



# S&T Newsletter



A Quarterly of the  
Centre for Science and Technology of the Non-Aligned  
and Other Developing Countries (NAM S&T Centre)

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## From the Director'S Desk

Warmest greetings to all our esteemed readers!!

NAM S&T Centre has established itself as an apex institution for the promotion of South-South, and also North-South cooperation through scientific and technological interventions. High technical contents of its activities have constantly attracted the developing countries and those with emerging economies to associate themselves with the Centre to freely avail the facilities offered and get access to its vast network.

In the above context I am highly gratified to welcome Jordan as the 45<sup>th</sup> member of the NAM S&T Centre. The proposal got materialised as a result of my discussions with the concerned Jordanian authorities and the intervention of Prof. Dr. Wajih M. Owais, Honourable Minister of Higher Education and Scientific Research during my visit to Amman for participation in the 2<sup>nd</sup> International Conference on Materials in Jordan (ICMJ) held on 9-11 April 2011.

The Centre organised a highly successful International Hands-On Training on 'Energy Audit For Energy Professionals in Developing Countries' in Mumbai, India During 4-14 May jointly with the Centre for Energy Studies and Policy Analysis (CESPA) and the Society of Energy Engineers and Managers (SEEM), India. The training course was attended by 38 trainee participants from 17 countries and 24 resource persons and trainers from India. The deliberations led to the adoption of a set of recommendations titled 'Mumbai Resolution-2011 on Energy Management in Developing Countries'.

Applications are now being invited for the Joint NAM S&T Centre - ZMT Bremen (Germany) Fellowship in Tropical Coastal Marine Ecology and Biogeochemistry for 2011. Applications are already flowing in for the Joint NAM S&T Centre - ICCBS Karachi (Pakistan) Fellowship for 2011-12.

An International Conference on 'Harnessing the Potentials of New and Advanced Materials for Developing Economies' will be organised by the Centre at Abuja, Nigeria during 9-12 August 2011. In addition, a variety of scientific activities are lined up in the coming period, for which the announcements will be made in due course, and I earnestly invite the concerned scientists and professionals to take part in the knowledge sharing.

Happy Reading!

  
(Arun P. Kulshreshtha)

## Centre Welcomes

JORDAN: 45<sup>TH</sup> MEMBER COUNTRY OF NAM S&T CENTRE



NAM S&T Centre welcomes the Hashemite Kingdom of Jordan as its new member country with effect from May 2011. H.E. Prof. Dr. Wajih M. Owais, Honourable Minister of Higher Education and Scientific Research of Jordan has designated Prof. Nasri Rabadi, Director General, Scientific Research Support Fund (SRSF) as the Focal Point of the Centre in Jordan.

Jordan is located on the East Bank of the River Jordan. Amman, capital of Jordan, is also the political, cultural, commercial, and industrial centre of the nation. With its relatively limited natural resources, the country heavily



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## Centre Organised

International Hands on Training on  
ENERGY AUDIT FOR ENERGY PROFESSIONALS IN DEVELOPING COUNTRIES  
Mumbai, India, 04-14 May 2011

Energy efficiency and conservation are important elements of energy planning and policy as these are aimed at the reduction in energy consumption and energy demand per capita and offsetting the increase in energy supply needed to keep up with the population growth. This strategy reduces the rise in energy costs and also



Inauguration of Energy Audit Hands-On Training

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the need for energy imports. The reduced energy demand can provide more flexibility in choosing the most preferred methods of energy production. Energy conservation facilitates the replacement of non-renewable resources with renewable energy. It is often the most economical solution to energy shortages, and is a more environmentally benign alternative to increasing the energy production. Energy efficiency represents a cost-effective approach to raising profitability, enhancing competitiveness and improving environmental performance. The possibilities range from relatively simple and low-cost process modifications to sophisticated and more costly investments in pollution prevention technologies.

To deliberate on the above issues the Centre for Science and Technology of the Non-aligned and Other Developing Countries (NAM S&T Centre) in association with the Centre for Energy Studies and Policy Analysis (CESPA), Trivandrum, India and the Society of Energy Engineers and Managers (SEEM), India organised a 11-days 'International Hands-On Training on Energy Audit For Energy Professionals in Developing Countries' during 4-14 May 2011 at Jawaharlal Nehru Port Trust (JNPT), Navi Mumbai, India. Eminent knowledge partners and supporting organisations such as the International Copper Promotion Council of India (ICPCI), Indian Society of Lighting Engineers (ISLE); Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE); Petroleum Conservation Research Association (PCRA), India; Maharashtra Energy Development Agency (MEDA); Synergy Consultants Pvt. Ltd.; See-Tech Solutions Pvt. Ltd.; and Kirlosker group played a key role in the overall execution of this training programme.

The Hands-On Training programme was opened in Indian traditional way by lightning of oil lamps. In the Inaugural Session Mr. Umesh Kapre, Secretary, SEEM Maharashtra Chapter welcomed the delegates. Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre presented the genesis of the event and also briefly described the

activities of the NAM S&T Centre. This was followed by the Presidential Address by Mr. Dalip Singh, President, SEEM - India. After the address by the Guest of Honour, Prof. Dr. Mahmoud Mohamed Abdellatif Sakr, Vice President, Academy of Scientific Research & Technology (ASRT), Egypt, Mr. L. Radhakrishnan, IAS, Chairman, Jawaharlal Nehru Port Trust (JNPT), India gave the Inaugural Address.

In the latter part of the Inaugural Session the representatives of some partner and supporting organisations, namely, Dr. Prakash Barjatia, Chairman, ISLE; Mr. P. K. Sinha, Joint Director & Regional Coordinator, PCRA; and Mr. Maharana, General Manager (Operations), JNPT informed the participants about their significant contributions made in the direction of energy efficiency. The session was concluded with the Vote of Thanks by Mr. Shishir Athale, Chairman, SEEM Maharashtra Chapter, Mumbai.

The Hands-On Training was attended by 38 trainee participants from 17 countries, namely, Botswana, Brunei, Cambodia, Egypt, India, Indonesia, Iraq, Malawi, Malaysia, Mauritius, Myanmar, Nepal, Nigeria, Sri Lanka, Tanzania, Togo and Uganda. There were 24 resource persons and trainers from India.

