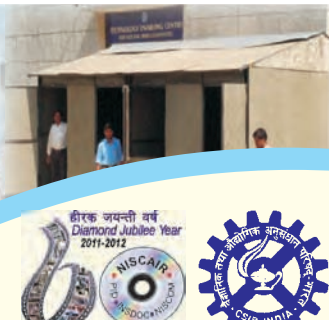




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OPEN SOURCE
DRUG DISCOVERY
FOUNDATION

CSIR NEWS

Progress, Promise and Prospects

"When it comes to health, we need to have a balanced view between health as a right and health as a business"

Prof. Samir K. Brahmachari
Chief Mentor OSDD
Director General, CSIR

VOL 62 NO 9 & 10 MAY 2012

C O N T E N T S



IMTECH Organizes OSCAT 2012

National Get-together on Road Research and its Utilization at CRR



Leather Research Industry Get-Together



CIMAP Imparts Training to Women on Agarbatti-making Technique



National Science Day Celebrations in CSIR Laboratories



website: <http://www.csir.res.in>





CONFERENCES

IMTECH Organizes OSCAT 2012 Opening New Vistas to Discover Biomedical Therapies of Tomorrow

A collaborative and open source approach to discovering and sharing knowledge for achieving affordable healthcare for all is the need of the hour. This was the theme of the second international conference on *Open Source Drug Discovery for Computer-Aided Translational Medicine (OSCAT)* organized by the CSIR-Institute of Microbial Technology (IMTECH), Chandigarh, India, during 22-25 February 2012, under the aegis of Open Source Drug Discovery (CSIR-OSDD) and the leadership of Dr. G.P.S. Raghava, Scientist and Head of Bioinformatics Centre, IMTECH.



DG-CSIR emphasized the need for applying the open source model for the healthcare sector

two hundred participants, including eminent scientists from the frontiers of computational biology and therapeutics research, academicians and students, across the nation and abroad.

The event got a headstart with the inaugural lecture by India's Open Source guru and Director General, CSIR, Prof. Samir Kumar Brahmachari, who talked about how Open Source Drug Discovery (OSDD), based on the concept of

crowdsourcing, is emerging as the new paradigm for distributed co-creation. Prof. Brahmachari elaborated on the OSDD approach towards the development of systems biology platform

for its first target – Tuberculosis – in order to discover new drugs, targets and potential lead molecules.

The *Open Source* model has found extensive application and global reception in the field of information technology, as in the case of Linux operating system, World Wide Web (WWW) and the Apache Software Foundation. In the field of life sciences, the Human Genome Project exemplified the realization of innovations through open source collaborative channels. Prof. Brahmachari emphasized the need of applying the same philosophy to the healthcare sector, where information sharing through web-based platforms will reduce the time involved in drug discovery and also enable delivery of high quality drugs in resource-limited settings.

Dr. Bernard Munos, founder of InnoThink Centre for Research in Biomedical Innovation, Indianapolis,

Eminent speakers on the occasion



Dr. Bernard Munos



Dr. Christoph Steinbeck



Dr. David Wild



Dr. Andrew Lynn



Dr. Geoff Barton



Dr. Adrie J.C. Steyn



Dr. S. Ramachandran



Mr. Michael Y. Galperin



Dr. Georg Sczakiel



Dr. Stephen Bryant



CONFERENCES

USA, affirmed Prof. Brahmachari's view, expressing concern over the increasing cost of drug discovery, despite the availability of high-throughput data and technological advancements. Calling attention to the view that pharmaceuticals is an industry poised for disruption owing to lack of innovation and other issues, Dr. Munos remarked that therapeutics developed in open source mode provides an opportunity for creative disruption of stagnant pharmaceutical industry.

Dr. Munos stated that open source is the only viable alternative, providing flexible, innovative and economical model for drug discovery. According to Dr. Munos, the three major hubs for breakthrough innovation would be National Institute of Health (NIH) in US, World Health Organisation (WHO) efforts in Africa, and Central Council of Scientific and Industrial Research (CSIR) in India.

Together, the two narratives laid the foundation for extensive deliberations and interactions in this four-day conference. This was followed by short presentations by invited speakers, which included

dignitaries like Dr. Joel Sussman, Dr. Stephen H. Bryant, Dr. Christop Steinbeck, Dr. Ena Wang, Dr. Robert Glen, Dr. J.G Frey, Dr. David J. Wild, Dr. Andris J. C. Steyn, Dr. Geoff Barton, Dr. Michael Galperin, Dr. Georg Sczakiel, Dr. T.S. Balganes, Dr. Dinkar Salunke, Dr. Sourav Pal and others.

