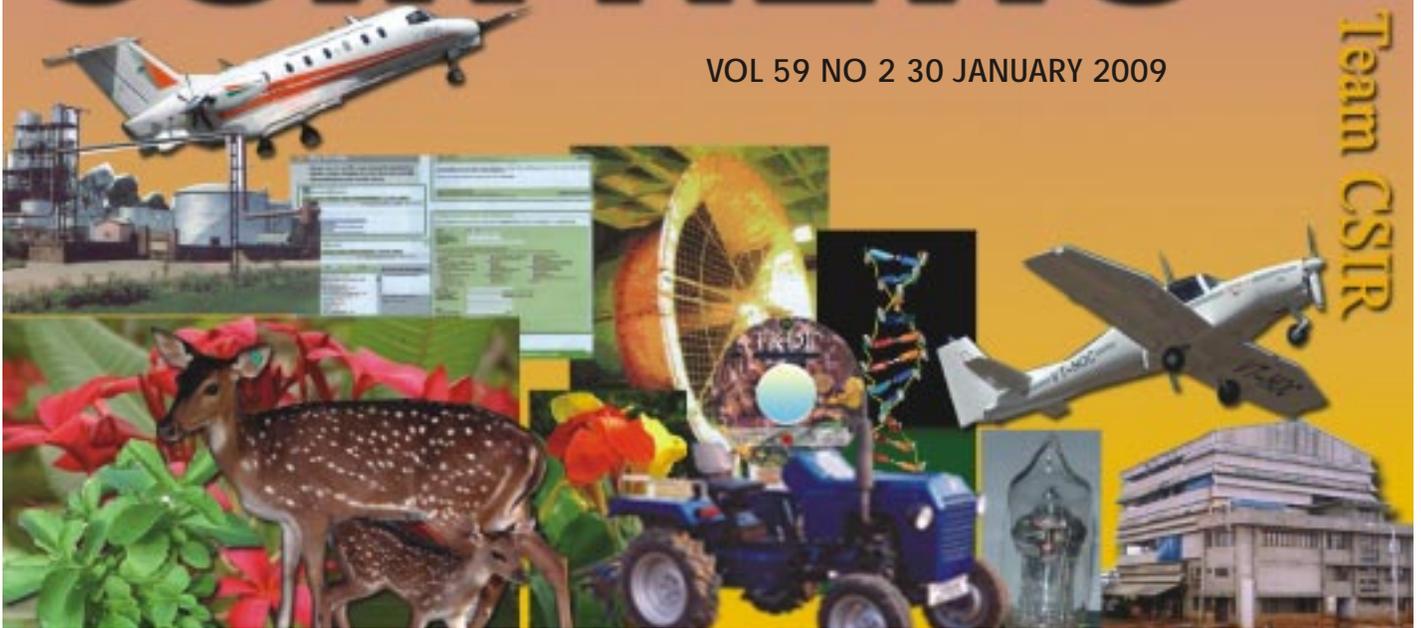


CSIR NEWS

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Team CSIR



NIO's newly acquired RV *Sindhu Sankalp*

Director of the National Institute of Oceanography (NIO), Goa, along with his staff welcomed the newly acquired Research Vessel *Sindhu Sankalp*, which arrived at the Captain of Ports Jetty, Panaji. She sailed on 14 November 2008 from the port of Dunedin, New Zealand. Besides the regular officers and crew, three members of NIO and Mr Malcolm A Macleod, previous owner, accompanied the vessel. The 56 m long and 9 m wide vessel with a gross tonnage of 709 tonnes, would be used to study the seas around India.





Speaking on this occasion, NIO Director Dr Satish Shetye observed that the seas around India (the Arabian Sea, the Bay of Bengal and the equatorial North Indian Ocean) are unique in several respects. This uniqueness arises from two factors: First, the water of the Indian Ocean is blocked in the north by landmass (Asia) from having access to polar region; Second, because of the monsoon, these waters experience one of the strongest seasonal variability of atmospheric conditions anywhere in the world oceans. This gives rise to large variations of wind stress, evaporation, precipitation and coastal run-off that not only make the dynamics of this water unique, but also have a profound influence on biogeochemical cycles. NIO has made an impact on the global oceanographic research arena by sustained observations of these waters.

“The acquisition of RV *Sindhu Sankalp* is an important milestone in the history of NIO,” Dr Shetye further added. “It will help the scientists advance into the seas in and around Indian waters for research purposes.”

Earlier, Dr P. S. Rao, Senior Scientist and Project Leader, briefed the gathering on the vessel acquisition process. Dr Rao said that the vessel would be modified to suit the requirements of NIO by getting it fitted with necessary scientific equipment. As the vessel is proven to be a stable platform, the scientists can plan experiments round the year.

Mr Sanjeev Afzalpurkar proposed the vote of thanks.

New Processes released by CFTRI

Mini Versatile *Dhal* Mill for Rural Areas

The Central Food Technological Research Institute (CFTRI), Mysore, has designed a *versatile mini dhal mill* to dehusk all kind of pulses. Basically the unit consists of three principal components, i.e. the dehusking, aspiration and grading systems. The unit is specifically suitable for rural areas and has a good market potential for a large number of these units in Maharashtra, Orissa, Madhya Pradesh, Bihar and Uttar Pradesh. It will prove beneficial to the pulse farming community and will be a boon for agro-based economy in the rural sector.

The salient features of this mini dhal mill include: 75-77% yield of *dhal* and dehulling ratio around 97-98% with breakage limited to 2-4%. The unit has the capacity to process 150 kg *dhal* per hour.

All variety of pulses can be processed and the operation is user friendly. Since the unit has been designed for dry pre-milling, minimum dust is generated during

the operation. It has an adjustable clearance to suit different size of grains. Also, the byproducts generated such as husk and broken *dhals* could be used for animal feeds. The investment required is quite small and well suited for cottage and rural industry.



Process for Preparation of Expanded Horse Gram

Horse gram is generally used after soaking, germination, cooking and also as extract or soup. *Papad* from horse gram flour are also prepared in southern region of India. Pulses like Bengal gram and peas are available in puffed / expanded form but not horse gram,



because raw horse gram does not give puffed or expanded product at normal moisture content and conventional puffing conditions. A process has been developed for expanded horse gram to give an

acceptable expanded ready-to-eat snack product. The product has 'reduced anti-nutritional factors' with improved protein digestibility.