22 overseas trainee participants were from Botswana [Mr. James Jakoba Molenga, Acting Principal Engineer (Renewable Energy), Botswana

Technology Centre (BOTEC), Gaborone]; Brunei [Mr. Muhammad Robin Yong bin Abdullah, Engineer Supervisor, Authority for Building Control and Construction Industry, Ministry of Development, Dr. Rohaniyati Binti POKLWDSP Haji Md Salleh, Executive Engineer, Mechanical and Electrical Department, and Ms. Justina Liew Vun Ching, Executive Engineer, Head of Safety Unit in Public Works Department (PWD), Ministry of Development]; Cambodia [Mr. Khlaing Amradararith, Deputy Head Office, Energy Efficiency and Conservation in Building and Factory, Energy Management and Research, Department of Energy Technique (MIME), Phnom Penh]; Egypt [Prof. Dr. Mahmoud Mohamed Abdellatif Sakr, Vice President, Academy of Scientific Research & Technology (ASRT), Cairo]; Indonesia [Dr. Ophirtus Sumule, Deputy Director, Ministry of Science and Technology, Jakarta Pusat]; Iraq [Mr. Haider Hammoodi Abdulhadi, Ministry of Science and Technology, Directorate of Researches and Renewable Energy; and Mr. Rashid Khalaf Mahmood, Head / Senior Chemist, Department of Studies, Planning and Pursuance, Ministry of Oil]; Malawi [Mr. Lameck Kabambalika Nkhonjera, Lecturer, Dept. of Physics and Biomedical Sciences, The Polytechnic, University of Malawi, Blantyre]; Malaysia [Ms. Rosnida binti Mohd. Yusof, Principal Assistant Director, Environment and Energy Branch, Public Works Department Headquarters of Malaysia, Kuala Lumpur, and Dr. Tan Ching Sin, Head of Energy Security, Institute of Energy Policy and Research (IEPRE), Universiti Tenaga Nasional (UNITEN), Kajang]; Mauritius [Mr. Ashley Purmanund, Senior Electrical Engineer, Ministry of Energy and Public Utilities (MEPU), Port Louis]; Myanmar [Dr. (Mrs.) Thida Swe, Deputy Director, Myanmar Science and



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Technology Research Department, Yangon]; Nepal [Dr. Suresh Kumar Dhungel, Senior Technical Officer, Nepal Academy of Science and Technology (NAST), Kathmandu]; Nigeria [Mr. Ismail Ibraheem Idris, Senior Scientific Officer, Raw Materials Research and Development Council (RMRDC), Abuja, and Mr. Badmos Soliu Adebare, Scientific Officer, National Biotechnology Development Agency (NABDA), Federal Ministry of Science and Technology, Abuja]; Sri Lanka [Mr. Kodithuwakkuge Jayasinghe, Principal Research Engineer, National Engineering Research & Development Centre (NERD), Ekala, Ja Ela]; Tanzania [Mr. Styden N. Rwebangila, Energy Engineer Renewable Energy Section, Ministry of Energy and Minerals, Dar es Salaam]; Togo [Mr. Abdoulaye Robil Nassoma, Engineer in Energy, Direction Generale De L'energie, Lome]; and Uganda [Mr. Geofrey Bakkabulindi, Head, Energy Efficiency Program, Centre for Research in Energy and Energy Conservation (CREEC), Makerere University, Kampala, and Mr. Davis Bariho Bagamuhunda, Energy Systems Engineer, Uganda Industrial Research Institute, Kampala].

The Indian trainee participants were Mr. V. S. Babaram, Deputy Manager (Electrical Maintenance), Mr. A. G. Wadtkar, Assistant Manager (Electrical Maintenance), Mr. T. N. Chavan, Assistant Manager (Electrical Maintenance), Mr. S. S. Gurav, Assistant Manager (Crane Maintenance), Mr. B. D. Sinkar, Assistant Manager (Crane Maintenance) and Mr. Mukund Digambar Dongre, Superintendent (AC Maintenance) from JNPT, Navi Mumbai; Mr. Sunil Patel, Mr. Prashant Joshi and Mr. Vishal Bhapkar from Kirloskar Brothers Ltd., Pune; Mr. Geetesh Goyal, Business Partner, Goyal Krishi Kendra, Pachore; Mr. Jaydeep Neminath Lengade, Proprietor, Aditya Consultants, Karnataka; Mrs. Deepa S. Kumar, Energy Technologist, Energy Management Centre, Kerala; Mr. Jignesh Patel, Assistant Manager (Power Quality and Energy Conservation), Amtech Electronics (I) Ltd.; Mr. Ashish Bhgwat, Technical Executive, Senergy Consultants / EEMPL, Mumbai; Mr. Sharad Kale, G. M. Technical, Mumbai; and Mr. Gaurav Gaur, Research Assistants from the NAM S&T Centre.

During the Hands-On Training, lectures were delivered by eminent Indian experts and professional Dr. Prakash Barjatia, Chairman, Mumbai State Centre, ISLE [on 'Lighting Energy Efficiency'], Mr. M. C. Jain, Chairman, SEEM Chhattisgarh Chapter [on 'Energy Efficiency in Industries'], Mr. Ravindra Datar, Senergy Consultant (P) Ltd. [on 'Energy Audit Report'], Mr. S. B. Mahajani, Deputy General Manager, Amtech Electronics (India) Ltd. [on 'Harmonics: Cause, Effects and

Mitigation Techniques'], Mr. Dalip Singh, President, SEEM [on 'Energy Efficiency through Power Quality']; Mr. Virender Kumar Gupta, ICPCI [on 'Energy Management through High Efficiency Motors (HEMs)']; Mr. Venugopala Rao, PCRA [on 'Steam Generation and Distribution']; Shirish M. Deshpande, Director, Energetic Consulting Pvt. Ltd. [on 'Energy Efficiency in Buildings' and 'Energy Efficiency in Pumping Systems']; Mr. Sharad Kale, PGDER WTC-MERC, Mumbai [on 'E.C. Act 2001']; Mr. Mohtasib Najeeb Mahammed, Senior Executive, Siemens Ltd. [on 'Selection of Engineering Equipments with Energy Efficiency Focus Motors & Drives']; Mr. Mohtasib Najeeb Mahammed, Senior Executive, Siemens Ltd. [on 'Selection of Engineering Equipments with Energy Efficiency Focus Motors & Drives']; Mr. Pradeep Sharma and Mr. Sanjay Moghe from Kirloskar Bros. [on 'Kirloskar Solar Pumping System', 'Automation in KBL Pumps & Systems' and 'Life Cycle Costs In Pumps and Pumping Systems']; Mr. P. C. Lohia, Sr. VP Engineering, Reliance Industries and ISHRAE Mumbai Chapter [on 'Case Studies in Energy Audit Proves the Point']; Mr. Kunal Godse, See-Tech Solutions Pvt. Ltd. [on 'Save Electricity Bill with See Tech']; Mr. R.L. Birla, PEER Services, Mumbai [on 'Enriching Energy Audits']; Mr. Rajesh Deshpande, Director, Energetic Consulting Pvt. Ltd. [on 'From Audit Reports to Implementation']; and Dr. R. Harikumar, Energy Management Centre, Kerala and Vice President, SEEM [on 'Energy Management Assessing the Organisation's Preparedness', 'Energy Audit', 'Energy Efficiency Scenario in India' and 'Energy Monitoring, Targeting & Reporting']. The overseas participants presented their country / institutional status reports and research papers in the Country Presentation sessions.

