standing as a reference point of scientific knowledge and technical awareness, where quality standards and public health are highly important and totally uncompromised. RSS is unequivocally commitment to testing with guaranteed accuracy, and is dedicated to research and development, which affects people's lives in a meaningful and sustainable manner.

## DIFFERENT SCIENTIFIC EVENTS ORGANIZED BY BCSIR-BANGLADESH

In order to expand and establish a strong research network, BCSIR has been engaged in organizing a number of seminars during the last quarter of 2012, these included:

- A day-long seminar on Scientific and Technical Cooperation between European Union (EU) and Bangladesh, held on 26th October 2012.
- The 22nd Bangladesh Science Conference on the role of scientists and technologists to achieve the MDGs (27 – 29 October 2012). The focused theme of the conference reflected the involvement of the scientists and technologists in meeting the Millennium Development Goals. Bangladesh Association for the Advancement of Science (BAAS), and scientists, engineers and technologists from different avenues of science participated in the event.
- The 35th Annual Conference of the Bangladesh Chemical Society, Bangladesh Chemical Congress (BCC 2012) was held on 7-9 December 2012. The theme of the conference was "Chemistry for Sustainable Development" and a good number of local and foreign participants attended the conference.

## TÜBİTAK MAM-TURKEY IMPROVING THE QUALITY OF TURKISH GREEN TEA

In recent years, green tea has attracted significant attention of consumers because of its reported health benefits. Although the potential of its production is very high in Turkey, the Turkish green tea is not well known in the country and abroad. Through the project "Improving the Quality of Turkish Green Tea and Developing New Green Tea Products", it is aimed to improve quality of Turkish green tea and develop new alternative green tea products. It is also aimed to widely promote Turkish green tea in and outside Turkey, to gain economical importance, increase competitiveness of Çaykur (Turkish national tea company), and encourage consumption of Turkish green tea.

Under this project, the analytical methods were used to assess the bioactive compounds in Turkish green tea, and validation studies were performed. Bioactive compounds of Turkish green tea were analysed over two consecutive years (2009 and 2010) for 3 harvesting seasons in each year. Turkish green tea contained 11.12% Epigallocatechin Gallate (EGCG) and 2.16% caffeine in dry extract. Brewing conditions of green tea, time and temperature relation was determined to increase the utilisation of tea extracts by consumers. Brewing condition at 85°C for 3 minutes was found as the best condition to extract maximum amount of bioactive compounds in water. This condition was also determined as the best point for consumers having maximum sensory scores. Enzyme inactivation and rolling are the critical green tea processing steps having an important role in determining the final product quality. For this reason, the effects of the enzyme inactivation and the rolling processes on the chemical, physical and sensory quality of the product were investigated in the final product, and accordingly the standard processing conditions were determined.

*Tablet green tea, green tea powder and green tea drink processed at TÜBİTAK MAM Food Institute*

Appropriate packaging parameters were determined to maintain the quality of green tea. Changes in chemical, sensory, physical and microbiological parameters of green tea were monitored at different temperature and time conditions to determine the shelf-life of green tea. The maximum shelf-life was determined for flexible packaging material having very low oxygen and water permeability in 24 months at 4°C, 12 months at 20°C and 10 months at 30°C.

Tablet green tea, cold green tea drink and green tea powder were developed as alternative new green tea products and their shelf-life studies were performed. Instant green tea was developed firstly, different aromas were added and it was pressed into a tablet form. Green tea drink was developed with different aromas. Green tea powder was tried as an ingredient in different food formulations such as ice-cream, cake and biscuits. Potential consumer's acceptance of all developed products was assessed and found as 'very satisfactory'.

## EVENTS HELD AT NMC-NIGERIA

The 6th meeting of Nigerian International Mathematics and Science Olympiad Committee (NIMSOCOM) was held at the National Mathematical Centre (NMC) on 10 December 2012. The meeting was attended by the Commissioners for Education or their representatives from all the States of Nigeria. At the opening ceremony, the Chairman of NIMSOCOM gave a welcome address, after which the meeting deliberated on several issues, such as the 2013 Olympiads exams, PAMO, PACOM, participation and sponsorship to International Olympiads.

The Director and Chief Executive of the National Mathematical Centre (NMC), Prof. A. R. T. Solarin, gave a series of talks in a 2-day workshop held at the centre on the 5th and 6th December 2012.