The product is crisp, crunchy

and shelf stable. It can be used as such or as a snack after salting or spicing. It can also be added as an ingredient in cereal bar or *chikki*. The process can be had from the institute for commercialization.

Natural Flavourant from Swallow Roots

Decalepis hamiltonii is a monotypic genus found in the Deccan (South) peninsula, mostly in the forest regions of Eastern and Western Ghats. The swallow root has a strong aromatic odour and sweet taste, and it is used in traditional Indian medicine as an appetizer and blood purifier. The sliced root is pickled as such or along with lime fruit where it acts as a flavourant as well as a preservative. The chemical compound responsible for the aroma and taste of

D. hamiltonii root is 2-hydroxy-4-methoxy benzaldehyde (HMB), which is an isomer of vanillin.

CFTRI has developed a process for optimizing extraction and isolation of HMB from swallow roots. Swallow roots are grated and subjected to steam-hydro distillation. The organic fraction of the distillate contains HMB as the major volatile compound along with other flavour compounds. The distillate is then subjected to solvent extraction. After desolventization,

the extract is crystallized in a low polar solvent to get the final product. HMB (2-hydroxy-4-methoxy benzaldehyde) from swallow roots finds application as a natural flavourant in beverages, dairy products and bakery products. It can also be used as a natural preservative in many preparations.

The principal plant and machinery required include: wet comminuting mill, steam-hydro distillation still, extraction unit, mixing tank, refrigerated tanks and

chilled water plant. The other auxiliary requirements are boiler, generators, quality control laboratory and effluent treatment systems. The process know-how is available from the institute for commercial exploitation.



Decalepis hamiltonii plant



Swallow roots



Nanoscale Textures and Metal-Insulator Transitions in Correlated Electron Systems

Dr Pinaki Majumdar's Shanti Swarup Bhatnagar Prize-winning Work

Dr Pinaki Majumdar of the Harish-Chandra Research Institute (HRI), Allahabad, has been awarded the Bhatnagar Prize in Physical Sciences for the year 2007. His area of research is materials theory with focus on topics like magnetism and superconductivity. To set his work in context it would help to quickly review the link between solid state theory and materials science.

The modern theory of solids came into being in 1930's, after the advent of quantum mechanics. The first triumph was in explaining the different electrical properties of solids in terms of electronic bands in a crystal. A partially filled band led to a metal, a fully filled band to an insulator, and a full band with a 'narrow gap' led to a semiconductor. The 1940's saw the development of semiconductor-based transistors, using the microscopic understanding gained from the theory. Silicon based semiconductors have dominated technology for the last six decades.

While the silicon story is well known, there are two properties of silicon as a 'device material' that deserve highlighting: (i) Si needs to be 'ultra pure' to function in a device, and (ii) the effects of electron-electron interactions, etc., in Si are negligible. For a theorist, Si is a 'clean' non-interacting system. The physics is simple, almost boring! There are no



uncertainties in our understanding.

The last couple of decades have seen a shift of focus to more complex materials, many of them oxides of transition metals, where a variety of phenomena emerge due to strong interactions between the electrons. The most famous in this category are the copper oxide based high T_c superconductors. Close at their heels came the 'colossal magneto resistance' (CMR) manganites. There have been many others, e.g., cobaltates with unusual thermopower, and 'multiferroics'—capable of huge electric or magnetic response. They all involve unusual collective states arising from interactions among electrons, phonons, magnetic moments, etc. and the 1930's approach to solids is woefully inadequate. A new branch of solid state physics - the theory of 'correlated electrons' came into being.

While there is no single theory that describes cuprates, manganites

and multiferroics, there is a common feature that all these materials involve multiple competing phases. Small changes in doping, pressure, strain, etc. could, for example, convert an insulator into a superconductor (in the cuprates) or an antiferromagnet to a ferromagnet (in the manganites). The proximity of competing phases and their tiny energy difference amplify the effect of small perturbations. In particular, dilute impurities that would be 'irrelevant' in a traditional metal (copper or gold, say) could now have a dramatic effect. Compared to our early example of silicon, the new materials necessarily involve strong interactions and often require an '*ab initio*' understanding of impurity effects. Interactions and disorder are no longer afterthoughts, they are the starting point of the theory. Unfortunately there are no readymade tools to approach a problem of this kind.

Dr Majumdar's major effort at HRI has been in developing methods for studying correlated electron systems in the presence of disorder, and understanding spatial textures in such systems. This is motivated by recent experiments (see Fig.1 for manganites) which suggest that in many materials matter at the nanoscale is very inhomogeneous. An understanding of the spatial character of such a state is key to controlling its transport properties, and possible

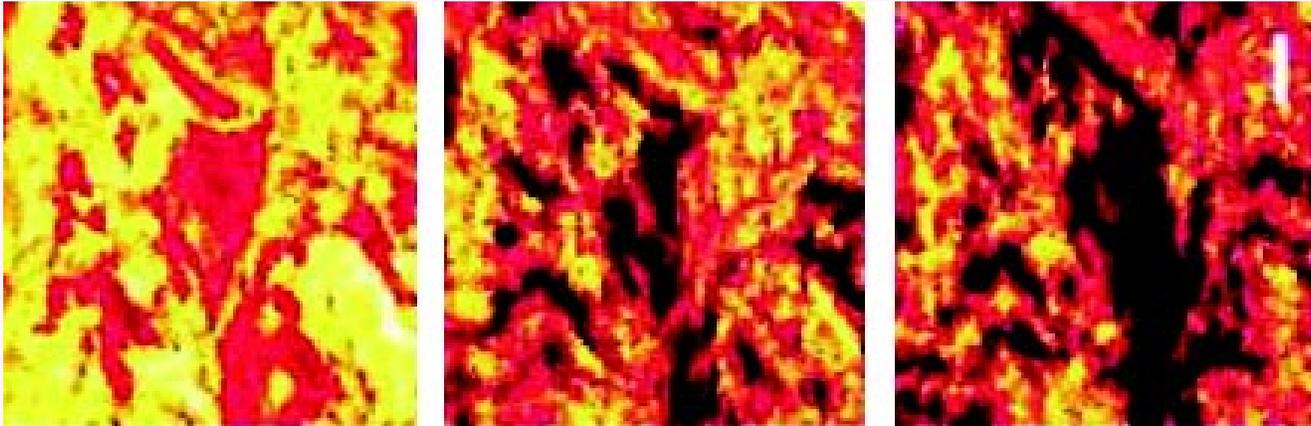


Figure 1: A pattern of coexisting insulating and ferromagnetic metallic regions in a manganite, measured using tunneling spectroscopy. The dark regions are metallic. The image is for a sample roughly 1 μm wide. The panels, left to right, are for increasing magnetic field