While the Technical Presentation sessions were respectively chaired by Mr. Dalip Singh and Prof. Dr. Mahmoud Mohamed Abdellatif Sakr; Dr. Prakash Barjatia and Dr. Tan Ching Sin; Mr. Venugopala Rao and Mr. Geofrey Bakkabulindi; and Mr. Dalip Singh and Mr. Venugopala Rao, the Country Presentation sessions were chaired by Mr. Venugopala Rao and Mr. Davis Bariho Bagamuhunda; Mr. Muhammad Robin Yong bin Abdullah and Dr. Rohaniyati Binti POKLWDSP Haji Md Salleh; Mr. G. Krishnakumar and Mr. Styden N. Rwebangila; Ms. Justina Liew Yun Ching and Ms. Rosnida Binti Mohd. Yusof; Mr. Badmos Soliu Adebare and Dr. Suresh Kumar Dhungel; and Mr. James Jakoba Molenga and Mr. Ashley Purmanund.

In addition to the technical presentations and country reports, demonstration of various measuring equipments such as flow meter, power quality analyser, thermal imager etc was made by



Group Photo of Energy Audit Hands-On Training, Mumbai



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Mr. Pradip Thakur, Sioux Power Solutions. See Tech provided a software tool to the participants ,which calculates or analyses various parameters once we input the measured data .An innovative talk was delivered by Mr. R. Birla and Mr. C. Jayaraman of SEEM- India addressed the participants. A special lecture on 'South-South Cooperation in Science and Technology The Role of NAM S&T Centre' was delivered by Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre.

Participants were also taken to the private terminal inside the JNPT port, namely, Gateway Terminals Indian Pvt. Ltd. where Mr. Suhas Karandikar, Engineering Head through his presentation on 'GTI Engineering and Cost Saving Initiatives' and an interactive talk informed the participants about the innovative practices being used by GTI to minimise the energy consumption and saving on its expenses.

Mr. Venugopala Rao was the chief mentor of the event who delivered a round of lectures and provided day to day clarification to the participants' queries on various issues during the discussion rounds. All the participants (Indian and foreign) of the Hands-On Training were divided into four groups and for each group, mentors and JNPT coordinators were identified to help the participants in sampling and data collection from various sites at JNPT port and residential areas, and in analysing the data taken from the these sites. While Mr. Kale, Mr. Atul and Mr. Ashish from Senergy Consultants Pvt. Ltd.; Mr. Prashant Joshi, Mr. Sunil Patil, Mr. Vishal Bankar from Kirloskar Bros.; Mr. A. Auddy and Mr. Vishnu from I.S.L.E.; Mr. Ajit Datar (SEEM), Mr. Gignesh Patel (Amtech) and Mr. Ariz Ahamed from SEE-Tech, Nagpur; and M/s Pramod D. Khatal, Shailesh Tambade and Mr. Bapat from M/s ECPL, Mumbai played the role

of the mentor, Mr. Dongare, Mr. T. N. Chauhan, Mr. V. S. Baburam and Mr. Walkter were the coordinators from JNPT.

Since Jawaharlal Nehru Port Trust (JNPT) complex was taken as a case study for energy audit exercise, Mrs. Deepa S. Kumar, Energy Technologist, Energy Management Centre, Kerala presented a draft 'Quick Recommendations' to suggest the avenues where energy conservation and saving could be possible in JNPT.

In the Concluding session, a special Participants' Interactive Forum was also organised, which was moderated by Prof. Arun P. Kulshreshtha, in which the discussion was highly interactive in nature and the participants made specific suggestions and comments. Subsequently, a set of recommendations titled 'Mumbai Resolution on Energy Management in Developing Countries' was adopted after considerable deliberations and debate.

As a token gesture on improving the environment, planting of trees by the participants was organised almost each day in the Smruti Van, the forest area in the JNPT grounds. The participants were also taken via sea route to a world heritage monument, 'Elephanta Caves', and then to the Gateway of India and Hotel Tajmahal in Mumbai. The Chairman of JNPT, Mr. L. Radhakrishnan, IAS, hosted a banquet dinner on the penultimate evening of the hands-On Training.

The participants thanked the organizers of the Hands-On Training for the successful and fruitful organisation of the event and for excellent hospitality and the arrangements made for the delegates, and unanimously hoped that more similar events will be held in future.

## DISTINGUISHED VISITORS TO THE CENTRE

<b>1<sup>st</sup> April 2011</b>	<b>Mr. Baldev Mamtani</b> , Sustainable Electrical Energy & Construction project, International Copper Promotion Council (India), Mumbai, India
<b>9<sup>th</sup> May. 2011</b>	<b>H.E. Dr. Sead Avdi</b> , Ambassador, Embassy of Bosnia and Herzegovina, New Delhi, India
<b>18<sup>th</sup> May. 2011</b>	<b>Dr. M. Hassan Shafazand</b> , Head of Technology Cooperation Section and <b>Dr. Ali M. Birang</b> , Science Attaché, Embassy of Iran
<b>17<sup>th</sup> June 2011</b>	<b>Prof. Romain Murenzi</b> , Executive Director, The Academy of Sciences for the Developing World (TWAS), Trieste, Italy and Formerly, the S&T Minister of Rwanda
<b>22<sup>nd</sup> June 2011</b>	<b>Mrs. Rajka ?eri</b> , Counsellor, Embassy of Bosnia and Herzegovina, New Delhi, India
<b>28<sup>th</sup> June 2011</b>	<b>Mr. Shahabuddin Saqib</b> , Counsellor, Embassy of Afghanistan, New Delhi, India

## PARTICIPATION OF CENTRE'S SCIENTISTS IN WORKSHOPS/SEMINARS/CONFERENCES

<b>12-13 May 2011</b>	<b>Ms. Manjari Manisha</b> , Research Assistant attended an International Conference on 'Equity and Access to Medicine: Role of Innovation and Institutions' organised by the Research and Information System for Developing Countries (RIS) and the Indian Council of Medical Research (ICMR) at Taj Mahal Hotel, New Delhi.
<b>08 June 2011</b>	<b>Dr. V. P. Kharbanda</b> , Publication Advisor attended a Talk on 'Innovation and Entrepreneurship' at American Centre, New Delhi.
<b>09 June 2011</b>	<b>Dr. V. P. Kharbanda</b> , Publication Advisor attended a Lecture Series on 'The Change Agents Innovative Indian Organisations' organised by EMPI Institutions, the Indian Express at India International Centre, New Delhi.



