

Prof. Y. T. Thathachari Research Award for Science–2008 and the Bhramara Trust Lifetime Achievement Award

The Prof. Y. T. Thathachari Prestigious Research Award for Science–2008 has been announced. The Award has been shared by Alok Banerjee (UGC-DAE Consortium for Scientific Research, Indore); T. N. Guru Row (Indian Institute of Science, Bangalore) and R. Shankar (Institute for Mathematical Sciences, Chennai). The award consists of a citation, a memento and a cheque for Rs 50 thousand for each awardee.

Alok Banerjee is an experimental physicist working in the area of low-temperature magnetic properties of materials. He has studied the half-doped rare earth alkaline earth manganites which exhibit transition from a ferromagnetic metallic to anti-ferromagnetic insulating state as the temperature is lowered. This results in the co-existence of a low-temperature crystalline phase in equilibrium with a super-cooled, high-temperature glassy phase. Banerjee has studied the kinetics of the transition between these two states using magnetization and electrical conductivity studies. He is also currently doing magnetic circular dichroic studies using synchrotron radiation. He has constructed several set-ups indigenously for magnetization and AC susceptibility measurements, which perform better than imported set-ups.

T. N. Guru Row has made significant contributions to the understanding of inter-molecular interactions in controlling the structure of molecular crystals with the help of both theoretical and

experimental studies using X-ray diffraction (XRD). His contributions are in the areas of charge density analysis, phase transitions, crystal engineering and high resolution powder XRD. Row's experimental analysis of structural motifs of inorganic layered complex oxides and their photo-degradation studies herald a new generation of materials. Many new structures have been found by his group which help chemists, physicists and biologists design innovative molecular materials for selected applications.

R. Shankar is a theoretical physicist who has made fundamental contributions to the generalized exclusion principle in low-dimensional quantum spin systems, relating exclusion statistics, exchange statistics and virial coefficients in fractional quantum Hall systems and other model systems. He has made notable contributions to problems in frustrated quantum magnetism and quantum Hall transition. Shankar has predicted some novel electric field effects in graphene. He has also suggested a mechanism to generate topological qubits, paving the way for a condensed matter realization of qubits in quantum computation. More recently, he has reconstructed successfully the wave source of the great tsunami of 2004.

The awards were presented on 14 March 2009 in JSS Medical College, Bangalore. C. N. R. Rao presided over the function and H. H. Shivrathri Desikendra Mahaswamiji of the Suttur Math graced the occasion.

The Trust also gave its Lifetime Achievement Award to K. Kasturirangan (Director, National Institute of Advanced Studies, Bangalore) for his contribution to the Indian space research programme for the period 1994–2003. During this period the programme witnessed several major milestones, such as the launching of the PSL and GSL vehicles, and the remote sensing satellites IRS 1C and 1D, and several new generation communication satellites.

B. V. Sreekantan spoke about Kasturirangan's contribution to the study of cosmic ray and gamma ray sources, and his efforts at ISRO to make India one of the six space-faring nations in the world.

Rao, in his presidential address, referred to the importance of science to the growth of any nation and mentioned Darwin's theory of evolution and the discovery of wireless communication by J. C. Bose as monumental contributions to science. He urged the youth of the country to take up research in basic and applied sciences.

The Trust also celebrated the completion of 15 years of service to society. K. B. Ganapathy, Editor, *Star of Mysore*, spoke about the contributions of the Trust to the society.

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MEETING REPORT

Emerging trends in remote sensing*

The objective of the short-term course on emerging trends in remote sensing was to discuss the cutting-edge technologies of

*A report on the short-term course on 'Emerging trends in remote sensing: imaging spectroscopy and natural resource mapping' held between 8 and 12 December 2008, at the Department of Earth Sciences, Indian Institute of Technology Bombay, Mumbai, with support from NRDMS, Department of Science and Technology, New Delhi.

hyperspectral remote sensing among the professionals working in field of optical remote sensing. Twenty participants out of 110 applications received, were invited for this training programme after a critical appraisal of the applications by the selection committee. The participants represented defence, academics, research institutions and private organizations working in the field.