## EMBRAPA AGROBIOLOGIA-BRAZIL ENABLES AGRICULTURAL TECHNICIANS IN MOUNTAIN REGION

On 27-29 November 2012, Embrapa Agrobiologia, Brazil, held a training for agricultural technicians who work with family farmers in the mountainous regions to give them a broader understanding of the farming. The aim of the training was also to acquaint these professionals with the concept of territory, which includes, knowledge of history, culture and social life of these families, to help them better understand their needs. The resource persons imparting the training highlighted that the strategy of promoting the capacities of a region is effectively facilitated when the participation of all stakeholders is made more effective.

# THE SOLAR RESEARCHERS AIMING TO LIGHT UP AFRICA

**Ms. Christine Ottery**
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It was a surprise to Daniel Egbe to discover, at a 2010 conference in Tunisia, that two of his colleagues, both solar researchers from Africa, were not acquainted. So the Cameroonian scientist introduced Teketel Yohannes, a professor at Addis Ababa University, Ethiopia, to Samir Romdhane, a professor at the University of Bizerte, Tunisia. The result was the creation of the African Network for Solar Energy (ANSOLE), which is striving to harness local know-how to electrify the continent.

"I said 'let's see if us Africans can sit down and work together'," Egbe, currently a professor of organic chemistry at Johannes Kepler University in Linz, Austria, tells SciDev.Net. "We realised that we are working in related fields of semi-conductors and solar energy, and that's how ANSOLE materialised."

It is a compelling dream — to harness the abundant sunshine in an energy-deprived continent to fuel a better future for everyone. But African solar power researchers face many challenges. Loss of talent to the brain drain, lack of money to follow up ideas, little connection between like-minded colleagues across the continent, and few opportunities to entice scientists to turn their attentions to solar energy — all these plague the field.

**A network born**

ANSOLE launched officially a year ago, in Austria, at an event attended by African solar energy researchers from countries including Algeria, Cameroon, Côte d'Ivoire, Ethiopia, Morocco, Nigeria, South Africa and Tunisia. Its mission includes strengthening the links not just within Africa but between African countries and the rest of the world, so researchers from Europe, Turkey and the United States were also present. The network now has around 200 members — most of them scientists — from 22 African, and ten non-African, nations.

"We want the coming generation not to worry about where to study, who to work with," says Getachew Adam, a PhD student at the University of Addis Ababa, in Ethiopia, and ANSOLE member. "We want to make African scientists come together [to solve the] African energy problem."

Sub-Saharan African countries need money and coordinated research if they are to harness the power of the sun, says Egbe.

Mammo Muchie, founding editor of the African Journal of the Science, Technology, Innovation and Development, agrees, telling SciDev.Net that solar power will become the major renewable energy source on the continent only by organised research, training, design and engineering.

"Our approach is to build capacity, especially when it comes to research," says Egbe, who is now the co-ordinator of ANSOLE. "Through our network many African researchers, especially physicists and chemists, are now directing their research in solar and renewable energy."

The group also wants to train more people to university level and promote use of decentralised solar energy through educational programmes in local languages.

**Aiming high**

Connecting researchers is key, especially in a field where the continent's scientists have little interaction with those in richer countries, a continent which is expensive and time-consuming to traverse.

ANSOLE provides a platform for a mix of online and real-world networking. Each February 'ANSOLE Days' will bring African researchers and international collaborators face to face, says Egbe.

African scientists will also be able to start new collaborations through the ANSOLE website, which will hold a database of solar researchers and link people up to create joint proposals for scarce funding. But can African scientists ever catch up to the extent that they lead the way in solar research?

Cédric Philibert, an expert in renewable energy at the International Energy Agency, says Africa "is not yet a significant player in the field of 'hard' solar science", which includes areas such as photovoltaic technologies, concentrated solar power and solar fuels research [such as artificial photosynthesis].

"To expect Africans to compete internationally in the already very advanced area of silicon-based photovoltaics is not realistic," says Egbe. "But members of ANSOLE are saying that we can do internationally competitive research in organic and hybrid organic–silicon photovoltaics."

Traditionally, crystalline silicone has been used as the light-absorbing semi-conductor in solar cells, but organic photovoltaics use carbon-based molecules to conduct light and create an electrical charge.

Yohannes, the Ethiopian co-founder and now a regional representative for ANSOLE in East Africa, says: "Organic solar cell research has attracted researchers' attention in the last three decades, because of its ease of processing, low cost and the flexibility of organic polymer-based solar cells".