The sessions included diverse topics from emerging areas of science such as computational biology and web services for translational medicine, therapeutic challenges in tuberculosis, *in silico* identification of drug targets and application of novel computational tools in disease diagnosis, drug development and healthcare, bio-therapeutics, computer-aided therapeutics, and bioinformatics.

The major highlight of the event was the session on OSDD that included presentations by the Principal Investigators of the CSIR-OSDD project, working in the forefront of tuberculosis research. The speakers presented an overview of the structuring, workflow, achievements and challenges faced by the

consortium while collaborating in an open source mode.

Mr. Zakir Thomas, Project Director, OSDD, apprised the audience about the uniqueness of the model in not only combining the strengths of chemists, the insights of biologists and the skills of bioinformaticians on a common platform, but also in supporting public private partnerships (PPP), so as to significantly reduce the overall cost of drug discovery.

Dr. Anshu Bhardwaj spoke on the significance of adopting a system level approach for generating the interactome and metabolic map of *Mycobacterium tuberculosis (Mtb)* to define the drug target space for Mtb. She also presented a large pool of resources ranging from databases to web services developed by the OSDD Community.

Dr. S. Ramachandran, briefed the delegates about the protocols and results for computational screening of *Mtb* inhibitors against a given target. Under the community-driven efforts of OSDD, the integration and extrapolation of this computational data has been done to wet

Eminent speakers on the occasion



Dr. U.C.A. Jaleel



Dr. Joel L. Sussman



Dr. Anshu Bhardwaj



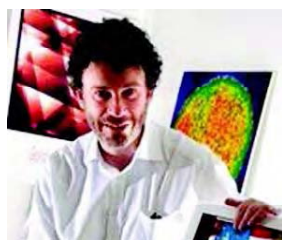
Dr. Robert Glen



Dr. Dinakar M. Salunke



Dr. Ena Wang



Dr. Jeremy Frey



Dr. T.S. Balganes



Dr. Zakir Thomas



Dr. Sourav Pal



Dr. Haridas B. Rode



CONFERENCES/MoUs

lab experiments.

Dr. Haridas Rode pointed out that while identification and synthesis of new chemical entities (NCEs) has always been a closed-door phenomenon, the configuration and innovative policies of OSDD allowed the synthesis, deposition, and sharing of chemical compounds through OSDDChem portal.

Dr. Wild, OSDD collaborator from Indiana University, USA, specializing in cheminformatics and semantic networks, also joined the event through Skype to discuss the salient features and significance of the chemical biology data resource, Chem2Bio2RDF, in simplifying the process of drug-target identification.

Dr. Raghava enlightened the audience about OSDD's CRDD portal, a freely accessible comprehensive portal on resources for drug discovery. Further, Dr.

Andrew Lynn and Dr. U.C.A Jaleel elaborated on the use of grid computing by OSDD to meet computational barricades, and discussed the success and challenges of online research, respectively.

The conference had an overwhelming participation by enthusiastic students and young research scholars throughout who also presented their novel ideas and research through posters and oral presentations.

As the curtains fell on the conference, the participants bid adieu with the promise of upholding the principles of Open Science and fulfilling the commitment of providing affordable healthcare to the poorest of the poor. When asked to comment upon the outcomes of the conference, most delegates remarked that while India is definitely steering the world towards

scientific innovation, what is required is propagation of this insight across the world.

It is incidental, that while CSIR-IMTECH was witnessing so much action in the frontiers of interdisciplinary research, *Science* magazine gave an explicit coverage to OSDD's efforts in making India a powerhouse of scientific research, under the leadership of Prof. Brahmachari, in its article titled *India Rising*.

The conference indeed was an eye-opener with regard to research in an open source model, as evident from the upsurge in registrations on OSDD portal *Sysborg 2.0* from researchers across the globe. OSCAT-2012 is likely to be instrumental in fostering more productive collaborations and infusing much-awaited innovation to the process of drug discovery in the times to come.

