

**INTERNATIONAL WORKSHOP
ON
NANOTECHNOLOGY IN THE EDGE OF CONVERGENCE
MALAYSIA, 24-27 NOVEMBER 2011**

Venue: Puri Pujangga, Universiti Kebangsaan Malaysia (UKM), Bangi, Selangor

PARTICIPATING COUNTRIES: **19 Developing Countries (Including 15 Member Countries, 4 Non-Member Country of the NAM S&T Centre)**

NUMBER OF PARTICIPANTS: **The Workshop was attended by 25 overseas participants from the host country and 24 scientific papers were presented in six Technical Sessions.**

Nanotechnology, the study of manipulating matter on atomic and molecular scales, involves developing materials or devices possessing at least one dimension sized from 1 to 100 nanometers. This field of science has gathered enormous significance in recent years and tremendous advancements have been made with a variety of applications in almost all spheres of life. Nanotechnology has the potential to create many new materials and devices and possibly holds solutions to world's problems related to water, agriculture, nutrition, health and energy.

With a view to providing a forum for the academicians, scientists and researchers active in the fields of nano-science and nano-technology to deliberate upon the aforementioned issues and to create awareness of this field's significance, the Centre for Science & Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre), New Delhi, India in collaboration with the Commission on Science and Technology for Sustainable Development in the South (COMSATS), Islamabad, Pakistan and the Institute of Microengineering and Nanoelectronics (IMEN), Universiti Kebangsaan Malaysia (UKM), Malaysia organised a 4-days International Workshop titled 'Nanotechnology in the Edge of Convergence' at Puri Pujangga, Universiti Kebangsaan Malaysia (UKM), Bangi, Selangor, Malaysia during 24-27 November 2011. The United Nations Educational, Scientific and Cultural Organization (UNESCO) was among the major sponsors of this scientific event.

The Inaugural Ceremony was opened with the Welcoming Remarks by Prof. Dato' Dr. Burhanuddin Yeop Majlis, Director, Institute of Microengineering and Nanoelectronics (IMEN), UKM. Prof. Arun P. Kulshreshtha, Director & Executive Head, NAM S&T Centre presented the genesis of the event and also briefly described the activities of the Centre. This was followed by a message of Dr. Imtinan Elahi Qureshi, Executive Director, COMSATS read by Prof. Arshad Saleem Bhatti, Dean, Faculty of Science, COMSATS Institute of Information Technology (CIIT), Islamabad, Pakistan. After brief remarks of Mr. Mohd. Zulkifli Hashim, Executive Secretary, Malaysian National

Commission of UNESCO, the opening speech was given by Prof. Datuk Dr. Noor Azlan Ghazali,, Deputy Vice Chancellor, UKM. The Opening Session concluded with a Keynote Address on ‘Nano Malaysia Programme and Way Forward’ by Prof. Dr. Halimaton Hamdan, Undersecretary, National Nanotechnology Directorate, Ministry of Science, Technology and Innovation, Malaysia.

19 countries, namely Bangladesh, Bulgaria, Cambodia, Egypt, India, Indonesia, Iraq, Kenya, Malawi, Mauritius, Morocco, Myanmar, Nepal, Pakistan, Sudan, Tunisia, Uganda, Vietnam and the host country Malaysia participated in this Workshop. The overseas participants were from Bangladesh [Mr. M. L. Palash, Lecturer, Dept. of Applied Physics, Electronics and Communication Engineering, University of Dhaka], Bulgaria [Prof. Kostadin Grozev Kostadinov, Associate Professor on Robotics and Automation, SM IEEE, Sofia and Scientific Secretary of Bulgarian Academy of Sciences], Cambodia [Mr. Seng Silong, Lecturer, Electrical and Power Engineering, Institute of Technology of Cambodia (ITC), Phnom Penh], Egypt [Dr. Hany Hussein Abdel Ghafar, Researcher, Water Pollution Research Department, Environmental Research Division, National Research Center (NRC), Dokki], India [Dr. Madhulika Bhati, Scientist, National Institute of Science, Technology and Development Studies, (CSIR-NISTADS), New Delhi; **and** Ms. Bidisha Pal, Research Assistant, NAM S&T Centre], Indonesia [Dr. Silvester Tursiloadi, Senior Researcher of Applied Chemistry, Research Centre for Chemistry, Indonesian Institute of Sciences (LIPI), Tangerang], Iraq [Dr. Sabeeha Abdul Jabbar Beden, Scientific Researcher, Directorate of Materials, Ceramic Centre, Ministry of Science and Technology, Baghdad], Kenya [Dr. Erastus Gatebe, Senior Lecturer, Department of Chemistry, Jomo Kenyatta University of Agriculture and Technology, Nairobi], Malawi [Dr. Timothy Tiwonge Biswick, Senior Lecturer, Chancellor College, University of Malawi, Zomba], Mauritius [Mr. Hemraj Ramsurrun, Resource Officer, Rajiv Gandhi Science Centre Trust Fund], Morocco [Prof. Ismail Mekkaoui Alaoui, Physics Department, Faculty of Sciences, Cadi Ayyad University, Marrakech], Myanmar [Dr. Aung Kyaw Myo, Assistant Director, Nanotechnology Research Department, Metallurgical Research and Development Center, Nay Pyi Taw], Nepal [Dr. Deba Bahadur Khadka, Vice President, Nepal Chemical Society, Tribhuvan University, Kirtipur], Pakistan [Prof. Arshad Saleem Bhatti, Dean, Faculty of Science, Department of Physics; Mr. Jibran Ahmed Abbasi, Research Associate, Department of Physics; Mr. Muhammad Fahad Bhopal, Research Associate, Department of Physics; and Mr. Muhammad Rizwan Khan, Researcher, Department of Physics of the COMSATS Institute of Information Technology (CIIT), Islamabad; and Dr. Shamsa Kanwal, Assistant Professor, HEJ Research Institute of Chemistry, Karachi University, Karachi], Sudan [Mr. Nazar Shawgi Abdellateef Ahmed, Director, Materials and Electronics Research Institute (MERI), National Centre for Research, Ministry of Science and Technology, Khartoum], Tunisia [Ms. Ben Yahya Sonia, Researcher, High Institute of Technological Studies, ISET, Gabes; and Ms. Nouri Hanen, Researcher, Research Laboratory: Chemical Reactor and Process Control, National School of Engineering, Gabès University], Uganda [Ms. Philippa Ngaju, Instrumentation Engineer, Uganda Industrial Research Institute, Kampala] and Vietnam [Mr. Nguyen Ngoc Think, Principal Investigator, Department of Inorganic and General Chemistry, Hanoi University of Science and Technology, Hanoi]. From the NAM S&T Centre, Prof. Arun P. Kulshreshtha, Director & Executive Head had attended the event.