The relative low cost of organic solar technology and modest infrastructure requirements make it especially attractive to African researchers.

"With a little bit of money you can build your research labs and carry out your research. On this level we can compete with Europeans and Americans," Egbe says. "When it comes to silicon-based research, you need a lot of money and a clean room, which costs a lot."

However, organic semiconductors are still inefficient — the ratio between sunlight input and energy output is low — and they degrade when exposed to air or water. African researchers, such as Yohannes and PhD student Adam, who studies organic photovoltatics, are working on ways to solve these challenges. Meanwhile, another field where African researchers can push science forward is solar thermal energy, according to Egbe. This uses mirrored troughs, dishes or towers to harness sunlight for heat or electricity. Bertrand Tchanche, a Cameroonian researcher of thermal fluids at the Agricultural University of Athens, Greece, agrees that there is potential for African scientists to make headway with solar thermal research. But, he says, "The lack of research facilities and funding are major obstacles".

**The long game**

Already, ANSOLE has had some success building networks. Adam, for example, has been receiving valuable advice from professors in South Africa since ANSOLE began — it has allowed him to work in one country but get specialised advice from another.

As part of its online networking efforts, ANSOLE organised a webinar through nanotechnology project ICPC Nanonet in September. During his presentation, Abdelfattah Barhdadi, a professor at the University of Rabat in Morocco, revealed that he had the funding — but not the candidates — for five solar energy PhD places in his department, and was looking for Sub-Saharan African students.

"ANSOLE can help the movement of students from one country to the other, from poor countries to rich countries — in this way information will start to circulate between institutions," says Egbe.

One of ANSOLE's medium-term aims is to form an exchange programme for students to work in different institutions across Africa, improving the spread of knowledge. But ANSOLE's long-term vision is to create a new African research centre for renewable energy, as well as starting a graduate programme in renewable energy. There could even be one centre in each of main regions of the continent, Egbe says.

ANSOLE does not lack ambition, but what it can achieve may be limited by a lack of funding. To keep it running while filing for charity status, Egbe has already had to reach into his own pockets — although he will not disclose how much he has spent so far. He spends half of his time volunteering on ANSOLE, which is supported by his university.

"Our plans need funding," says Egbe. "I hope that the UN can support such endeavours, since the UN has declared 2012 the year of renewable energies, and renewable energies are important for the protection of our environment."

For upcoming events, including the meeting in Cameroon, ANSOLE needs around US$90,000. So far they have pledges from a variety of organisations but the total is still far from the needed budget. ANSOLE hopes to solve the funding challenges by attracting international investment from solar energy companies.

Philibert says this collaborative public–private approach could transform solar research in Africa especially in northern and southern Africa where both public and private actors are willing to develop a solar power industry.

Egbe seems optimistic: "We believe this will, in the long run, contribute to development of Africa."

***Courtesy:*** *SciDev.Net (2nd February 2012);* Reprinted with the permission of the author, who is a science and environment journalist. Available at: www.scidev.net/en/climate-change-and-energy/renewable-energy/features/the-solar-researchers-aiming-to-light-up-africa.html

# SCIENCE, TECHNOLOGY AND DEVELOPMENT

## INJECTABLE MALARIA INFECTION COULD SPEED VACCINE TESTING

According to *SciDev.Net* (20 November 2012), researchers have reported that injecting human volunteers with malaria parasites instead of exposing them to live mosquitoes could speed up clinical trials of new treatments for the disease. In usual trials people are exposed to infected mosquitoes, but it can be difficult to ensure that all receive the same dose of the infection.

Now, researchers at the Radboud University Nijmegen Medical Centre, Netherlands, have infected healthy volunteers with an injectable formulation of malaria parasites, potentially opening up a faster way to develop a malaria vaccine. The formulation is an enabling technology and is well suited for densely populated developing countries with high rates of malaria infections. For the first time this will allow investigators in any clinical facility in the world to test malaria drugs, hence changing the face of testing of these new products. Currently, five centres are looking at how best to administer the formulation.

Researchers took 18 healthy volunteers, split them into three groups and gave them differing doses of Plasmodium falciparum parasites (sporozoites) that had been frozen. Fifteen volunteers, five from each of the three groups, became infected with the disease. As soon as parasites were detected in blood smears the volunteers were given anti-malaria drugs for three days and were confirmed malaria free. The researchers consider the injectable formulation is a major achievement and state that using live mosquitoes is complicated as researchers have to ensure they are at the right stage of infection.