CSIR-CBRI signs MoU with DTRL

CSIR-CBRI has joined hands with the Defence Terrain Research Laboratory (DTRL), a Defence Research & Development Organization (DRDO) establishment in New Delhi, for the development of Landslide Early Warning System in the Garhwal Himalaya. Prof. S.K. Bhattacharyya, Director CSIR-CBRI and Mr. G.S. Malik, Director, DTRL, along with Project Investigators Mr. Y. Pandey (CSIR-CBRI) and Mr. Sunil Dhar (DTRL) signed the Memorandum of Understanding (MOU) on 15 November 2011 at CBRI, Roorkee.

CSIR-CBRI has been involved in landslide studies since the last two-and-a-half decades in various Himalayan states with the financial support of DST, MoEF, BRO, DTRL and state PWDs. This will be an extension of the collaboration between the premier institutions of the

country, which started in 2001 with the study of three strategic landslides in Sikkim. Tangni landslide on Chamoli Joshimath road near Garudganga has been selected as the project site by both the institutions.

An instrumental study will be undertaken to arrive at a rainfall trigger threshold for initiation of landslides in this region. Real-time monitoring instruments like piezometer, inclinometer, wire extensometer and automatic rain-gauge will be deployed for site-specific data collection. A suitable algorithm will be developed by the



The MoU being signed at CSIR-CBRI

team so that the data received at remote stations will be utilized to issue multi-level alarms for the benefit of the civil administration as well as the general people. The project duration will be three years with a project budget of Rs. 45.50 lakh.



MoUs/GET-TOGETHER

CSIR-CBRI signs MoU with UTU

Recognizing the importance of research and development and the need for qualified manpower in building science and technology, CSIR-CBRI signed an MoU with the Uttarakhand Technical University (UTU) on 9 December 2011. The Memorandum was signed by Prof. S.K. Bhattacharyya, Director, on behalf of CSIR-CBRI, Roorkee and Prof. D.S. Chauhan, V.C., UTU, Dehradun.

The MoU details the modalities and general conditions regarding collaboration between CSIR-CBRI and UTU for enhancing the availability of highly qualified manpower in the area of building science and technology without any prejudice to prevailing rules and regulations in CSIR-CBRI and UTU and without any disregard to the mechanism evolved and approved by the competent authorities under Govt. of India.

The areas of cooperation can be extended through mutual consent. The MoU shall remain effective for a period of five years.



The MoU being signed at Dehradun

National Get-together on Road Research and its Utilization at CSIR-CRRI

CSIR-Central Road Research Institute (CRRI) organised a National Get-Together on Road Research and its Utilization (NGT-2012) at its premises on 1-2 March 2012. The goal of NGT-2012 was to provide an appropriate forum to the highway engineering fraternity – researchers, experts, academicians, consultancy and contracting firms, manufacturers of materials and equipment associated with road development in the country. The main purpose was to hold deliberations on emerging issues related to roads and road transportation for ensuring sustainable development of infrastructure in the country. The get-together was sponsored by fifteen organizations and was attended by more than four hundred delegates from DDA, MoRTH, NHAI, State PWDs, and various R&D and academic institutions.

The get-together was inaugurated by Shri C. Kandasamy, Director-General (RD), MoRTH, while Lt. Gen. R. Ravi

Shankar, PVSM, VSM, DG (BRO) was the Guest of Honour.

Extending a warm welcome to the dignitaries and delegates, Dr. S. Gangopadhyay mentioned that NGT-2012 was being organized to provide a forum for interaction between road researchers and user agencies including in-depth discussions on various measures for increased utilization of the R&D funding available. He highlighted that Energy and Environment issues in road development activities and relevant policies therein would play a key role in the years to come. Hence, appropriate technological advancements and innovations in the areas of road building materials and economical designs are essential to achieve sustainable development and to conserve scarce natural resources. The need for undertaking R&D studies for improving road safety, integration of different modes of transport in order to promote public

transport and to provide efficient, effective and economical transportation solutions was also highlighted.

Shri C. Kandasamy, Director-General (RD), MoRTH, emphasised the future transportation needs of the country and highlighted the problem of congestion in urban environments. He stressed the need to use locally available materials, adoption of stabilization techniques and different aspects to be considered while planning and designing new expressways and highways.

Lt. Gen. R. Ravi Shankar, PVSM, VSM, DG (BRO), stressed the need to develop appropriate technologies for use of local inferior materials, adoption of soil stabilization techniques and materials resource crunch in border areas of the country.