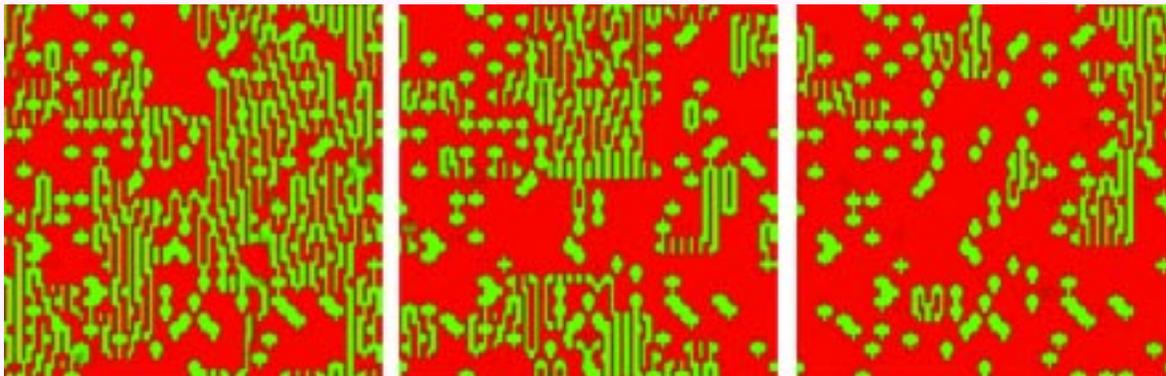


Figure 2: Result of a simulation exploring coexistence effects in the presence of dilute impurities. The red regions are ferromagnetic metals, and the panels, left to right, refer to increasing field.

use in devices. The computational tools developed by Dr Majumdar and his students helped clarify the unusual transport in the manganites and its relation to spatial textures. The typical result from a large scale simulation is shown in Fig.2, mimicking the experimental results in Fig.1. These calculations define the state of art, and now allow theoretical access to a wide range of complex materials.

Dr Majumdar's early schooling was in Bengal. He won a National Scholarship in the Secondary examination, studied at St. Xavier's College, Kolkata, for his class XI-XII, and did his B.E. in Electrical

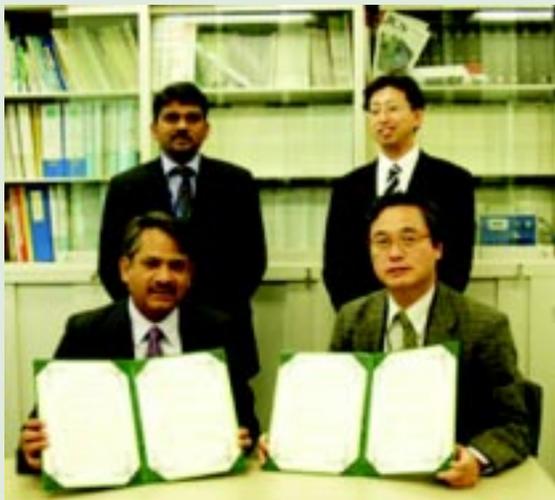
Engineering from Jadavpur University in 1986. He did Masters in Solid State Technology from IIT-Madras, winning an Institute Merit Prize and Medal for his work there, and joined the Physics Department at IISc Bangalore in 1990 for his Ph.D. He worked at IISc from 1990-96 with Prof. H. R. Krishnamurthy. Among his mentors were Prof. T. V. Ramakrishnan. He moved to Bell Laboratories, Lucent Technologies (formerly the AT&T Bell Labs) towards 1996 end and stayed on for two years as a postdoctoral fellow in the Theoretical Physics group. Much of his work at Bell Labs was done with Dr Peter Littlewood (now

head of the Cavendish Lab at Cambridge).

Dr Majumdar moved back to India in 1998 end and joined HRI as a Faculty Fellow. Over the years he got promoted, and became a Professor in 2007. He has guided one student to his Ph.D. and is working with several others currently. He has organized and taught at SERC schools for young researchers, and also organized Summer Schools at HRI to attract B.Sc. and M.Sc. students to research. He has held visiting positions at Cambridge and Oxford University, and the Institut Laue-Langevin in Grenoble.



IMMT signs MoU with NIMS



MoU documents being shown after signing by the signatories

The Institute of Minerals and Materials Technology (IMMT), Bhubaneswar and National Institute for Materials Science (NIMS), Tsukuba, Japan, have signed an MoU and there by agreed to collaborate with each other for sharing and advancement of knowledge, development of technology and human resources. The two institutions shall cooperate on “Fabrication of advanced ceramics by powder processing”. The cooperation will include exchange of researchers, exchange of information and publications on the research and implementation of the cooperative research of mutual interest.

The MoU was signed by Prof. B.K. Mishra, Director and Dr L. Besra, Scientist, CMC Department of IMMT and Prof. Yoshio Sakka, Managing Director, NIMS, and Dr Tetsuo Uchikoshi, Chief Researcher of Nanoceramics Center, NIMS, in a function organized at NIMS on 21 November 2008.

The initiative is the first of its kind for IMMT to kick start cooperation with a national research institute abroad.