The sporozoites were harvested from the salivary glands of mosquitoes. The glands were dissected and the sporozoites were purified, bottled and then frozen in liquid nitrogen. With this formulation it is possible to go to the freezer and get the required test tube. It makes the process much easier and quicker.

## WEATHER MODEL GIVES FOUR-MONTH DENGUE OUTBREAK WARNING

Dengue fever, which is endemic in more than 100 countries, affects up to 100 million people a year and is more wide-spread in the developing countries. Patients usually recover within two weeks, after suffering from fever, rashes, muscle aches and other symptoms. The infection also kills between 12,500 and 25,000 people each year.

A new forecasting tool could give scientists a four-month head start in accurately predicting dengue fever outbreaks, says a study reported by *SciDev.Net* (December 21, 2012). The new model is based on data gathered in Singapore over an 11-year period. In 2011, scientists used the model to accurately predict all five of Singapore's dengue outbreaks four months in advance, thus giving the authorities sufficient time to prepare. The 'weather-based' model is designed to enhance existing tools used by the Singaporean government, apart from the regular practices promoted by the Public health campaigns. According to Hii, The model could also be adapted for use in other countries if unique local variables were incorporated.

Researchers who are skeptical of the study are of the view that the model may not be especially applicable to other countries in the region, and that the 16-week forecast "seems a bit too long" to be accurate. The lack of accurate climatological and meteorological data in the least developed countries could be another limitation in making it impossible to make future dengue predictions based on past data. The complexity of the problem increases with the virus mutations whose impacts depend on a range of human and environmental factors.

Amidst this hope and despair, wider regional cooperation could help effectively limit dengue infections. The study also says that a regional 'early warning' tool, pegged to weather anomalies like the El Niño/Southern Oscillation (a periodic warming cycle in the tropical Pacific Ocean), could help to complement national forecasting across the region.

## AFRICAN HIGH-SPEED DATA NETWORK ENCOURAGES GLOBAL RESEARCH COLLABORATION

In order to encourage global research collaboration, a high-speed network, developed under the AfricaConnect programme, has been launched that allows fast data transmission both among researchers in southern and eastern Africa and with scientists in Europe and other parts of the world (*SciDev.Net,* 4 December 2012). European funding for AfricaConnect is due to last till 2015, after which the project is intended to be solely funded by its African partners.

The UbuntuNet network, recently unveiled in Dar es Salaam, Tanzania, builds on links initially established between Europe and five African countries by the UbuntuNet Alliance, the regional research and education network for eastern and southern Africa. African scientists in fields such as agriculture, management of natural resources, climate change and earth observation, will benefit from access to a world-class data transmission network. In all of these fields, UbuntuNet will open up opportunities for African researchers to get engaged in cutting-edge research at a global level. One research area that was already benefiting from high-speed access was genomics, where the high-speed links are being used to exchange data between researchers in Malawi and Kenya and the Wellcome Trust's Sanger Institute in Cambridge, United Kingdom.

# PROFILE OF HEAD OF COMSATS' S&T CENTRE OF EXCELLENCE

## PROF. DR. ZHAOHUI LIN, DIRECTOR ICCES – CHINA

Prof. Dr. Zhaohui Lin is an eminent Chinese researcher in the field of environment sciences. Deputed by the Institute of Atmospheric Physics (IAP), Prof. Lin has been the head of International Center for Climate and Environment Sciences (ICCES), Beijing-China, since 2002

Prof. Lin has special research interest and expertise in the areas of: seasonal prediction of climate and environmental disasters; development of earth system model; land-hydrology-atmosphere interaction and its role on the climate variability and predictability; dust weather mechanism and prediction; and, dust aerosol-climate interaction. He has successfully implemented numerous research projects sponsored by the Ministry of Science and Technology (MoST), Government of China; Chinese Academy of Sciences; National Natural Science Foundation of China; and other scientific institutions working in the field of climate and environment sciences. At present, he is working on four major projects: (i) CAS Strategic Priority Research Programme: "Uncertainties for the Climate Simulation and Projection, using CAS Climate System Model" (PI, 2011-2015); (ii) International Collaboration Programme, sponsored by MoST: titled "Characteristics and Mechanism of the Extreme Climate Events Under the Climate Change Background" (PI, 2012.5-2014.4); (iii) NSFC Research Programme: Seasonal Hydrological Predictability Using the Dynamical Climate System Model (PI,2012.1-2015.12); and (iv) NSFC-Yunnan Province Joint Key Research Programme: "Investigation on the Mechanism for the Extreme Drought Events over Yunnan Province" (Co-PI, 2012.1-2015.12).