Shri T.K. Amla, Organizing Secretary, NGT, read the messages of good wishes received from VIPs for the success of NGT-2012. Shri Sudhir Mathur, Head,



GET-TOGETHER

Geotechnical Division proposed the vote of thanks.

During the get-together, a technical exhibition was also organised in which about thirty-two organisations including CRII displayed their products. On this occasion, a souvenir containing messages of good wishes from dignitaries and papers of general interest was released by Shri C. Kandasamy.

The two-day meet comprised seven technical sessions that included panel discussions and presentations on important themes. The interactions resulted in a number of priority R&D areas pertaining to roads and road transportation being identified, and which need to be undertaken in the country, such as:

I Pavement Engineering & Materials

- Need for developing comprehensive methods for design and rehabilitation of pavements.
- Preparation of specifications and standards suitable for DBFO, EPC and PPP contracts.
- Development of Pavement Management System (PMS).
- Use of Accelerated Pavement Testing Facility (APTF) to study ageing and long term performance of pavements.
- Cement treated bases and sub-bases with crack arresting layer for use in bituminous pavements.
- Thin overlay of polyester polymer concrete (as the wearing course) on bridge decks and CC roads.
- New materials and techniques such as Stone Matrix Asphalt (SMA), Warm Mix Asphalt (WMA), Microsurfacing, Reclaimed Asphalt Pavement (RAP) and High Volume Fly ash Concrete.
- Concrete overlays with thin and ultra thin white topping.

II Bridge Engineering

- Need for up-gradation of Indian codes.
- Adoption of Limit state method for design of bridges (for all codes).
- Assessment of load carrying capacity for prediction of service life.
- Fast track construction of bridges by using corrugated steel plate structures.
- Use of stainless steel for long-term durability of bridges.
- Use of wireless technology for structural health monitoring.
- Under water inspection of bridge components.
- Development of accelerated methods for evaluation and repair of bridges.

(c) Assessment of glacier movements

(d) Risk assessment, analysis and crisis management.

- Importance of slope maintenance and adequate drainage system for landslide mitigation.
- Feasibility of tunnel construction as long-term solution for landslide mitigation.
- Use of flexible systems/structures (reinforced earth wall, gabion walls, soil nailing, barriers, rope mesh etc.) for landslide mitigation and rock fall control.
- Database management system for landslides.
- Early warning systems for landslides.

III Hill Roads and Landslide Mitigation

- Application of Remote Sensing and Geographical Information System (GIS) for
 - (a) Landslide hazard zonation mapping
 - (b) Liquefaction mapping

IV Urban Transportation

- Overview of travel demand and supply trends in India and gaps in public transport.
- Strategies for increasing bus patronage by deploying ordinary and special services.
- Assessment of appropriate



Glimpses of NGT-2012





GET-TOGETHER

- technology/system for use of public transport in different cities.
- Considerations of various aspects while planning for public transportation system such as, user's behaviour and qualitative aspects, public transport priority, IT in public transport, facility and transfer station planning, feeder system etc.
- Negative impact of decentralization of economic activities within urban areas.
- Strategies for improvement of urban transportation viz. public transport improvements; avoiding gigantism; strengthening research and implementation.
- Transportation planning process with due consideration to sustainable development.
- Design of transportation facility for a period of 25 to 50 years.

V Road Safety and Environmental Issues

- Necessity to provide Non-motorised Transport/Vulnerable Road Users

- (NMT/VRU) facilities to reduce road accidents.
- Critical evaluation of visibility parameters for reduction of accidents.
- Need for undertaking mission mode project(s) to eradicate accidents.
- Comprehensive training to heavy vehicle drivers before issuing driving license to them by an independent authority/institution.
- Implementation of road safety audit reports and improvement of black spots in a time bound manner.
- Travel demand management measures to reduce vehicular pollution.

VI Industrial Presentations

- Use of stabilisers and new chemicals (other than conventional, cement & lime) for soil stabilization and utilisation by new testing devices/equipments, as given below:
 - (a) RBI Grade 81 (Powder)
 - (b) Terra tech soil stabilization (Polymer Liquid Stabilizer)

- (c) Fibre reinforced concrete for CC roads
- (d) Asphalt mixture performance testing
- (e) Moisture induced stress tester
- (f) Advanced testing equipments
- (g) Road safety by applying retro reflective technology and enhanced use of road furniture like signage, median marker, delineator etc.
- (h) Latest developments in measuring the condition of pavement surface.
- (i) Automatic detection and analysis of surface distress using multifunctional vehicle.