MoU between NAL and Tata Advanced Materials Limited (TAML), Bangalore for Collaboration in Advanced Composites



Exchange of MoU document

An MoU was signed between National Aerospace Laboratories (NAL) and M/s Tata Advanced Materials Limited (TAML), Bangalore, on 27 November 2008 with the mutual intent of working together in the area of Advanced Composites for aerospace applications. NAL team led by NAL Director had visited TAML in November 2007 to see TAML's composite manufacturing facilities at their factory premises. With signing of the MoU both sides will have technical collaboration and work together in composite design activities. TAML's experienced and trained manpower, state of the art equipment and a comprehensive capability to undertake design, development, testing and manufacture of different types of composite products will be useful to NAL in its on-going and future civil aviation programmes and in turn, TAML will be benefited by NAL's vast expertise in the field of advanced composites. Tie-up between NAL and TAML will be one of public-private partnership working together for the benefit of industry, laboratory and the nation.

CSIO signs MoU with Panjab University, Chandigarh

The Central Scientific Instruments Organisation (CSIO) and Panjab University (PU), Chandigarh, have signed an MoU on occasion of the former's Foundation Day on 30 October 2008, to promote joint research work and human resource development. The areas identified for co-operation included Health Monitoring, Geo-Seismic and Disaster Management Instrumentation, Medical Instrumentation, Sensors/Transducers, Virtual Instrumentation, Soft Computing Techniques, Image Processing, Optical and Photonics-based Instrumentation, Physics-based Instrumentation, Material Science, Nanotechnology, Chemical and Biosensors, Chemistry and HRD.

The MoU was signed by Dr Pawan Kapur, Director, CSIO and Dr R.C. Sobti, Vice Chancellor, Panjab University.

Under the MoU, students of M.Sc., B.Tech., and M.Tech. in the respective areas of specialization at PU will be allowed to pursue their project work at CSIO and staff members from CSIO will be able to register for Ph.D. programmes at PU, with joint supervision on emerging areas of research and applications.

The MoU will help build stronger linkages between academia and R&D institutions towards quality manpower generation and utilization in various niche areas. It will also help in optimal utilization of R&D facilities in high priority area programmes of science & technology.

CSIR-UNB MoU for mutual cooperation



Exchange of MoU documents by Shri P.K. Ghosh, Finance Officer, UNB and Dr Naresh Kumar, Head, RDPD, CSIR. Prof. A. Basumajumdar, VC, UNB, presided over the function

The Council of Scientific & Industrial Research (CSIR) and the University of North Bengal (UNB), Siliguri – a state university endeavoring to provide quality education and research, have signed a Memorandum of Understanding (MoU) on 27 November 2008. CSIR and UNB have complementary endowments in academics and advance research, and the MoU is to facilitate a working arrangement to jointly move forward and provide greater dynamism and value for the benefit of both the organizations. The MoU was signed by Dr Naresh Kumar, Head, RDPD, on behalf of CSIR, and by Shri P.K. Ghosh, Finance Officer, UNB, on behalf of UNB.

Initially, the cooperation programme is proposed to be implemented with participation of UNB and a few select CSIR laboratories, viz. CMERI, CFTRI, CGCRI, CMFRI, IICB, IIP, NCL, NEIST and NPL as UNB's specific interest is in the areas of Biotechnology, Materials, Physics, Chemistry, Petroleum (energy) and Food Technology. CSIR scientists shall extend teaching support by giving lectures on topics of their expertise and those matching with and the UNB course curriculum.

Initially, up to ten students in a year shall be allocated summer training opportunity at the select CSIR laboratories, where they shall also be extended use of CSIR facilities. The University of North Bengal shall extend its facilities to CSIR scientists and researchers on reciprocal basis. The UNB shall also accredit participating CSIR scientists for guiding research leading to Ph.D. degree. Under the MoU, University of North Bengal and CSIR will also explore areas of mutual cooperation through workshops, symposia, short-term training courses, etc.



Asian Symposium on Medicinal Plants, Spices and Other Natural Products

The Indian Institute of Chemical Technology (IICT), Hyderabad, in association with UNESCO, the organization for Prohibition of Chemical Weapons (OPCW) and Department of Science & Technology (DST), organized the XIII Asian Symposium on Medicinal Plants, Spices and Other Natural Products (ASOMPS) at IICT during 3-6 November 2008. The

symposium focussed on Natural Products in Drug Discovery with Botany, Microbiology, Pharmacology, Natural Product Chemistry, Medicinal Plant Chemistry and Synthesis of Natural Products as the thematic areas. The deliberations were held in 11 sessions consisting of 16 plenary lectures, 53 invited lectures and about 200 poster presentations.

Speaking at the symposium, Dr J.S. Yadav, Director, IICT, pointed out that natural products are gaining popularity as more and more multinationals are on shopping spree in India looking for New Chemical Entities (NCEs) for various disorders such as cancer, diabetes, ulcer and HIV. This stems from the fact that incidences of side-effects are relatively lesser or nil in the case of natural products as compared to allopathic drugs. He informed that IICT has in the pipeline about 15 bioactives derived from natural products for HIV, tropical diseases, Alzheimer, Malaria, and for Memory



Asian Symposium on Medicinal Plants, Spices and Other Natural Products (ASOMPS) in progress

enhancing, etc.

Prof. Geoffrey A Cordell, Department of Medicinal Chemistry & Pharmacology, University of Illinois, Chicago, USA, said that research in the medicinal application of natural products is a team work and there is far greater need for collaboration amongst the nations for furthering the knowledge of natural products. He further said that social dimension of research in natural products such as benefits to human beings should be decided on basis of the need of the world by social and research networking.

Dr A.V. Rama Rao, CMD, AVRA Laboratories & former Director of IICT, said that globally the drug discovery is slowing down and only 27 new chemical entities were registered during the last year. Now, the time has come to look at the nature for medicinal applications. The availability of new technological tools to understand various medicinal properties of natural products would make the

research easier and beneficial.

Prof. Barry Noller, Chairman of the International Advisory Committee from Australia, said that India was one country that was going to make its presence felt in this area as still traditional and herbal medicines are being practiced in many parts of the country.