## *MUMBAI RESOLUTION-2011*

### **On Energy Management in Developing Countries**

**WE, THE DELEGATES** to the 11-day '**International Hands-On Training on Energy Audit for Energy Professionals in Developing Countries**' jointly organised by the Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) and the Centre for Energy Studies and Policy Analysis (CESPA), a Centre of Excellence promoted by the Society of Energy Engineers & Managers (SEEM), hosted by Jawaharlal Nehru Port Trust (JNPT), Navi Mumbai, India during 4<sup>th</sup> - 14<sup>th</sup> May 2011;

**COMPRISING** the scientists, academicians, technocrats, engineers, consultants, industrialists, government policy makers, certified energy managers and auditors from Botswana, Brunei, Cambodia, Egypt, India, Indonesia, Iraq, Malawi, Malaysia, Mauritius, Myanmar, Nepal, Nigeria, Sri Lanka, Tanzania, Togo and Uganda, as well as Indian agencies namely SEEM, Petroleum Conservation Research Association (PCRA), Maharashtra Energy Development Agency (MEDA), Energy Management Centre (EMC) Kerala, Indian Society of Lighting Engineers (ISLE) Mumbai State Centre, and International Copper Promotion Council of India (ICPCI);

**STRONGLY CONCLUDE THAT** developing countries should take initiatives on energy optimisation and conservation to protect themselves from future energy crises and secure a more sustainable development path;

**UNANIMOUSLY RESOLVE** that:

Energy efficiency and prudent energy use should be promoted in all sectors of the economy by meticulously implementing energy management practices and systems with strong focus on performance and continual improvement.

The policy makers should provide incentives to improve energy efficiency considering the environmental impacts of inefficient and indiscriminate energy use and the need to heavily spend on the energy supply infrastructure to keep pace with developmental needs.

The policy makers should encourage preliminary energy audit in all enterprises in order to acquire accurate micro-level data on energy usage pattern in all sectors.

Energy efficiency standards should be developed for equipment in common use. The same should be enforced through consultations with the stakeholders.

Energy efficiency service providers including consultants, energy service companies, energy auditors and energy managers should be accredited and their database with capacity statements made easily accessible to the consumers.

Policy makers are expected to collaborate with private and non-governmental organisations and service providers for systematic planning and innovative policy formulation.

Bodies of energy professionals should be established in the developing countries to provide networking and knowledge sharing opportunities.

This Resolution is a clarion call to policy makers and the public at large to wake up to the potent threat of energy shortage and to forearm by promoting energy efficiency related activities as part of their social responsibility.

CESPA representatives proposed to establish a joint Fellowship scheme on Energy Audit with the NAM S&T Centre, subject to necessary approvals and availability of funds.

We place on record our gratitude to Jawaharlal Nehru Port Trust (JNPT) for their wholehearted support to this unique endeavour.

**Done this Day, the 14<sup>th</sup> of May 2011 at Mumbai, India**



## SCIENCE AND TECHNOLOGY NEWS IN THE DEVELOPING WORLD

### Algeria: New ICT Projects

A number of IT projects have been announced in Algeria aimed at democratising the use of the internet across the country. One of these, the '1 PC per family' initiative will initially target teachers and their pupils and will involve the provision of computers, broadband internet and training paid through specific financing mechanisms. It will then be extended to healthcare facilities, with those located in the more populous north of the country sharing best practice with those in the south. A convention is being drafted in collaboration with the Health Ministry including a pilot telemedicine project to connect via a hospital in each of the 10 southern districts (wilayas) via dedicated broadband link with a counterpart in the north. Its aim is to enable southern doctors to make diagnoses in consultation with those in the coastal cities. The government has also launched an ICT training project aiming to support 1 million residents of all ages and social status, in partnership with the professional training ministry. Several training centres will be established and financed through an existing ICT development fund. A 'Cyber Rif' project has also been announced by the Ministry to introduce the possibilities offered by the internet to people living in rural and mountainous parts of the country.

*Source: e.gov, 25<sup>th</sup> May 2011*

### Brazil: First Transgenic Sugarcane

Brazil, the top producer of ethanol derived from sugarcane has developed its first transgenic sugarcane that contains the gene for drought tolerance. The research in Brasilia at the Empresa Brasileira de Pesquisa Agropecuaria (EMBRAPA) on the introduction of drought tolerant gene DREB2A into sugarcane was started in 2008. Through biolistic transformation method, transgenic sugarcane plants were developed and evaluated and selected in a greenhouse. The transgenic plants will be evaluated for their tolerance to drought by May 2012. Selection of the best performance both in the agronomic and desired characteristics will follow the evaluation process set by the National Technical Committee (CTNBio). This is the first transgenic sugarcane developed which will open possibilities for the introduction of other traits into sugarcane beneficial to farmers, consumers and the industry.

*Source: Crop Biotech Update, 27<sup>th</sup> May 2011*

### Cape Verde (Santiago Island): Largest Photovoltaic Plant in Africa

The largest photovoltaic installation in the African continent with an extension of 13 hectares and a peak power of 5 MW is located in Praia, Santiago Island, Cape Verde. It is shortly followed in extension and capacity by its sister-plant in Sal Island, with 2.5 MW and 9.5 hectares. Both installations have been designed and built by Martifer Solar, subsidiary of Martifer SGPS, in only seven months, implementing the PV modules that the company produces in its own factory in Portugal. These installations implied an additional challenge due to the characteristics of the environment, very close to the sea and extremely salty; The Martifer Solar's modules withstand the effects of salt mist (Standard IEC 61701:2005 for Salt Mist Corrosion), protecting all their clean energy production potential. The Santiago Island PV plant is installed on fixed structures and has an estimated production of 8,120 MWh/year. The Sal Island PV plant is also installed on fixed structures and has an estimated production of 3,960 MWh/year. Together, these projects ensure the production of nearly 4% of the total energy produced in the Cape Verde archipelago and will avoid the emission of 13 thousand tons of CO<sub>2</sub> per year. The electricity generated goes straight to the grid and is directly operated by the national power company.

*Source: Energetica International, 28<sup>th</sup> March 2011*

### Chile: Antarctic Microbes living Life to the Extreme

Chilean Antarctic survey finds dramatic variety of organisms

adapted to unusual conditions. One may not expect bacteria living in Antarctic ice to be well suited to life in a boiling kettle, but that is what Chilean scientists discovered during an expedition last year, when more than 200 new species of microorganisms adapted to living in extreme environments have turned up. They discovered many psychrophiles, organisms that thrive in conditions cooler than 15°C, as well as halophiles, which survive in high concentrations of salt, and acidophiles and alkaliphiles, which can tolerate extremes of pH. But the researchers also found a surprising number of thermophiles and hyperthermophiles, which prefer temperatures above 50°C, including one microbe that could survive at 95°C despite spending its life encased in the ice. Such an organism, they say, must have evolved when the Antarctic environment was very different to how it is today. Another strange discovery is a previously unknown Deinococcus, a group of bacteria known as the worlds toughest, capable of tolerating  $\gamma$ -ray exposures 5,000 times greater than those survived by any other known organism despite living 15 metres beneath the permafrost. These levels of radiation have never existed on Earth, so the source of the bacterium's resistance is a mystery. Theories put forth so far include that the microbe had an extraterrestrial origin. Blamey says that at this point, no theory has been discarded. The researchers have also identified psychrophiles resistant to ultraviolet radiation, which use enzymes to capture reactive oxygen species. These organisms might have practical biotechnology applications and could eventually find a use in technologies designed to protect people against solar and UV radiation. A potentially useful organism isolated in shallow marine sediment samples had the ability to grow in highly salty environments and at temperatures as low as 4°C. Some of the molecules that accumulate in the microbes are known biostabilizers and they could have applications in the cosmetics and pharmaceutical industries. The extreme temperatures and exposure to ultraviolet radiation in Antarctica allow the area to 'function as a natural laboratory that promotes the selection of organisms resistant to such pressures'.