VII Way Forward

- Need to develop appropriate framework and policies to implement PPP projects.
- Encourage private investment by providing financial support, long-term debt policies.
- Research activities and new technologies to be initiated, developed and imported for implementation in the country.
- Thrust on road safety audit, asset management and sustainable road development.
- Compile research report(s) from India and other developed/developing countries on different thrust areas of research, so as to avoid repetition in research activities and to develop guidelines suited to local environment and traffic conditions.
- Formulate dedicated road safety programmes to avoid accidents.
- Develop policies, strategies and training programmes for proper implementation of road safety audits.



Glimpses of NGT-2012





GET-TOGETHER

Leather Research Industry Get-Together (LERIG) 2012 at CSIR-CLRI

CSIR-Central Leather Research Institute (CLRI) in association with Council for Leather Exports organised the 46th Leather Research Industry Get-together (LERIG) at CSIR-CLRI from 27-29 January 2012. LERIG 2012 evoked an overwhelming response from the members of the Indian leather sector, various trade bodies and institutions involved in the leather arena.

Dr A.B. Mandal, Director, CSIR-CLRI in his introductory remarks stressed on the importance of LERIG 2012. The goal of the event was to deliberate on the CSIR-CLRI's Technology preparedness and bring out a road map for the Leather Industry to traverse in the 12th Plan period. Shri P.R. Aqeel Ahmed, Chairman (Southern Region), Council for Leather Exports spoke on the relevance of technology to meet the current needs of the industry and said that LERIG 2012 was the ideal platform to feature presentations from academy, research and industry.



Dr A.B. Mandal, Director, CSIR-CLRI delivering the Inaugural Address

Two memorial lectures were held on 27 January 2012, chaired by Dr G. Thyagarajan, Former Director, CSIR-CLRI. The *Prof. B.M. Das Memorial Lecture* was delivered by Dr Dietrich Kobschull, Chairman of the IGEP Foundation. Dr Kobschull spoke on *Emerging Challenges for the Indian*



Important dignitaries at LERIG-2012

Leather Industry: A Global Perspective, where he enumerated the macroeconomic challenges for the leather industry vis-à-vis the Global Leather Trade and outlined the steps that need to be taken to overcome these challenges.

Dr Baldev Raj, President, INAE delivered the *Prof. Y. Nayudamma Memorial Lecture*. Dr Raj made a presentation on *Ethics, Energy and Equity*, where he stressed that adequate energy, clean environment, nutritious food, clean water, comfortable home, security in terms of law and order, freedom of speech and actions, opportunities for realizing objectives of life commensurate with individual capability, robust gross domestic product of the country, etc. are the indices of a good nation.

LERIG 2012 was inaugurated on 28 January 2012 by Dr. K. Rosaiah, His Excellency, Governor of Tamil Nadu. In his welcome address, Prof. Mandal, Director, CSIR-CLRI welcomed the distinguished Guests of Honour and the attendees at the Inaugural function. Dr Mandal emphasized that CSIR-CLRI was overwhelmed by the spontaneous support from the Industry in not only shaping the agenda for LERIG 2012 but for also

actively helping in the conduct of the event.

Dr K.V. Raghavan, Chairman, Research Council, CSIR-CLRI spoke about the close industry-institution links and highlighted some of the milestones of CSIR-CLRI in the areas of Fashion Forecasting through the MODEUROP initiative, Zero Liquid Discharge (ZLD) and modernization of the CAD Centre for footwear applications. He spoke about incentivizing Clean Technology programmes through R&D-Government-Industry synergy and advocated the setting up of Clean Technology Missions for transforming laboratory innovations into commercial technologies.

Shri M. Mohamed Hashim a doyen of the Indian Leather Industry, spoke about his association with CSIR-CLRI and especially with LERIG, which discussed and debated on many issues of relevance and benefit to the Indian Leather Sector. He touched upon the environmental issues being tackled so effectively by the industry in Tamil Nadu with the active support of CSIR-CLRI. He also spoke on the need for formulation of clean technology initiatives for the leather sector through brainstorming with industry on priority areas.