Other important speakers included Prof. John

Blunt, University of Canterbury, New Zealand; Dr Muvva Rao, Novartis Pharma, Switzerland; Prof. Eric J. Thomas, University of Manchester, UK; Prof. Rene Gree, CNRS, France; Dr David Y.K. Chen, Agency for Science & Technology & Research, Singapore; Dr Vijay Kumar, University of Peradeniya, Sri Lanka; Prof. Burt Fraser-Reid, Pillboro, USA; Dr Sheo B. Singh, Merck Research Labs, USA; Prof. Jyoti Chattopadhyaya, Uppsala University, Sweden, etc.

Prof. Goverdhan Mehta, former Director, Indian Institute of Science, Bangalore and Chairman, Research Council, IICT, delivered a lecture on "Enhancement and exploration of natural products' diversity".

About 500 delegates from across the Asian subcontinent and Pacific region including Pakistan, Sri Lanka, Myanmar, Nepal, Australia and New Zealand in addition to USA, UK and other European countries participated in the symposium.

IICB and CNMCH organize Conference on Neuroscience

The Indian Institute of Chemical Biology (IICB) and Calcutta National Medical College & Hospital (CNMCH), Kolkata, jointly organized a neuroscience conference, 'Neuro Update 2008', at the Central Glass & Ceramic Research Institute (CGCRI), Jadavpur, Kolkata, during 20-21 September 2008. The unique feature of the conference was that half of the speakers represented clinicians and other half, basic neuroscientists. The hallmark of this conference was bringing together of basic neuroscientists, neurologists and students from both medical and basic sciences as well as patients or the immediate relatives on a common platform for an effective dissemination of knowledge and fruitful discussion on the recent advances in basic and clinical researches on neuroscience.

Dr Surya Kanta Misra, Minister of Health, Panchayat and Rural Development, Government of West Bengal, inaugurated the two-day conference, which consisted of seven sessions, viz. Neuro-aids, Epilepsy, Neurodevelopmental disorders, Neurodegenerative disorders, Drug development and Diagnostics, Drug dependence and Stroke. Each session had two major speakers, one each from the basic science and from the medical field, in the same area of neurological or neuropsychiatry problem of the disease. The session followed by three panelists, who spoke and commented on the two lectures, and the coordinator brought the topics' essentiality into focus. The speakers consisted of eminent neuroscientists, neurologists and psychiatrists from all corners of the country who provided invaluable insight into the latest developments, challenges and requirements in the field of neuroscience. The stress was on how the knowledge gathered at the bench could be brought to the bedside of a suffering patient, and what the neurologists or the psychiatrists would like to have from the basic scientists, and vice versa. The conference also saw the felicitation of three noted



Dr Surya Kanta Misra, Minister of Health, Panchayat and Rural Development, Government of West Bengal, lighting the inaugural lamp



Dr Surya Kanta Misra, Minister of Health, Panchayat and Rural Development, Government of West Bengal, amidst members of the organizing committee (*from left to right*): Dr K. P. Mohanakumar (Organizing Secretary, IICB), Prof. B. C. Mohanty (Chairman, CNMCH), Prof. P. K. Gangopadhyay (General Secretary, CNMCH) and Dr Sumantra Das (Organizing Secretary, IICB)

scientists of Kolkata, namely Prof. J. J. Ghosh, a noted neurochemist and Centenary Professor of Neuroscience of Calcutta University; Prof. K. L. Mukherjee, an eminent teacher and clinical biochemist, retired from Calcutta University; and Prof. Shyamal Sen, a well known doctor of neuromedicine, retired from Calcutta University.



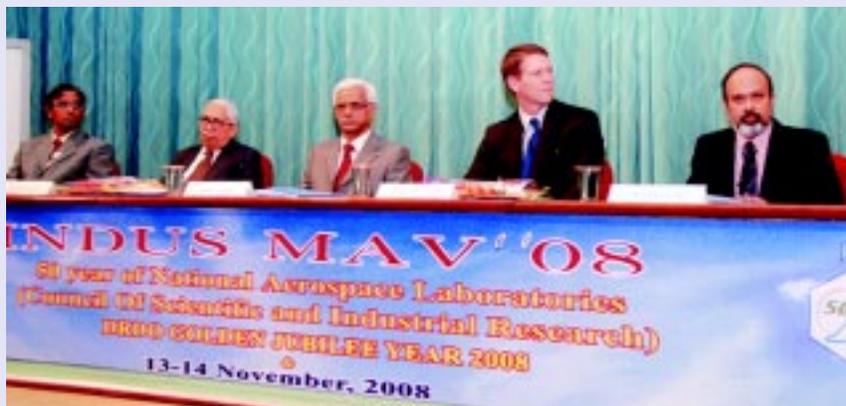
Indo-US Workshop on Micro Air Vehicles (INDUS MAV '08)

As a part of National Aerospace Laboratories (NAL) and DRDO's Golden Jubilee celebrations, a workshop on 'Micro Air Vehicles' was jointly organized by NAL, ADE and AFRL, USA on 13-14 November 2008.

The US team consisting of members from AFRL, AOARD, US Army's RDECOM and MIT was led by Dr Douglas Blake, Deputy Director, AFRL, USA.

The inauguration was held in SR Valluri Auditorium at NAL. Mr Shyam Chetty, Co-ordinator of the workshop, initiated the inaugural proceedings with a brief overview of the objectives of the workshop. The main objective was to identify core technology areas of common interest related to MAV aerodynamics, structures, control, guidance and navigation.

Dr A.R. Upadhyaya, Director, NAL, delivered the welcome address. Mr P.S. Krishnan, Director, ADE, gave a perspective on MAVs and the activities being pursued at ADE. Dr Douglas Blake delivered the inaugural address and also released a souvenir containing the abstracts of the presentations scheduled for the technical sessions. In his address, Dr Blake covered the strategic vision of AFRL and the challenges in development of autonomous system technologies for MAVs. He indicated that by 2015,



A dais view of Indo-US Workshop on Micro Air Vehicles (INDUS MAV '08)

AFRL would be able to demonstrate a biomimetic bird-sized UAV platform with the capability of semi autonomous operations and hoped to design and autonomously fly a bee sized MAV by 2030. The keynote address was delivered by Prof. Dattaguru, IISc, who gave a perspective of R&D activities in the field of MAVs being pursued in different academic institutions in India.