The overall programme of the Workshop was conducted in six technical sessions, respectively co-chaired by (1) Prof. Halimatun Hamdan (Malaysia) and Prof. Mekkaoui Alaoui Ismail (Morocco); (2) Dr. Hany Hussein Abdel Ghafar (Egypt) and Prof. Kostadin Grozev Kostadinov (Bulgaria); (3) Prof. Ille Christine Gebeshuber (Department of Physics, Nanotechnology and Biomimetics, IMEN, UKM) and Mr. Nazar Shawgi Abdellateef Ahmed (Sudan); (4) Prof. Mohamad Deraman (School of Applied Physics, Faculty of Science and Technology, IMEN, UKM) and Dr. Silvester Tursiloadi (Indonesia); (5) Assoc. Prof. Mohd. Yusri Abd. Rahman (Dept. of Sciences, Mathematics and Computing, College of Foundation and General Studies, Universiti Tenaga Nasional, Kajang, Malaysia) and Dr. Deba Bahadur Khadka (Nepal); and (6) Prof. Pankaj Kumar Choudhury (IMEN, UKM) and Dr. Madhulika Bhati (India).

24 scientific papers presented during the Workshop by the foreign participants were on 'Nanotechnology and Governance: Bangladesh Perspective' by Mr. M. L. Palash of Bangladesh; 'Hydro-Mint Robot Technology in Hybrid Assembly for Precise Manufacturing of Microproducts' by Prof. Kostadin Grozev Kostadinov of Bulgaria; 'The Starting of Nanotechnology in Cambodia' by Mr. Seng Silong of Cambodia; 'Preparation and Characterization of Nano-Sized Hybrid Photocatalyst of WO_x and TiO_2 ' by Dr. Hany Hussein Abdel Ghafar of Egypt; 'Emerging Risk Issue, Debates and Silences about Nanotechnology: A Case Study of India' by Dr. Madhulika Bhati of India; 'Therapeutically Engineered Nanoparticles and Their Targeted Delivery' by Ms. Bidisha Pal of India; 'Nano - Catalyst Sulfated TiO_2 , ZrO_2 and TiO_2 - ZrO_2 Prepared by Supercritical Extraction and Modified Gel.' by Dr. Silvester Tursiloadi of Indonesia; 'Nano-Colloidal Silver Impregnated Ceramic Candle Filter for Drinking Water' by Dr. Sabeeha Abdul Jabbar Beden of Iraq; 'Controlled Release of Fertilizer using Mesoporous Silica Nanoparticles' by Dr. Erastus Gatebe of Kenya; 'Controlled Release and Antioxidant Activities of Zinc Basic Salt (ZBS) - Phenolic Acid Nanohybrids' by Dr. Timothy Tiwonge Biswick of Malawi; 'Nanotechnology for Mauritius –Awareness on Potential Applications and the Need for Capacity Building' by Mr. Hemraj Ramsurrun of Mauritius; 'Nanocrystalline CdSe Quantum Dots and Applications for Finger Mark Visualization' by Prof. Mekkaoui Alaoui Ismail of Morocco; 'Process Study on Titanium Dioxide Nanotubes, TNT from $TiCl_4$ and Fabrications of Dye Sensitized Solar Cell by using TiO_2 Nanopowder and TiO_2 Nanotubes' by Dr. Aung Kyaw Myo of Myanmar; 'Measurement of Deexcitation Cross Sections of $Ne(^3P_1)$ by N_2 using a Pulse Radiolysis Method' by Dr. Deba Bahadur Khadka of Nepal; 'Facile One-Pot Synthesis of Gold Nanoparticles and their Sensing Protocol' by Dr. Shamsa Kanwal of Pakistan; 'Bonding Energy Dependence of Solubility of Catalysts in the VLS Synthesized ZnS Nanostructures' by Dr. Arshad Saleem Bhatti of Pakistan; 'Optimized SACM-Avalanche Photodiode Structure' by Mr. Muhammad Rizwan Khan of Pakistan ; 'Temperature Tuned Simulation of InAlAs-InGaAs-InAlAs DHBT' by Mr. Muhammad Fahad Bhopal of Pakistan; 'Effect of Absorption Region Thickness on the Performance of Planner InP/InGaAs/InP PiN Photodiode' by Mr. Jibrán Ahmed Abbasi of Pakistan; 'Pure Methane Storage on Olive Stones based Microporous Activated Carbon for Vehicular Applications' by Ms. Ben Yahia Sonia of Tunisia; 'Design of the Microreactor for the Heterogeneous Catalysis' by Ms. Nouri Hanen of Tunisia; 'Emergence And Development Of Nanotechnology In Uganda, East Africa' by Ms. Philippa Ngaju of Uganda; and