Since his scientific career in climate science from 1995, Prof. Lin has made many academic achievements. For the seasonal climate prediction, he developed the second generation of dynamical climate prediction system of the Institute of Atmospheric Physics (IAP DCP-II), in 1998. This prediction system has been applied in real-time forecast for summer-rainfall anomalies and spring dust-weather frequency over China, and has been adopted outside China as operational seasonal forecasting system, i.e. in Thailand. Prof. Lin developed a new approach for winter-rainfall prediction based on the East Asian winter monsoon index, and established a new multi-model ensemble prediction method based on Ensemble Kalman filter using different versions of IAP Climate System Models. Furthermore, he revealed the important impact of the land-surface conditions on the potential predictability of summer climate anomaly, and put forward an anomaly-coupling scheme for soil moisture initialization, which is consistent with the forecast system. This significantly increased the ability to make short-term climate prediction.

Prof. Lin has been involved in the climate model development since 1990. He improved the IAP two-level Atmospheric General Circulation Model by introducing new surface albedo parameterization scheme, and further analyzed the climate feedback mechanism for IAP and BMRC climate models in his Ph.D dissertation. Thereafter, he has led a group working on the model development having focus on atmospheric and land-hydrology component of earth system model. His research group established a new roughness length ($z_0$) parameterization scheme based on city building morphology in order to investigate the impact of urbanization on local and regional weather and climate. The group has also developed a large-scale hydrological model system for water-resource simulation and climate-change impact assessment, and proposed a coupling methodology between groundwater and soil-water; furthermore, developed a coupled land surface and hydrologic model system.

Prof. Lin developed an IAP atmosphere-land-vegetation coupled model, based on OASIS coupler, and evaluated the intensity of land-atmosphere coupling over the global and Asia region by the IAP atmosphere-land coupling model. He firstly proposed the conceptual picture of atmospheric and terrestrial water cycle over Huaihe River Basin, and revealed the inter-decadal variability features of the different hydrological component over the basin. He has also paid much attention to the dust related issues in China and developed an improved numerical dust weather modeling and prediction system in 2005. His research group has coupled several different dust emission schemes with Weather Research and Forecasting (WRF) and Community Earth System Model (CESM), and further revealed the impact of dust emission schemes on the simulation of dust budget and their uncertainties.

The outstanding research achievements of Prof. Lin had won him recognition and awards, such as the Second Grade of State Natural Science Award (2005); First Grade of the Award for the Progress of Science and Technology by the Chinese Ministry of Education (2006); and Governmental Special Allowance offered by the State Council (2008). In 2011, he was awarded the outstanding Science and Technology Achievement Prize of the Chinese Academy of Sciences for his significant achievement on the "Formation and Development Mechanism of Dust Storm and its Monitoring, Forecast and Disaster Assessments". As the Director ICCES, Prof. Lin attaches great value to international cooperation and scientific exchange. He holds membership of COMSATS' Coordinating Council (since 2009), and APEC Climate Center Working Group on Seasonal Prediction (since 2003); contributes as Associate Editor-in-Chief of Climatic and Environmental Research (since 2012), and Associate Editor of Aeolian Research (since 2009), etc. Under his guidance, ICCES has been an active part of international cooperation with renowned international research institutions and universities. Moreover, ICCES also hosts the Secretariat of CAS-TWAS-WMO Forum (CTWF), which is an international forum on climate and environment sciences that meets regularly. As a research scholar, Prof. Lin has published over 80 research papers and co-authored two books. In his capacity as professor, he supervised 25 graduate students at Master and Ph.D levels.