The inaugural session was followed by paper presentations spread over three technical sessions. Lt. Gen. Sundaram presented an overview of the MAV activities in India. Lt. Col. John Seo, Technical Director, AOARD, USA and Mr C.U. Hari, Director, Directorate of Aeronautics, DRDO, New Delhi, presented the role of AOARD and AR&DB in promoting research activities in the area of MAVs. Dr Siva S. Banda from AFRL, and Prof. Jonathan How from MIT then gave interesting talks on the autonomous MAV flight research being carried out in their institutions. The papers presented

in the subsequent technical sessions by scientists from US and India covered a variety of topics dealing with unsteady aerodynamics, flapping wing MAVs, flight dynamics, guidance, navigation and flight control,

smart materials, active flow control techniques and CFD applications for MAVs.

The technical sessions on the second day were held at ADE. The focus this time was on vision-based surveillance, visual sensing and processing for navigation and control and efficient storage of optic flow data for vision sensors. Papers on task allocation, search strategies and consensus mechanisms for MAV swarms and group coordination tactics were also presented. This was followed by round table discussions in the areas of MAV aerodynamics, controls and structures. The final round of discussions at the workshop focussed on exchange of ideas and arrive at a roadmap for future joint collaborative research in this strategic area with special emphasis on autonomous flapping wing and bio-inspired flight.

More than 150 delegates from various R&D organizations, private industry and academic institutions in India participated in the workshop.

Workshop on Herbarium Techniques

The National Institute of Science Communication And Information Resources (NISCAIR), New Delhi, conducted a six-day workshop on herbarium techniques during 20-25 October 2008. The workshop was aimed at imparting current knowledge on scientific methods of plant collection, preservation, identification, nomenclature, techniques for creation of herbarium database, documentation of information on plants, management of herbaria, etc. to the participants and to make them aware of the latest developments related to the herbarium techniques. It was targeted to herbarium curators, bioscience teachers of schools, college/university lecturers, scientists from research institutions, research scholars and students and those who were interested in setting up a regional herbaria. Eighteen participants from India, Pakistan and Nepal attended the workshop.

The workshop was divided into



Seen on dais (from left) are : Dr Narendra Kumar, In-charge, NISCAIR Training Programmes; Shri S. K . Rastogi, the then Acting Director, NISCAIR, and Dr H.B.Singh, Co-ordinator of the workshop on Herbarium Techniques

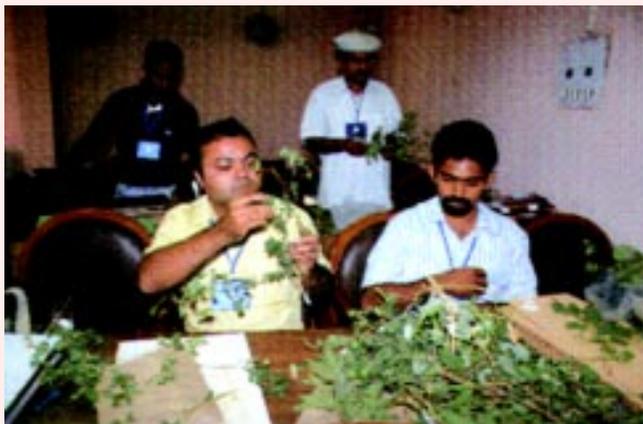
four modules: Herbarium techniques comprising collection and preservation of plant materials and practical exercise including field trip for collection of plant specimens; processing of mycological specimens and preservation of plant genetic resources; techniques of plant identification, nomenclature and creation of herbarium databases;

and the role of herbaria in research, education and conservation of biodiversity.

Dr B. Subramaniam, Scientist, NISCAIR, gave a presentation on 'Herbarium and Its Functions'. He explained that herbaria are scientific tools for establishing correct botanical identity and nomenclature of plants, and housing plant



Participants collecting plants during field collection trip



Hands-on exercise on processing of specimens

specimens in a recognized system of classification. Herbarium collections serve as the basis for our understanding of biodiversity. As a basic resource for the study of systematic botany and related fields, herbarium serves as a reference centre, a documentation facility and data storehouse. Dr H.B. Singh discussed the materials and equipment required during the collection of plant specimens and for developing a new herbarium. Dr Singh also demonstrated various steps and techniques involved in plant processing such as plant pressing, drying, poisoning, mounting, stitching, labelling, sorting, accessioning, indexing and incorporating of herbarium sheets in cupboards. He also threw light on physical and biological agents responsible for deterioration of herbarium specimens and how different methods are used for preservation of plant specimens in the field as well as in herbarium.

The participants were given hands-on exercise for processing of specimens like mounting, stitching and labelling.

Dr D.K. Agarwal, former Head,

Mycology Herbarium, enlightened the participants regarding recent techniques used for collection and preservation of fungi and diseased plant specimens and maintenance of culture collections.

A visit to the Herbarium "*Cryptogamae Indiae Orientalis*" (HCIO) at Indian Agricultural Research Institute (IARI), New Delhi, was arranged.

Dr E. R. Nayar, Head, Exploration Division, National Bureau of Plant Genetic Resources (NBPGR), gave an overview of the significance of Herbarium in preservation of wild germplasm of cultivated plants and their wild relatives and emphasized on the utility of wild species in genetic upgradation of crop species. A visit to the 'National Herbarium of Cultivated Plants' (NHCP), National Gene Bank and National Cryogen Bank of NBPGR enabled the participants to understand the current techniques of preservation and maintenance of genetic resources of the country.

Dr M. P. Sharma, Professor of Botany, Jamia Hamdard University, New Delhi, gave an elaborate talk

on plant nomenclature. He explained the rules and regulations of the International Code of Botanical Nomenclature (ICBN) by which name of a taxon is determined.

Shri S.K. Burde, Scientist, NISCAIR, made the participants aware of the methods of creating herbarium database. He threw light on the different softwares required for creating herbarium database.

Dr B. Subramaniam in his lecture on plant identification described the methods of plant identification in detail and the role of 'identification keys' in the identification of plants. He demonstrated online databases related to plant identification using vegetative characters of the plants. He also conducted a hand-on exercise on plant identification.