‘Some Biomedical Applications of Chitosan Based Hybrid Nanoparticles’ by Mr. Nguyen Ngoc Thinh of Vietnam.

12 scientific papers presented by Malaysian scientists were on ‘Synthesis of ZnO Nanoparticles via the Sol gel Technique and their Use in Solar Photo Catalytic Degradation’ by Prof. Dr. Abdul Amir Hassan Kadhum of the Department of Chemical Engineering, UKM; ‘Improvement of Pressure Driven Membrane Performance Through Nanotechnology’ by Prof. Abdul Wahab Mohammad of the Department of Chemical and Process Engineering, UKM; ‘Nanocellulose from Mengkuang for Biocomposite Application’ by Prof. Ibrahim Abdullah, Professor of Physical / Polymer Chemistry, School of Chemical Sciences and Food Technology, UKM; ‘Metal Oxide Nanoparticle Synthesis Using Microwave Technique’ by Prof. Shahidan Radiman, Deputy Dean, Undergraduate and Alumni, Faculty of Science and Technology, UKM; ‘Role of Nanoparticles in Modifying Contact Performance between Electrode and Current Collector of a Supercapacitor’ by Prof. Dr. Mohammad Deraman; ‘Properties of M Fe₂O₄ (M= Mn and Zn) Ferrite Nanoparticles Synthesized Via Thermal Treatment Method’ by Prof. Abd Halim Shaari, Department of Physics, Universiti Putra Malaysia (UPM), Serdang; ‘Metal Oxide Nanostructure for Photoelectrochemical Cell’ by Associate Prof. Mohd. Yusri Abd. Rahman; ‘Nanobioconvergence’ by Prof. Ille Christine Gebeshuber; ‘Towards a Strategic Nanotechnology Action Plan in OIC Countries’ by Prof. Emeritus Muhammad Yahaya, School of Applied Physics, UKM; ‘Fuel Cell’ by Prof. Ir. Dr. Wan Ramli Bin Wan Daud, Director, Fuel Cell Institute, UKM; ‘Localized Surface Plasmon Resonance (LSPR) of Gold Nanoparticles to Detect Formaldehyde’ by Prof. Muhamad Mat Salleh, IMEN, UKM; and ‘Low-Temperature Catalyst-Free Formation of Carbon Nitride Nanostructures using Plasma Enhanced Chemical Vapour Deposition’ by Prof. Datin Saadah Abdul Rahman, Leader, Low Dimensional Materials Research Centre, Department of Physics, Universiti Malaya, Kuala Lumpur.

At the end of the Technical Sessions, Prof. Arun P. Kulshreshtha, Director, NAM S&T Centre made a presentation on ‘The Role of the NAM S&T Centre for South – South Cooperation in Science & Technology’. Subsequently, there was considerable deliberation and debate on generating a set of recommendations titled ‘Bangi Recommendations on Nanotechnology in the Edge of Convergence’, which was adopted during the Closing Session.

A Poster Session was also organised concurrently with the workshop presentations at which nine posters were displayed by Malaysian scholars.

The Workshop ended with the handing over of the Participation and Sponsorship Certificates to the participants and sponsors of the Workshop, concluding remarks and the Vote of Thanks.

The participants thanked the organisers for the successful and fruitful organisation of the Workshop and for excellent hospitality and arrangements made for the delegates, and unanimously hoped that more similar events will be held in future with a focus on South-South cooperation.