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# COMSATS' BRIEF AND ANNOUNCEMENTS

## SELECTED FORTHCOMING SCIENTIFIC EVENTS IN COMSATS' COUNTRIES

| | |
|---|---|
| 11 -15 March 2013 | International Scientific Spring - 2013, Islamabad, Pakistan *(www.ncp.edu.pk)* |
| 26-28 April 2013 | 8th International Conference on Computer Science & Education (ICCSE - 2013), Colombo, Sri Lanka *(www.ieee-iccse.org)* |
| 1-3 May 2013 | 2nd meeting of COMSATS Consultative Committee in conjunction with the 16th meeting of COMSATS Coordinating Council, Accra, Ghana *(www.comsats.org)* |
| 18 - 21 June 2013 | International Conference on Environmental Science and Technology (ICOEST 2013), Nevsehir, Turkey *(www.icoest.org)* |
| 24 June - 6 July 2013 | 38th International Nathiagali Summer College (INSC - 2013), Nathiagali, Pakistan *(www.ncp.edu.pk)* |

## RETIREMENT OF MR. PARVEZ AHMED BUTT

COMSATS Secretariat pays tribute to its outgoing Advisor, Mr. Parvez Ahmed Butt, for his long-standing affiliation with COMSATS in different capacities. Mr. Butt has the honour of being the founder Executive Director of COMSATS (1994-1998). Subsequently, he remained affiliated with COMSATS in capacities of Projects Director COMSATS Internet Services (CIS) and Director General CIS. With Masters Degrees in Physics (Pakistan) and Economics (U.S), Mr. Butt has held important positions in the government departments and institutions of Pakistan, most notable amongst these have been: the Secretary, Ministry of Science and Technology and Ministry of Environment and Urban Affairs; and Managing Director, Pakistan Tourism Development Corporation. Mr. Parvez Ahmed Butt has retired from his position as the Advisor (CIS) at COMSATS Secretariat, w.e.f. 1st January 2013

## CALL FOR PAPERS FOR COMSATS' JOURNAL – SCIENCE VISION: VOL. 18

Science Vision is a biannual scientific journal of COMSATS. It primarily aims at highlighting the important scientific and technological developments that have a bearing on socio-economic conditions of the people. It invites research as well as review articles that have general scientific descriptions, with comprehensive elucidation of the impact of S&T discoveries and innovations for creating understanding of the contemporary issues and challenges.

COMSATS invites scholarly contributions for the Volume 18 (January to December 2012) of its journal. Scientists, researchers, policy-makers and young scholars from S&T organizations and R&D institutions are encouraged to contribute articles on any scientific field of interest relevant to the focus of the journal. As per the policy of the journal, contributors are compensated for their time and efforts with a modest amount of honorarium.

For more details, please visit COMSATS' official website: www.comsats.org or the journal's website: www.sciencevision.org.pk. Contributions may be sent to the Chief Editor at: comsats@comsats.org.

## A BRIEF ON COMSATS

The Commission on Science and Technology for Sustainable Development in the South (COMSATS) is an inter-governmental organization, with its Secretariat located in Islamabad, Pakistan.

COMSATS, currently, has 21 countries as its members, spread across three continents, i.e. Africa, Asia and Latin America. A network, of 18 International Science and Technology Centres of Excellence, is also affiliated with COMSATS to contribute to scientific development of its Member States. For detailed information, please visit COMSATS' website: www.comsats.org.

## COMSATS NETWORK OF INTERNATIONAL S&T CENTRES OF EXCELLENCE

- Bangladesh Council of Scientific and Industrial Research (BCSIR), Bangladesh
- Centro Internacional de Física (CIF), Colombia
- COMSATS Institute of Information Technology (CIIT), Pakistan
- Council for Scientific and Industrial Research (CSIR), Ghana
- Embrapa Agrobiologia, Brazil
- Higher Institute for Applied Sciences and Technology (HIAST), Syria
- Industrial Research and Consultancy Centre (IRCC), Sudan
- International Center for Chemical and Biological Sciences (ICCBS), Pakistan
- International Center for Climate & Environment Sciences (ICCES), China
- International Centre for Environmental and Nuclear Sciences (ICENS), Jamaica
- Iranian Research Organization for Science and Technology (IROST), Iran
- National Mathematical Centre (NMC), Nigeria
- National Research Centre (NRC), Egypt
- Royal Scientific Society (RSS), Jordan
- Tanzania Industrial Research and Development Organization (TIRDO), Tanzania
- TÜBİTAK Marmara Research Center (MAM), Turkey
- The Biosphere Reserve – Beni Biology Station (BBS), Bolivia [Under Review]
- University Cheikh Anta Diop (UCAD), Senegal