

74th Annual Meeting of the Indian Academy of Sciences*

The 74th Annual Meeting of the Indian Academy of Sciences began with the inaugural presidential address by D. Balasubramaniam (L.V. Prasad Eye Institute, Hyderabad). He elaborated on the importance of human eye lens and how age-dependent changes make the lens lose efficiency in terms of transparency accommodation and focus. He also mentioned that about five million cataract surgeries are performed in India every year at a cost Rs 1500 crore. Balasubramaniam also described photochemical and biochemical processes involved in cataract genesis and potential ways to delay its effects.

The special lecture on 'Fascinating dynamics of soft matter' by A. K. Sood (IISc, Bangalore) brought forward interesting facts on the application of electric field to colloids leading to an ultrasensitive immunoassay. This technology has its applications in many diagnostic tests.

Optical properties of hybrid nanomaterials were discussed by K. George Thomas (NIIST, Thiruvananthapuram). He dwelt on the recently initiated research programme at NIIST, on design of nanoparticle conjugates of organic or inorganic molecules. The presentation provided examples of modulating the optical properties of nanomaterials by integrating them into higher-order assemblies using electrostatic or supra-molecular covalent approaches. The presentation also highlighted their recent effort to understand the interfacial properties of hybrid nanomaterials and their potential application in optoelectronic systems.

Understanding the genetic regulators of plant forms and their exploitation to manipulate plant architecture was presented by Usha Vijayaraghavan (IISc) in a lecture entitled 'The making of flowering stem: lessons from molecular genetic analysis of flowering in model plants'. She discussed the different regulatory factors responsible for inflorescence in different plants.

The talk on 'Isotropy of quadratic forms' by V. Suresh (University of Hyderabad), discussed the isotropy of quadratic forms over function fields of p -adic curves.

The post-lunch session for day one opened with a symposium on 'Complexity and computation in natural sciences', chaired by Rahul Pandit (IISc) and had four lecture presentations.

M. Barma (TIFR, Mumbai) presented a lecture on 'Complexity in stochastic processes and statistical physics'. This presentation was followed by a talk by Somdatta Sinha (CCMB, Hyderabad) who addressed some issues on common designs in the regulation of complex biochemical pathways and their functional implications in the face of ever changing environment.

B. N. Goswami (Indian Institute of Tropical Meteorology (IITM), Pune) elaborated on the problems of projecting Indian monsoon under a climate-change scenario. He mentioned that currently available ocean-atmosphere coupled models are unreliable for any projections because the models do not stimulate regional monsoonal climate with adequate reliability and a dedicated system with multi-petaflop computing power is required to achieve climate prediction for the next century.

An overview of complexity in turbulence was provided by Rahul Pandit of IISc, Bangalore who provided some illustrative examples based on his work done about how we can characterize the complexity of turbulence.

Day one of the meeting concluded with an interesting and informative public lecture on 'Delhi – the city of many gates' by Narayani Gupta (Jamia Millia Islamia, New Delhi). She discussed about history of Delhi, its rulers and descendents.

The second day of the meeting opened with an enlightening lecture on haematology research by Mammen Chandy (CMC, Vellore). He discussed details of the research on haematology of thalassaemia and other patients with blood disorders carried out in CMC. Chandy explained that the pharmacokinetics and pharmacogenetics of different drugs vary in different patients, and thus one has to be careful with patients undergoing bone marrow transplants.

Several outstanding issues on the impact of climate change on India's monsoonal climate were discussed by K. Krishna Kumar (IITM). Considering climate change as the greatest challenge to humanity, he warned that climate change could have significant impact on natural systems like forests, water availability, agriculture, fishery and human health.

Banibrata Mukhopadhyay (IISc) delivered a lecture on measuring the spin of black holes in the universe, in which she mentioned that there are observational evidences for black holes in the universe.

A talk on microtubule dynamics, mitosis and cancer chemotherapy was presented by Dulal Panda (IIT, Mumbai). He emphasized the role of microtubules in various cellular functions, including mitosis.

The role of inertia in micro-scale transport process was presented by Ganesh Subramaniam (JNCASR, Bangalore). He highlighted the importance of inertial effects in flow processes on scale of suspended drop or particles in complex fluids.

The second symposium of the meeting was on 'Women in science'. The panel members that included Vineeta Bal, R. Gadagkar, Saman Habib, Sujatha Ramdorai, Indira Nath and Shanti Prasanna arrived on a common platform to address the issues concerning women scientists of India. The symposium was chaired by Rohini Godbole (IISc).

The post-lunch session of day two included three lecture presentations by fellows and associates of the Academy. P. K. Das (IISc) in his talk on 'Application of second harmonic Rayleigh scattering', presented application of Rayleigh scattering techniques in determining dissociation constant of a weak organic acid, stoichiometry of a supramolecular complex and critical micelle concentration of a surfactant.

Some interesting findings about the nature and evolution of deep mantle and its link to primary geodynamic processes was presented by Anil Kumar (NGRI, Hyderabad) in a talk entitled 'Kimberlites as probes of the earth's mantle'.