*Source: Nature News, 4<sup>th</sup> April 2011*

### Colombia: From Drugs to Food in Farming Expansion

Colombia plans to nearly double its agricultural land growing crops for food and biofuel as part of a new investment boom in the country as violence ebbs from a decades-long internal conflict fuelled by drug profits. The idea is to transform the vast eastern plains, dotted for years with illicit coca plantations, into the country's bread basket in a push to bring down food prices and boost revenues from agricultural exports. But first Colombia will have to overcome serious infrastructure problems and concerns about land rights after millions of people have been displaced by violence. Global food prices soared to a record in February and while they have fallen since then, many experts say they will stay high as populations grow faster than farmers can feed them. Latin America could help buck that trend as the region in the world with the most land still available and suitable for agriculture after Africa. Colombia has 53 million acres (21.5 million hectares) that could be planted with crops such as corn, soy, African palm and sugar but just 12 million (5 million) are currently being used, says the agriculture ministry. Already the world's top grower of high-quality washed arabica coffee and No. 5 in palm oil, Colombia is mostly self sufficient in food production but imports more than 3 million tons of corn each year for animal feed. The government wants to grow enough corn to cover up to half of domestic demand. Large swaths of the Andean nation were off limits for years as drug runners, leftist guerrillas and right-wing paramilitary groups battled over territory. But a U.S.-backed crackdown has helped cut coca planting, which fell 13 percent last year compared to 2009 to 145,000 acres. Colombia is still the world's No. 1 coca grower. Violence remains a problem, including bloodshed over land rights, but security has opened up the



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possibility of farming in once avoided areas.

Source: ENN Environmental New Newsletter, 24<sup>th</sup> May 2011

### Costa Rica: Beetle "Bling" reveals Optical Secrets

Deep in Costa Rica's tropical rain forests live two lustrous beetle species that are giving optics researchers new insights into the way biology can recreate the appearance of metals by means of reflected light. Scientists at the University of Costa Rica have found that the gold of the *Chrysina aurigans* beetle and the silver of the *Chrysina limbata* beetle are created by the unique structural arrangements of many dozens of layers of exoskeletal chitin in the elytron, a hardened forewing that protects the delicate hindwings that are folded underneath. The beetles were captured in the university's Alberto Brenes Mesén Biological Reserve, a tropical rain forest environment. The metallic appearance of these beetles may allow them to be unnoticed, something that helps them against potential predators. The surface of their elytra "reflects light in a way that they look as bright spots seen from any direction. In a tropical rain forest, there are many drops of water suspended from the leaves of trees at ground level, along with wet leaves, and these drops and wet leaves redirect light by refraction and reflection respectively, in different directions. Thus, metallic beetles manage to blend with the environment. To interpret the cause of this metallic look, the scientist assumed that a sequence of layers of chitin appears through the cuticle, with successive layers having slightly different refractive indices. In these beetles, the cuticle, which is just 10-millionths of a meter deep, has some 70 separate layers of chitin, a nitrogen-containing complex sugar that creates the hard outer skeletons of insects, crabs, shrimps and lobsters. The chitin layers become progressively thinner with depth, forming a so-called "chirped" structure. Because the layers have different refractive indices, light propagates through them at different speeds. The light is refracted through, and reflected by, each interface, giving in particular phase differences in the emerging reflected rays. For several wavelengths in the visible range, there are many reflected rays whose phase differences allow for constructive interference. This leads to the metallic appearance of the beetles. This is similar to the way in which a prism breaks white light into the colours of the rainbow by refraction, but in the case of these beetles, different wavelengths, or colours of light, are reflected back more strongly by different layers of chitin. This creates the initial palette of colours that enable the beetles to produce their distinctive hues. The mystery the researchers still needed to understand in more detail, however, was how the beetles could so perfectly create the structure causing the brilliant metallic tones of silver and gold. Using a device they specially designed to measure the reflection of light when it strikes the curved surface of the beetles' elytra, the scientists found that as light strikes the interface between each successive layer (the first interface being the boundary between the outside air and the top chitin layer), some of its energy is reflected, and some is transmitted down to the next interface. This happens through the complete sequence of interfaces. Because a portion of the light is reflected, it combines with light of the exact same wavelength as it passes back through layer upon layer of chitin, becoming brighter and more intense. Ocean waves can exhibit the same behaviour, combining to produce rare but powerful rogue waves. In the case of the beetles, this 'perfect storm' of light amplification produces not only the same colours but also the striking sheen and glimmer that we normally associate with fine jewellery. In the two beetle species, interference patterns are produced by slightly different wavelengths of light, thus producing either silver or gold colours. For the golden-like beetle, the constructive interference is found for wavelengths larger than 515 nm, the red part of the visible wavelength range, while for the silver-like beetle, it happens for wavelengths larger than 400 nm, that is, for the entire visible wavelength range. The detailed understanding of the mechanism used by the beetles to produce this metallic appearance opens the possibility to replicate the structure used to achieve it and thus produce materials that, for example, might look like gold or silver but are actually synthesized from organic

media. This potentially could lead to new products or consumer electronics that can perfectly mimic the appearance of precious metals. Other products could be developed for architectural applications that require coatings with a metallic appearance. In the solar industry, for example, chirped multilayer reflectors could be used as back layers supporting the active or light-absorbing medium, to improve the absorption of the back-reflected light.

Source: Photonics Weekly, 28<sup>th</sup> April 2011

### Egypt: Weevil Detector to protect Palm Trees

A machine that detects the red palm weevil, a pest that devastates palm trees across the Middle East and North Africa, could help farmers protect their crops. The tiny red insects burrow into the trunks of palm trees and devour them from within, so infestations known as 'date palm AIDS' are usually unnoticed until the weevils have hollowed out the trunks. The trees then collapse beneath their own weight or are blown over by the wind. The red palm weevil is the worst known palm tree pest in the world, affecting a quarter of Egypt's 12 million palm trees. A machine designed by Egypt's Defence Ministry programmed with the molecular signature of a weevil's DNA and identifying a match when it is pointed to an infected area of trunk by emitting electronic shock waves works like a metal detector. By detecting which part is infected, the machine helps to minimise the amount of pesticide applied. Farmers used to depend on the physiological symptoms that appear in the very late stages. Now, with the machine, the tree can be rescued before it's too late.