Dr P.L. Uniyal, Reader, Department of Botany, Delhi University, gave a talk on 'Role of Herbaria in Conservation of Biodiversity and Protection of Environment'. He was of the opinion that herbarium is a centre of knowledge resource that can be used for deciding primary centre of origin

of genetic resources. He further elaborated importance of herbaria to serve as a means of locating hotspots, endemism, rare or possibly extinct species via recollecting areas listed on label data (conservation biology, environmental impact statements, endangered species, etc.). He pointed out that herbarium could be used to detect evolutionary changes in the time and space by DNA extraction and fingerprinting methods.

Dr R.D. Gaur, former Head, Department of Botany and Dean, Faculty of Science, H.N. Bahuguna University, Srinagar, Garhwal, described the role of herbaria in the study of ethnobotany. He pointed out that the scrutiny of passport data written on herbarium labels is one of the recognized methods for the study of ethnobotany.

A field trip for collection of plant specimens was made in and around Buddha Jayanti Park area of New Delhi Ridge. A visit to the "Botanical Garden of Indian Republics (BGIR)", NOIDA, was also organized.

The technical lecture session concluded with a lecture by Dr H.B. Singh, Coordinator of the workshop, on 'Management of Herbaria'. A CD on Herbarium Techniques, prepared by Raw Materials Herbarium & Museum (RHMD) of NISCAIR, was also played.

In their feedback, the participants expressed that the workshop was very informative, well planned and rich in content. Certificates and CDs on Herbarium Techniques were given to the participants by Shri S.K. Rastogi, the then Acting Director, NISCAIR. He also released a book entitled "Field Manual on Herbarium Techniques".

The workshop ended with a vote of thanks proposed by Dr H. B. Singh.

CSIO celebrates Foundation Day

"Measurement Sciences and Instrument Technology are the key components in almost all engineering applications of manufacturing sector and CSIO by virtue of its strength can meet the targets," remarked Shri Kapil Sibal, Minister for Science & Technology and Earth Sciences, and Vice President, CSIR, while addressing the distinguished gathering on the occasion of 49th Foundation Day of the Central Scientific Instruments Organisation (CSIO), Chandigarh. Shri Sibal stressed the need of cloning more CSIO's to cater to the needs of the Agro-based Sector and emphasized that more attention should be given to the development of technologies, which change the quality of life of 800 million people. He said that science & technology are the two sides of a coin and they have to work hand in hand with complete synergy. He complemented Dr Pawan Kapur, Director, CSIO, for the efforts and dedicated work done on Head Up Display which has placed India in the forefront of technologies pertaining to the strategic sector.

Earlier, welcoming the Chief Guest, Dr Pawan Kapur, Director, CSIO, informed about the various on-going programmes of his institute and its achievements of the past year. He also mentioned about the new programmes on Agrionics and Biomedical instrumentation in a network mode, and the proposal for advanced courses on Agrionics and Lightwave Engineering.

A workshop on Avionics Display and Optical Metrology (ADOM-2008) was also inaugurated by the Minister. This workshop was organized by CSIO jointly with Regional Centre for Military Airworthiness (RCMA), Chandigarh; Bharat Electronics Limited (BEL), Panchkula; and Aeronautical Society of India (Chandigarh Branch) on 30-31 October 2008. The workshop aimed at providing a common platform to scientists, engineers, researchers and industrialists to discuss and deliberate on the various important issues related to the emerging technologies of Cockpit Display Instrumentation and Optical Metrology.

Shri Sibal also released the Annual Report of CSIO and the souvenir of the ADOM-2008.

Later during the video conferencing, CSIR Director General Prof. Samir K. Brahmachari congratulated CSIO on its 49th Foundation Day and HUD achievement. Prof. Brahmachari said that there are many more miles to cover so that the dream of every aircraft having CSIO HUD could be realized.

The programme concluded with a formal vote of thanks by Shri A.K. Dimri, Scientist, CSIO.



CPYLS at CSIO

The Central Scientific Instruments Organisation (CSIO), Chandigarh, organized the two-day CSIR Programme on Youth Leadership in Science (CPYLS) on 5-6 November 2008. About 70 persons comprising students and their parents/teachers, from different schools of Haryana, participated in the programme.

During the programme, the participants were apprised of the scenario of Science & Technology in the country and the various activities undertaken at CSIO. Popular science lectures by CSIO scientists, multimedia science quiz competition and creativity session were organized to inspire and motivate them to develop a scientific

temper. The participants had an opportunity to see some science models and get information about CSIO programmes while interacting, with the Scientists/Technologists, during visit to various CSIO labs, including the Indo-Swiss Training Centre (ISTC).

During the valedictory session, Prof. K.R. Sarma, Advisor, Technology, SAMTEL Group of Industries and former Director of CSIO, was the Chief Guest. Addressing the students, Prof. Sarma mentioned that science is an exciting journey and it makes us learn about the unknown. Although a lot of efforts have been made by man to unravel the mysteries of nature, environment, planet earth,

etc. still there is lot more to know in this direction. Advances are being made almost every day, he mentioned. He talked about some areas on the scientific horizon like energy, alternative sources of energy for organic photo-voltaic for tapping solar energy, MEMs and their use in aircraft, automobiles, clinical and biotechnology research, etc. He also discussed the development of instruments to find ground water level depletion. He mentioned that the journey of science is full of challenges but very exciting and satisfying. He exhorted the students to join the science stream to unravel these mysteries and to gain knowledge so as to reduce our ignorance. The participants were

awarded the certificates, medals and mementos.

Director, CSIO, while welcoming the Chief Guest said that CSIO enjoyed interacting with the young students in the last two days and advised the students to be in touch with CSIO for any further guidance.

Shri R.C. Arora, Co-ordinator of this programme presented the highlights of this event and



CPYLS at CSIO, seen clockwise (from top left): Prof. K.R. Sarma interacting with participants; Shri V.P.S. Kalsi (T.O.) (left), Dr Pawan Kapur, Director, CSIO, and Shri R.C. Arora, Co-ordinator CPYLS, evaluating the entries of Creativity Competition, and one of the participants giving her feedback

mentioned the salient features of the CPYLS scheme. The participants assured to make the optimum use of the knowledge gained through this

programme. They expressed that this programme has helped them in broadening their outlook and now they have the courage to look and

think beyond books also.