U. S. Bhalla (NCBS, Bangalore) discussed recent research on odorant identity, their discrimination and location in mammals.

*A report on the 74th Annual Meeting of the Indian Academy of Sciences, Bangalore, held at the Indian Institute of Technology, Delhi from 31 October to 2 November 2008.

The symposium on 'Energy' chaired by S. Sivaram (National Chemical Laboratory, Pune) commenced with a talk on 'Silicon-based photovoltaic technologies' by G. Rajeswaran (Moser Baer Photovoltaic Ltd, New Delhi). He highlighted the advances in crystalline and hydrogenated amorphous silicon photovoltaic technologies that have been incorporated into recent commercial production lines and the technology opportunities that can be further tapped.

R. Rajaraman (JNU, New Delhi) presented an overview of the present status and future prospects of nuclear energy at both national and international levels. A talk on the engagement of CSMCRI in the engagement of energy from bioresources was delivered by P. K. Ghose

(CSMCRI, Bhavnagar). He discussed the importance of jatropha and seaweeds as an important source of biofuel.

The third day of the meeting opened with a special lecture on 'Mammalian prolactin – an ancient but still a mysterious hormone' by K. Muralidhar (University of Delhi). He discussed the role of prolactin in some of the interesting physiological and behaviour processes in all vertebrates.

S. K. Apte (BARC, Mumbai) presented a talk on 'Living dangerously: the *Deinococcus* way'. *Deinococcus* is an extremophile capable of surviving high doses of UV and IR and it has been engineered for bioremediation of mercury and toluene from nuclear wastes. *Deinococcus* offers an exciting opportunity for

basic research and for the development of biotechnologies related to nuclear energy.

The next presentation was on genomic and proteomic approaches in cancer classification and treatment by K. Somasundaram (IISc). He presented data related to gene signatures which could identify specific grades of glioma, subgroups of patients with better response to treatment and potential therapeutic targets.

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MEETING REPORT

Emerging directions in global education*

Emerging Directions in Global Education (EDGE, www.edgeforum.in) is an initiative to bring together educational leaders, practitioners, decision makers from the public and private sectors, and thought leaders from India and across the globe to create a virtual roadmap for the Indian higher education sector. The second edition of EDGE was organized recently. The conference attracted over 250 delegates who represented the decision-makers of some of the leading higher educational institutions in the country, as well as international participants from the United States, the European Union, Australia, Singapore and other countries.

The first conference, held between the 3 and 5 March 2008 marked the beginning with the release of the 'India Education Vision Document' that traced the broad vision outlining the aims and the broad contours of higher education in India. The document reflected the ideas, goals and missions, priorities, hopes and aspirations for Indian higher education.

EDGE 2009 placed the deliberations of the conference within the context of

transformation of higher education for global opportunities. In his inaugural address, K. Kasturirangan (Chairperson, Vision Group, EDGE and Director, NIAS, Bangalore) stated that, as globalization pervades all facets of our life, managing change is the need of the hour, as educational institutions transform to keep pace with the global forces of change.

In keeping with this agenda, the theme of EDGE 2009 was – Transforming Educational Institutions for Global Opportunities – Directions for Higher Education. The conference, inaugurated by Sheila Dikshit (Chief Minister, Delhi), had various interesting sessions, workshops and exhibitions. In addition, two new components were added this year, the Young EDGE award and a segment on research in higher education.

The incisive comments as well as the encouraging remarks from both Sheila Dikshit and Montek Singh Ahluwalia (Chairman, Planning Commission), set the tone for the conference, pointing out 'Can't we just get going?', and the importance of not being caught with work done in the past and looking forward to what could be done in the future. Montek Singh Ahluwalia was the recipient of the EDGE-Education Personality of the Year Award 2009, for his indispensable role as

Chairman of the Planning Commission and his contribution to the higher education sector in that capacity. The Young EDGE Award, marking the efforts of a person in the field of higher education below the age of 45 years, was given to Vidya Yeravdekar, Symbiosis University, Pune for her contributions, especially towards internationalization of higher education.

Three pre-conference workshops were organized this year: (i) Building Partnerships between the US and Indian Institutions of Higher Education (USIEF), (ii) Leadership and Progressive Governance for Educational Institutions (Indian School of Business, Hyderabad), (iii) Academic Counseling for Career Planning (The College Board, USA).

In the plenary session, Tan Chorh Chuan (President, National University of Singapore (NUS)), spoke about shaping universities that help shape global education. He pointed out that universities which aspire to stand out globally need to not only cope with the challenges posed by change, but also shape the future. One of the key drivers of change in the present scenario is globalization or 'shrinking globe', leading to a higher interconnectedness between institutions.

Chuan's description of the journey of NUS from a state-run university to a

*A report on the second in the series of conferences on 'Emerging Directions in Global Education' organized between the 9 and 11 February 2009 at the India Habitat Centre, New Delhi.