In the inaugural session, D. Ramakrishnan (Indian Institute of Technology Bombay

(IITB), Mumbai) presented a brief introduction to the course. The Director, IITB and Head, Department of Earth Sciences, IITB graced the occasion. The entire programme spanned five days with lectures, practical laboratory work and field data collection. All the activities were meticulously organized. The short-term course started with an overview of hyperspectral remote sensing and reflectance spectroscopy by D. Ramakrishnan. A. N. Swamy (Andhra University) joined the demon-

stration with lectures on processing of hyperspectral data and S. K. De (GSI, Bangalore) on signature database management. B. K. Mohan (IITB) delivered a talk on image classification and G. Mathew (IITB) shared his experiences in thermal emission and planetary explorations. A fieldwork for spectral signature collection using spectroradiometers (ASD and GER) followed by data processing session in the laboratory exposed all the participants to real-time data-acquisition and processing. The lectures on the application aspects of hyperspectral remote sensing had a wide coverage of agriculture and forestry (R. N. Sahoo, IARI),

geology and marine biology (D. Ramakrishnan, IITB), and snow and ice (H. S. Negi, SASE). The afternoon sessions included processing the datasets using ENVI software. Representatives from Sierra Atlantic helped make the software learning easier. Research scholars from IITB enthusiastically joined the practical sessions.

The very academic environment of IITB contributed to the satisfaction of all the participants. However, inclusion of focused case studies can strengthen these types of training programmes. The gap areas will help the participants to come up with newer project proposals and case

studies in this specialized subfield of remote sensing. Hopefully, the funding agencies will be able to recognize the importance of this and applications in the subfields of environmental studies and natural resource management. Only with their support to develop newer algorithms can help such training courses become to operation-level applications.

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MEETING REPORT

Functional biodiversity and ecophysiology of animals*

'The worst thing that can happen... is not energy depletion, economic collapse, limited nuclear war, or conquest by a totalitarian government. As terrible as these catastrophes will be for us, they can be repaired within a few generations. The one process ongoing... that will take millions of years to correct, is the loss of genetic and species diversity by the destruction of natural habitats. This is the folly our descendants are least likely to forgive us.'

'As genomics and biomedicine are to human health, so ecology and conservation biology are to the planet's health. Unfortunately, compared with their sister disciplines, ecology and conservation biology are still disadvantaged.'

E. O. Wilson^{1,2}

Almost three decades later, Wilson's prophecy is borne out by accumulating evidence of serious anthropogenic threat to biodiversity, which constitutes the very basis of human survival on earth. It is apt that this report begins with quotes by Wilson, who has not only extensively championed the cause of biodiversity

conservation, advocated the need for studies on bioprospecting, ecosystem functioning and evolutionary biology, but also introduced the term 'biodiversity' for the first time³. The area of conservation biology currently needs more research emphasis than ever before. Therefore, a symposium on 'Functional biodiversity and ecophysiology of animals' was recently organized. Drastic changes in land use, enrichment in the nitrogen cycles and emission of greenhouse gases are just a few of the major anthropogenic activities, which have contributed to the accelerating decline in the biological diversity. Basically of course, all these are the outcome of overwhelming human dominance on the earth due to the phenomenal population growth in the last century.

Functional biodiversity focuses on the diversity of ecosystem functions, provided by the biological community, while ecosystem functioning is a measure of the changes occurring in ecosystem processes⁴. However, the changes occurring at the level of ecosystems and adaptations in organisms under the influence of human-driven activities are not adequately understood. Consequently, functional biodiversity is rapidly emerging as an interdisciplinary area of research, involving the study of ecosystem processes as well as behavioural, physiological and ecological adaptations and interactions amongst the organisms. The goal of the

present symposium was to provide a forum for an interactive discussion, to understand the emerging trends in ecosystem functioning and to assist in the germination of new ideas and approaches in this area. The meeting was attended by about 98 participants (including 12 invited speakers) from 14 different states of India.

In his keynote lecture, S. Ayyappan (Indian Council of Agricultural Research, New Delhi) provided an overview of freshwater and marine species with high potential in aquaculture. He suggested various measures to meet the predicted increase in the per capita demand of the protein-rich fish food in future. Ayyappan referred to the fish breeding techniques and discussed aquaculture potential with respect to the available resources in different states of India. He also emphasized economic and environmental benefits of multi-farming systems, for instance, greater profitability of fish and rice farming compared to rice farming alone.

There were altogether eight sessions during the three days of the symposium. The first two sessions dealt with the basic issues of biodiversity richness, conservation and management in terrestrial and aquatic ecosystems respectively. The first speaker, J. S. Singh (Banaras Hindu University (BHU), Varanasi) drew attention to the current high rate of species extinctions and stressed the need to understand the processes of speciation, endemism,

*A report on the symposium on 'Functional biodiversity and ecophysiology of animals', organized at the Department of Zoology, Centre of Advanced Study, Banaras Hindu University, Varanasi during 21–23 February 2009.