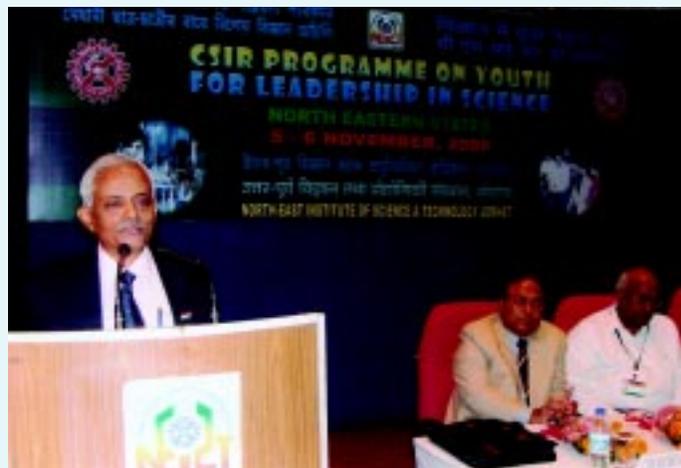
Shri M.R. Masan, Controller of Administration, proposed the vote of thanks.

CPYLS at NEIST

The North East Institute of Science & Technology (NEIST), Jorhat, organized a two-day CSIR Programme for Youth Leadership in Science (CPYLS) on 5 and 6 November 2008. Thirty-three students along with their escorts and parents from different schools of north east states participated in the programme. Dr W. Selvamurthy, Chief Controller, R&D, DRDO, New Delhi, was the Chief Guest and Dr R.B. Srivastava, Director, DRL, Tezpur and Dr B.V. Rao, Director, IIT Academy, Kota, were the Guests of Honour.

Dr P.G. Rao, Director, NEIST, in his welcome address briefly spoke about the programme and appealed to the young students to imbibe scientific spirit in them. Delivering his speech on 'Science Profession— A Learning, Earning and Serving Career' Dr Selvamurthy mentioned that the new discoveries in chemical and biological sciences, engineering sciences, aeronautical sciences, drug development, medical sciences, etc. could make India one of the major economic powers in the world. He particularly highlighted the achievements of the nation in Air Force weapons, missiles, tanks, naval aircraft carriers, atomic weapons, etc. He also spoke on weaponisation, biomedical facilities, automobile development, space missions, acclimatization programmes for soldiers in high altitude snowline areas, etc. He also mentioned the career opportunities in Indian Armed Force, Naval Force and Air Force and various research activities going on in DRDO. Dr Srivastava exhorted the students to treat science with passion and take up Science and Technology as a career.

The programme comprised popular science lectures by eminent scientists, interactions with scientists, visit to NEIST laboratories, cultural programme, semi-extempore speech competition and practical training. Eleven students were selected on merit basis and given the opportunity to visit two CSIR labs of their choice in future.



Dr W. Selvamurthy, Chief Controller, R&D, DRDO, delivering his speech at the inauguration of CPYLS. Others seated on the dais (from left) are: Dr R.B. Srivastava, Director, DRL, Tezpur and Dr P.G. Rao, Director, NEIST

IJMS selected as a Companion Journal of ISIUS-2009

The *Indian Journal of Marine Sciences* (IJMS) published at the National Institute of Science Communication and Information Resources (NISCAIR), New Delhi, has been selected as Companion Journal of the International Symposium on Intelligent Unmanned System 2009. This symposium will be held at Juju, South Korea, during 3-5 June 2009. The other companion journals are *Chinese Science Bulletin* and *Journal of Bionic Engineering*.

The organizing committee has also invited the Editor, IJMS, Dr J. Sundaresan Pillai, to give a keynote speech at the symposium.



Dr R.K. Chadha of NGRI conferred 2008 Decennial Award of IGU



Dr R.K. Chadha, Scientist F, National Geophysical Research Institute (NGRI), Hyderabad, has been conferred the 2008 Decennial Award of the Indian Geophysical Union (IGU) at the 45th Convention of the IGU at Banaras Hindu University, Varanasi on 5 November 2008.

Dr Chadha has been given this award for his outstanding contributions to the area of broadband seismology. His initiative to understand the Indian shield seismicity and structure has broken new ground in constraining the Lithospheric-Asthenospheric Boundary (LAB) below the Indian Plate. This has resulted in providing a convincing explanation to a global geodynamical problem of the rapid drift of Indian Tectonic plate vis-à-vis the Australian and African plates, during Cretaceous times. These

Prof S.K. Brahmachari awarded Jagadis Chandra Bose Medal (2007)

Prof. Samir Kumar Brahmachari, Director General, CSIR, has been awarded The Jagadis Chandra Bose Medal of the Indian National Science Academy (INSA), New Delhi, for the year 2007. The award has been given to him for establishing leadership in functional genomics effectively integrating experimental and computational approaches.

Established in 1976 by INSA, this award is given once in three years for outstanding contributions in Biochemistry, Biophysics, Molecular Biology and related areas impact of which has been felt for a considerable length of time.

The award was presented to Prof. Brahmachari, after the Award-lecture on 11 January 2009 at INSA, New Delhi.



results were published in *Nature* in 2007. Another major contribution by him is the first estimates of Tsunami Run-ups heights, which he provided immediately after the December 2004 tsunami. These results have led to the development of thousand of scenarios for inundation of Indian coastal areas for different earthquake sources along the Andaman & Nicobar island and Sunda trench.

Dr Chadha has earlier received the National Mineral Award in Geophysics in 2003 and became Fellow of the Andhra Pradesh Academy of Sciences in 2008 and the Fellow of the Indian Geophysical Union in 2007. He is presently

holding several prestigious international positions e.g. he is President of the International Natural Hazard Society. Recently he has been re-elected as the Secretary-General of the Asian Seismological Commission for four years (2008-2012). The elections were held in Japan during the 7th General Assembly of the Asian Seismological Commission and the Seismological Society of Japan during 25-27 November 2008.

Dr Chadha is presently heading the Seismology Group at NGRI. He has published over 52 research papers in the international and national SCI Journals and has been a Guest Editor for four professional scientific journals.