

## Twenty-second mid-year meeting of the Indian Academy of Sciences\*

A day before the meeting began, two mini-symposia were organized for teachers and students, one each on life sciences and earth sciences. The meeting opened with a special lecture on protein folding by Jayant Udgaonkar (National Centre for Biological Sciences, Bangalore). He raised fundamental questions about protein folding mechanism – do proteins take shape gradually, are these flip-flops, whether outline of the shapes comes first or the details and is there only one folding sequence for each protein? The second special lecture was delivered by Mustansir Barma (Tata Institute of Fundamental Research (TIFR), Mumbai), who gave examples of ordered states induced by entropy. A public lecture was delivered by Anil Sadgopal (All India Forum for Right to Education, Bhopal), who criticized the Right to Education Act and declared *Sarva Siksha Abhiyan* as one of the lost goals.

Vidya A. Arankalle (National Institute of Virology, Pune) shared the story of development of a vaccine against Hepatitis E. Her group tested encapsulated vaccine of hepatitis E virus neutralizing epitope region (DNA–protein combination) in rhesus monkeys. The vaccine showed promising results but has not been taken up by companies for human clinical trials yet. Hepatitis C virus (HCV) infection is another major public health problem with limited established therapeutic options. Saumitra Das (Indian Institute of Science (IISc), Bangalore) in his lecture explained how an attractive target for antiviral drug design can be exploited by understanding ‘internal ribosome entry site’-mediated translation of HCV RNA – unique because of its difference from general cap dependent translation and its importance in viral life cycle.

Tapas Kundu (Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore) talked about the role of NPM1, a nucleolar protein and its hyperacetylation activity, an indicator in manifestation of oral cancer. Surendra K. Sharma (All India Institute of Medical Sciences, New Delhi) said that snoring is

now known to be associated with obstructive sleep apnea, a sleep disorder characterized by pauses in breathing, causing adverse health effects. Suvendra N. Bhat-tacharyya’s group (Indian Institute of Chemical Biology, Kolkata) has recently studied region-specific expression of miR128a in mouse brain, and is attempting the purification of P-bodies, formed by aggregation of miRNA repressed mRNAs. Mukesh Jain (National Institute of Plant Genome Research, New Delhi) discussed characterization of chickpea transcriptome. Several chickpea transcripts showing tissue-specific expression have been identified and compared with other species within the plant kingdom. He also highlighted chickpea transcriptome database developed by his group.

G. Beig (Indian Institute of Tropical Meteorology (IITM), Pune) talked about chemical weather forecasting capability being developed at IITM. This will help in validating and quantifying emissions (aerosols precursors and ozone), and in examining the movement of pollutants over long distances. Nitin T. Patil’s (Indian Institute of Chemical Technology, Hyderabad) talk focused on developing new Au-catalysed cascade processes for the synthesis of drug or natural product-like molecules. Amitava Das (Central Salt and Marine Chemicals Research Institute, Bhavnagar) discussed designing of receptors for molecular recognition and synthesis of sensitizer dye molecules. His group has recently developed a zinc complex receptor that can be used to monitor hydrolysis reaction of pyrophosphate by alkaline phosphatase. R. Murugavel (Indian Institute of Technology-Bombay, Mumbai) explained the reactions of several bulky monoaryl esters of phosphoric acid with a variety of main group and transition metal cations under diverse reaction conditions.

The role of glass boundaries in the movement of polycrystals was comprehended by Rajesh Ganapathy (JNCASR). Jayant R. Haritsa (IISc) talked about ‘plan diagrams’, which could address selectivity estimation errors, a problem faced by database management systems. Amlan J. Pal (Indian Association for the Cultivation of Science, Kolkata) discussed the mechanism of molecular rectification. Molecular

rectifier is a monolayer of donor molecules and a monolayer of acceptor molecules in sequence. He explained how the systems where bi-stability is a molecular phenomenon can be used to achieve high density memory elements.

Shiraz Minwalla (TIFR) explained a direct analysis of the equations of gravity in asymptotically AdS spaces and how this analysis yields useful information for both fluid dynamics and gravity. Mohammad Sami (Jamia Millia Islamia, New Delhi) mentioned the cosmological constant problem and alternatives to dark energy. Amita Das (Institute for Plasma Research, Gandhinagar) showed that slowly propagating nonlinear electromagnetic disturbances can penetrate high density plasma, with applications such as trapping of current pulses (basis for plasma tweezers), and collimation, guiding and bifurcation of electron current pulses (basis for plasma photonics). Jaywant H. Arakeri’s group (IISc) studied convection in a long vertical tube and showed, for the first time, that it is possible to obtain the flux as  $Nu \sim Ra^{1/2}$ , as proposed by Kraichnan in 1962.

The coverage of space by random sets and its connections with biology and statistical physics was described by Rahul Roy (Indian Statistical Institute, New Delhi). A. J. Parameswaran (TIFR) talked about the Tanaka category as the representation category of a group, and his work on monodromy and holonomy groups. Sujit Roy (IIT-Bhubaneswar, Bhubaneswar) elucidated the win-win paradigm of cooperative multimetallic catalysis, which enables atom economy, efficiency, selectivity and eco-economic viability. Vivek V. Ranade (National Chemical Laboratory, Pune) focused on the evaluation of computational fluid dynamics models of flow in stirred tanks based on: (i) hysteresis in the solid suspensions with respect to impeller speed and (ii) settling of solid cloud with sudden stoppage of impeller.

At the end of the meeting it was announced that the 77th annual meeting of the Academy will be held at Ahmedabad during 18–20 November.

**Geethanjali Monto, Megha Prakash, Jaimini Sarkar (S. Ramaseshan Fellows) and Richa Malhotra\***

\*e-mail: rchmalhotra@gmail.com

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