Source: AfricanBrains, 18<sup>th</sup> May 2011

### Ghana: Pension through Biometric Registration

In a major e-Governance initiative, as a measure to address the many concerns expressed on the integrity of the government's payroll on pensioners, a Biometric Registration of Ghana Pensioners (CAP 30) has been launched in Koforidua in the Eastern Region. The Biometric Registration is geared towards the collation of an accurate data on about 7,30,000 government CAP 30 pensioners and public sector employees on the Controller and Accountant General's Department (CAGD) pensioners' payroll. This is to help clean, update and eliminate all ghost names from the payroll of pensioners in the country. The exercise which started in the Eastern Region will be replicated in other regions at appropriate scheduled dates, and will help to improve the social-political and economic life of the citizenry to have a sound public financial management system. The CAGD has been asked to double-check the information on those reported dead by people without concrete proof and also help to adequately resource the Birth and Death Registry and SSNIT to their cooperation for this exercise

Source: E-Gov, 1<sup>st</sup> June 2011

### India: Injecting Innovation into Small Enterprises

A partnership between India's National Innovation Council (NinC) and the Council of Scientific and Industrial Research (CSIR) is expected to boost innovation among micro, small and medium enterprises (MSMEs) in India. The new partnership proposes to tap CSIR expertise to set up innovation centres in MSME clusters and identify technological problems they face and also find solutions. Each centre will consist of people capable of building links between industry and scientific and financial institutions. CSIR will lend the human resources to solve technological challenges faced by these clusters by designating specialised experts from among its 37 laboratories. The organisation also plans to post the technological challenges of the MSME clusters on its website so that scientists, other than those designated for a particular cluster, can offer solutions. CSIR, Foundation for MSME clusters, industry bodies like the Federation of Indian Chambers of Commerce and Industry, Confederation of Indian Industry and the ministry for MSMEs will be the partners in the venture. The partnership aims to create a model to infuse innovation among Indian MSMEs which have a very low track record of generating, applying or using new technology. In contrast, MSMEs the world over are known as hotbeds of innovation. According to the National Knowledge Commission, Indian MSMEs are also not as successful as large



(Contd. from Page 1 - Centre Welcomes )



Inaugural Group Photo of 2<sup>nd</sup> International Conference on Materials in Jordan (ICMJ), Amman, Jordan, 8-12 April 2011

relies on the human element for its economic and social progress. Due to the quality of the services provided in the country and its wealth of educated and talented people, Jordan is achieving internal success and is also able to export human expertise and skilled manpower to other countries in the region. In order to tap Jordan's human talent, the promotion of science and technology is at the top of both public and private sectors' priority lists. The Higher Council for Science and Technology, the Royal Scientific Society and the R&D programmes supported by various private companies are the key components of Jordan's S&T sectors. Since 1950's, Jordan has made intensive efforts to develop its indigenous S&T capabilities, using its young, highly skilled labour force. In 1977, the Council was abolished and in its place the Directorate for Science and Technology was set up with a view to linking scientific activities to development objectives.

Jordan's ability to undertake scientific research was enhanced with the creation of private and public scientific institutions, of which 193 are involved in science and technology. Of these institutions, 82 have laboratory facilities totalling 379 laboratory units. In 1988, the Higher Council for Science and Technology (HCST) was formed to unify and supervise the development of research and the administration of science and technology in Jordan, coordinate national policy, and create a national scientific and technological base that would assist and develop existing institutions

Jordan has significant deposits of both oil shale and sources of uranium; these potential sources of indigenous energy have been the focus of renewed interest in recent years.

Jordan is a founding member of the Arab League, WTO, AFESD, Arab Parliament, AIDMO, AMF, IMF, International Criminal Court, UNHRC, GAFTA, GCC, ESCWA, ENP, United Nations and Non Aligned Movement (NAM), and enjoys 'advanced' status with the European Union.

The Centre expects to forge further collaborative relations with Jordan on various scientific issues that are of relevance and interest to the developing countries. Being a member of the Centre, Jordan would henceforth be entitled to nominate its scientists, researchers and professionals to participate in the international scientific events and training course being organized by the Centre, avail various Fellowships offered by the Centre on competitive basis and also take part in multilateral collaborative projects without any financial implications.

## Director NAM S&T Centre Meets and Visits



With H.E. Prof. Wajih Owais, Minister of Higher Education & Scientific Research of Jordan (R) and Prof. Mustafa A. Al Adwan, Secretary General in the Ministry

Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre visited Jordan during 8-12 April 2011 to attend the 2<sup>nd</sup> International Conference on Materials in Jordan (ICMJ) in Amman, which was organised by Prof. Marwan S. Mousa, President, Jordanian Club of Humboldt Fellows and Jordanian Physics Society and Professor of Materials at Mu'tah University, Al-Karak jointly with the Alexander von Humboldt (AvH)



With H.E. Dr. Abdel-Salam Majali, President, World Affairs Council (C) and Dr. Moneef R. Zou'bi, Director General, Islamic-World Academy of Sciences (L)

Society, Jordan Atomic Energy Commission and several Jordanian universities. The Conference was attended by nearly 300 scientists and professionals from academic / R&D institutions and private sector



Dr. Gizela Janetzke, Dy Secy Gen, Alexander von Humboldt Foundation (R) and Ms. Nancy Karashai, Jordan Atomic Energy Commission

enterprises. The foreign participation was of the AvH Fellows of ~ 10 countries in the region as well as from Germany and the officials of the AvH Society. The Conference deliberations were focussed on topics like Minerals and Alloys, Oil Shale and Pharmaceuticals and Drug Design. Prof. Kulshreshtha made a presentation on 'Science & Technology Perspectives in Developing Countries'.

Prof. Kulshreshtha also used this opportunity to call on H.E. Prof. Dr. Wajih M. Owais, Honourable Minister of Higher Education and Scientific Research; H.E. Dr. Khaled Najieb Elshuraydeh, Secretary General, Higher Council for Science and Technology; H.E. Dr. Abdul Salam Al-Majali, President, World Affairs Council; and H.E. Dr.



With Dr. Eshak Darwish, Chief Scientist (C) and Ms. Abeer Arafat, Cooperative Development Officer External Affairs (R) Royal Scientific Society of Jordan



(Contd. from Page 8 - Director NAM S&T Centre Meets and Visits)



With H.E. Dr. Khaled Najieb Elshuraydeh, Secretary General, Higher Council for Science & Technology, Jordan (C) and Prof. Omar Al-Ayed, Al-Balqa' Applied University (L)



Delegates of Jordan Atomic Energy Commission



Dead Sea Group Photo of the participants of Jordan Meterilas Conference

Moneef R. Zou'bi, Director General, Islamic-World Academy of Sciences. He also had a brief discussion with H.E. Dr. Khaled Toukan, Minister of Energy & Mineral Resources and also visited the offices of the Royal Scientific Society to meet with the senior officials. The objective of these meetings was to explore the possibility of Jordan becoming a member of the NAM S&T Centre and the discussions were very positive.

Prof. Kulshreshtha and other delegates visited the Dead Sea and some sites of cultural interest.

## VISITORS TO THE CENTRE



With H.E. Dr. Sead Avdic Ambassador, Embassy of Bosnia and Herzegovina in India (3<sup>rd</sup> from R)



Dr. M. Hassan Shafazand, Head of Technical Cooperation Section (R) and Dr. Ali M. Birang, Counsellor (L), Embassy of Iran in New Delhi



Prof. Romain Murenzi, Executive Director, Academy of Sciences for the Developing World (TWAS) and Former S&T Minister of Rwanda



With Mr. Shahabuddin Saqib, Counsellor (P), Afghanistan Embassy in New Delhi



(Contd. from Page 7 - S&T News)

firms in pushing forward the innovation frontier. The MSMEs are looking forward to the establishment of the innovation centres to take better advantage of the existing knowledge base.

Source: *SciDev.Net*, 13<sup>th</sup> June 2011

#### **Iran: Nanoparticles for Precise Measurement of Salicylic Acid Drug**

Nano-adsorbents based on layered double hydroxides can be used in the purification of industrial and hospital wastewater due to their high adsorption capacity. Moreover, such compounds are biodegradable and they can be recycled very easily. Therefore, such adsorbents have a long life and they can be used in the removal of pollutants in several stages. Iranian researchers in Tarbiat Moallem University of East Azarbaijan province have used solid phase extraction (SPE) method to extract salicylic acid drug from biological media with a complex matrix such as blood serum, plant tissue and medicine samples. SPE is the most appropriate method to remove the complex matrix, and it is very cost-effective and simple. Selecting the solid phase is the most important factor in solid phase extraction. Due to their high ratio of area to volume and their high chemical and thermal stability, nanoparticles improve the efficiency of solid phase extraction method significantly. In the present study, layered double hydroxide (LDH) nanoparticles were used as the solid phase in the SPE method.

Source: *Nanotechnology Now*, 10<sup>th</sup> June 2011

#### **Kenya: World's First VCS REDD MEGA Project**

Wildlife Works announced that its pioneering Kasigau Corridor REDD Project, Phase II - The Community Ranches, was successfully validated and verified under the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity Standard (CCB) and is the world's first VCS REDD mega-project in that it will result in the avoidance of over 1 million tonnes of CO<sub>2</sub>-e emissions per year for the next 30 years. The REDD initiative now protects over 500,000 acres of Kenyan forest, securing the entire wildlife migration corridor between Tsavo East and Tsavo West National Parks, and bringing the benefits of direct carbon financing to more than 100,000 people in the surrounding communities. Wildlife Works implemented the REDD project in an area of highly threatened wilderness known as the Kasigau Corridor on behalf of more than 4,000 local landowners from 13 Community Group Ranches who are the owners of the Carbon Credits. REDD brings a positive change to the region with real and direct solutions for poverty alleviation as the carbon money earned through conservation activities that afford the ability to protect the environment helps community meet basic needs and improve the lifestyle. The Kasigau Corridor REDD project was awarded the additional distinction of Gold level status by the CCB for exceptional biodiversity and climate benefits. The project area is home to a fantastic diversity of over 50 species of large mammals, more than 20 species of bats and over 300 species of birds and important populations of IUCN Red List species such as Grevy's Zebra, Cheetah, Lion, African Wild Dog as well as over 2000 African elephants seasonally. With a projected revenue value of more than \$300M over the 30 year life of the project, the project's Validation, Verification and Carbon Credit Issuance demonstrates the value and viability of carbon investments as a scalable means of delivering commercial results while, at the same time, mitigating global warming, uplifting communities and protecting wildlife by reducing human-wildlife conflict. French bank, BNP Paribas provided early support for the project through a multi-million dollar deal to buy an option to purchase a portion of the annual carbon credits over the next five years. The 1.25M tonne option purchase agreement was announced in September 2010 alongside a separate agreement for the bank to provide Wildlife Works with up to \$50m in project financing intended to leverage the company's extensive rural African experience to expand its innovative forestry protection model to other areas in Africa, the tropics and the rest of the world where biodiversity and communities face threats from deforestation.

The objective of the project is to permanently protect the dryland Acacia-Commiphora forest that forms a wildlife dispersal and migration corridor between Tsavo East and Tsavo West National Parks, to conserve the important biodiversity found in those forests, to provide alternative sustainable development opportunities for the local communities that live adjacent to the forests and to prevent the emissions that would otherwise occur were those dryland forests to be converted to subsistence agriculture using the slash and burn methods typical to this area of Kenya. Job creation is the essence of Wildlife Works REDD strategy/ The projects create jobs for conservation rangers, factory workers, horticulturalists, machinists, seamstresses, foresters, carpenters, construction workers, drivers, mechanics and administrative personnel and they finance the development of small businesses such as a clothing factory, sustainable charcoal producers, distributors and soap manufacturing. Wildlife Works' is establishing the Wildlife Works Carbon Trust, to manage 5 different community committees spread geographically around the project area for transparent disbursement of REDD funds into community projects. Already, carbon finance has enabled community projects that include; reforestation of deforested water catchments, building schools, bursaries for kids to go to High School and College, and support for local women's and conservancy groups. The Project Design Documents containing all the details of Wildlife Works Project can be found on the VCS and CCB websites, [www.v-c-s.org](http://www.v-c-s.org) (project database) and [www.climate-standards.org/projects](http://www.climate-standards.org/projects) respectively.

Source: *Energetica-Africa*, 31<sup>st</sup> May 2011

#### **Saudi Arabia: Largest Women's University in World**

King Abdullah Bin Abdul-Aziz of Saudi Arabia opened the largest women's university campus in the world in a major move to boost women's higher education in the Kingdom. The US\$5.3-billion new campus of Princess Nora Bint Abdulrahman University (PNU) on the outskirts of the capital, Riyadh, spreading over eight million square meters and completed in a record time of less than three years will host up to 50,000 students in its 15 departments. It is also planned to be a car-free environment, operating a shuttle monorail train and electric buggies for internal transport, while solar panels stretched on the campus will reportedly generate 18 percent of the power needed for air-conditioning. The campus also boasts a 700-bed hospital and accommodation facilities that could lodge 12,000 students. The university will be environment-friendly by promoting a paperless work policy and carrying out all its internal activities electronically. The university's library has about six million titles including reference books. Women make up 58 percent of the total student population of 130,000 at seven universities in Saudi Arabia, according to the United Nations Educational, Scientific and Cultural Organization (UNESCO). The Saudi government devotes nearly 30 percent of its annual budget, or \$40 billion, to education.

Source: *Al Arabiya News*, 15<sup>th</sup> May 2011

#### **South Africa: Earth Observation Satellite**

Around end March 2011, one set of the reaction wheels of South Africa's first low-orbit earth observation (EO) satellite SumbandilaSat had stopped working. The reaction wheels stabilise the satellite and its onboard camera and since there was no redundancy plan, the satellite tumbled forward. Despite being called a 'crippled ship', SumbandilaSat, a technology demonstrator, is doing what it was designed to do. Orbiting at about 500 km from the Earth's surface, the satellite is transmitting earth observation imagery. Built by SunSpace, a microsatellite company, SumbandilaSat was launched in September 2009 from the Baikonur Cosmodome in Kazakhstan. It was an 'inexpensive' satellite and cost compromises were made because it wasn't built for longevity but as a prototype to show that South Africa had the capacity.

Source: *Geospatial World*, 25<sup>th</sup> March 2011



## Centre Announces

### Joint NAM S&T Centre ZMT Bremen (Germany) Fellowship in Ecology and Biogeochemistry of Tropical Coastal Marine Systems

The Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre: [www.namstct.org](http://www.namstct.org)) is pleased to invite applications for the Joint NAM S&T Centre - ZMT Bremen (Germany) Fellowship.

The Fellowship is awarded to young scientists and researchers from the developing countries for affiliation with the Leibniz Centre for Tropical Marine Ecology (ZMT), Bremen, Germany [[www.zmt-bremen.de](http://www.zmt-bremen.de)] for a period of up to 3 months to work with its senior researchers and faculty members for upgrading research skills in the fields related to Ecology and Biogeochemistry of Tropical Coastal Marine Systems and undertaking short-term joint research projects. Depending on the research topic, the Fellows can also benefit from the ZMT's association with Marine Science Institute of Bremen University, Max Plank Institute for Marine Microbiology and the MARUM Research Centre in Bremen.

Under this scheme, the NAM S&T Centre sponsors up to five scientists in a given calendar year (one scientist only from any given developing country), and covers the international airfare of the Fellows from its member countries. Applications from the developing countries, which are still not the member of the NAM S&T Centre, are also welcome subject to certain conditions. ZMT provides a subsistence monthly allowance of 1000 Euros for accommodation and other expenses in Bremen. Selection is strictly on competitive basis based on the applicant's academic and professional background, the plan of work and the mutual research interests of the applicant and ZMT.

Application recommended by the parent institutions of the applicants may be submitted to the NAM S&T Centre by email in the relevant format. There is no last date for submitting the application but the selection will be made on first-cum-first basis strictly based on the professional details of the applicant, plan of work to be carried out and mutual research interests of the applicant and ZMT. Copies of the guidelines for the Fellowship and the application form are attached (also available at the Centre's Website [www.namstct.org](http://www.namstct.org)). The Guidelines may please be read carefully before making the application.

## ADMINISTRATIVE STAFF OF NAM S&T CENTRE

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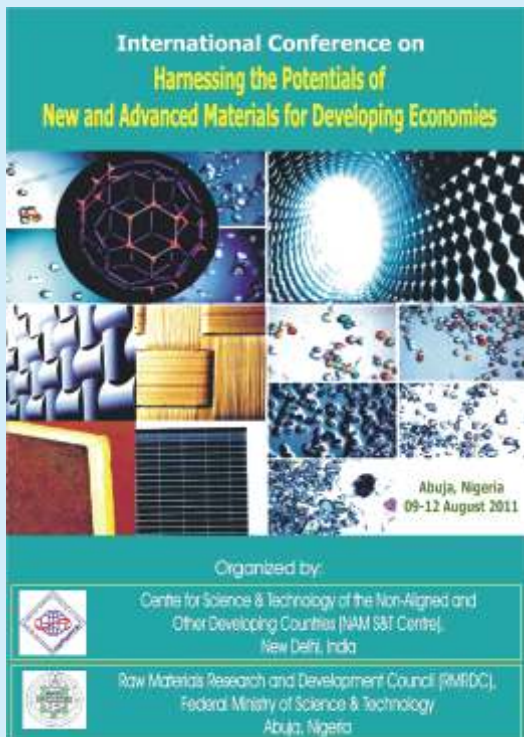
Hansha Ram Arya  
Librarian and Documentation Manager





## Centre Announces

# International Conference on HARNESSING THE POTENTIALS OF NEW AND ADVANCED MATERIALS FOR DEVELOPING ECONOMIES Abuja, Nigeria 09-12 August 2011



The world of science in recent times is fast changing its emphasis to increasingly use the advanced materials and associated technologies for industrial growth by gradually replacing the traditional raw materials as inputs for manufacturing. The advanced materials are technologically developed from conventional materials, but in the process of such development, they acquire specific features with ability to perform the functions that conventional materials cannot. These characteristics include greater strength, higher strength /density ratio, greater hardness, corrosion resistance, fracture toughness, superior thermal, electrical, chemical and optical properties, etc. The novel and advanced materials have proven to have greater economic advantages, especially when these are developed from renewable resources such as natural fibre and plant materials.

The new technology has traversed almost all the sectors of the economy including aerospace, transportation, information technology, environmental protection, medicine and health as well as civil infrastructure. Hence any nation that does not develop its inherent capabilities and potentials in new and advanced materials stands the risk of technological marginalisation. Moreover, the decreasing amount of raw

materials needed to manufacture a unit of industrial production globally is leading to a sharp fall in the demand for the conventional raw materials, resulting in a direct negative economic impact on developing exporter nations.

The developing countries need to explore the avenues for adding value to their mineral resources and also join the elite club of nations exploiting advanced materials technology for rapid industrialisation. This therefore calls for a vigorous pursuit of a coordinated programme in the production and utilisation of new and advanced materials and the attendant technological advancements for national development.

To deliberate on above issues, the Centre for Science & Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) jointly with the Raw Materials Research and Development Council (RMRDC) of the Federal Ministry of Science & Technology Abuja, Nigeria announces a 4-day International Conference on Harnessing the Potentials of New and Advanced materials for Developing Economies to be held at Abuja, Nigeria during 9-12 August 2011. The Conference is aimed to stimulate awareness on the development and trends on new and advanced materials and their impact on the economy, explore opportunities and develop strategies for participation of scientists in the development and utilisation of new technologies in advanced materials, draw attention of the scientific community especially researchers to the possible contributions they could make in the area of New and Advanced Materials Development and examine opportunities available in developing countries for new and advanced materials and how best to facilitate collaboration and networking for exploiting them.

For further details, please visit the website of the NAM S&T Centre <http://www.namstct.org>.

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