GET-TOGETHER/WORKSHOPS

Shri M. Rafeeqe Ahmed, Chairman, Council for Leather Exports said that the leather industry had grown by 27% despite recessionary trends and the Eurozone crisis. He said that India had great opportunity to be the most preferred sourcing destination but it had to augment its capacities. He complimented the Government of India for setting up the mega leather clusters that would help build up capacities.

Shri Rafeeqe Ahmed lauded the efforts of Shri P.R. Aqeel Ahmed, Chairman (Southern Region), Council for Leather Exports for his initiatives in setting

up *Greenfield* production centres in Tamil Nadu. He also informed that CLE was establishing a Sector Skill Council in collaboration with the National Skill development Council under the leadership of Shri Habib Hussain. Shri Rafeeqe Ahmed congratulated CSIR-CLRI for all the technical help rendered to the industry especially the alternative strategies it devised for pollution control.

The sessions of LERIG 2012 deliberated on the issues to be addressed to evolve a strategic Industry-Institution network for planning forward in the Twelfth Plan period. The themes of the

sessions included: Leather Technology and Environment, Leather Creativity & Design Innovation and HRD for Change and Innovation. They were well attended and sites of intellectual ferment and planning.

The thanksgiving ceremony was the grand finale of LERIG 2012. Important dignitaries were graciously honoured with floral bouquets and a memento. The function was marked by an emotionally uplifting spirit of camaraderie and bonhomie. Balloons were then released by the dignitaries present as well as team ITPO welcoming the 27th India International Leather Fair (IILF) 2012.

One day Workshop on *Industrial Perspectives in Bioinformatics at CSIR-IICT*

A one-day workshop on *Industrial Perspectives in Bioinformatics* was organised on 2 March 2012 at the CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad for the tenth batch students of the ongoing 'Advanced Course in Bioinformatics' jointly organized by IICT, CDAC and JNTU. The main aim of conducting the workshop was to enlighten the students on the importance of the subject and the role that bioinformatics plays in the industrial field.

The workshop started with the welcome address by Dr. J.S. Yadav, FNA, FTWAS, Director, IICT. The theme of the workshop was presented by Prof. U.S.N. Murty, Course Coordinator & Head Biology Division, IICT, Hyderabad. The workshop was designed with two scientific sessions



Dr. J.S. Yadav, FNA, FTWAS, Director, IICT, delivering his welcome address at the Workshop. Prof. U.S.N. Murty, Dr. Sudhir A. Kulkarni and Dr. Gopalakrishnan are seen to the right of Dr. J.S. Yadav

comprising four lectures delivered by eminent personalities in the area of bioinformatics.

The first speaker Dr. V.N. Balaji from Jubilant Biosys, Bangalore delivered the talk titled *Development of docking screening protocol for enzyme inhibitor*

hit identification and lead optimization – A case study for HIV protease inhibitor. The second talk was by Dr. Sudhir A. Kulkarni, Novalead, Pune on *Use of Informatics for developing prediction tools for ADME and adverse drug reactions*.

In her talk Dr (Ms.) Madhavi Sastry, Schrodinger, Hyderabad elicited the *Role of Cytochrome P450 in drug design*. The last lecture of the day was delivered by Dr B. Gopalakrishnan, Senior Scientist, TCS,

Hyderabad on *The future of health care: Personalised medicines*. The technical sessions were followed by an interaction with the students and the faculty who participated in the workshop. The workshop ended with a vote of thanks by the chair.



TRAINING PROGRAMMES

Training on Use of Biofertilizers and Farmers' Interaction Day at NBRI

Under the Rural Development Project of CSIR, a Biofertilizer Training and Farmers' Interaction Programme (Farmers' Fair, *Kisan Mela*) was organized on 24 March 2012 at Banthra Research Station of NBRI. Participants included about two hundred farmers from Ramchaura, Kurauni, Banthra, Aurawan, Mirzapur Benti, Garhi chunauti villages, located around Banthra in Lucknow district; fifty farmers from various districts of U.P. and fifty students from Jawahar Navodaya Vidyalaya. The programme was aimed at disseminating the NBRI green technologies among the farmers.

The programme was inaugurated by Dr. C.S. Nautiyal, Director, CSIR-NBRI in the presence of Dr. S.K. Tewari, Nodal Officer and other members of the Rural Development Project team. On this occasion, a *navgrah vatika* was inaugurated by Dr. Nautiyal and other



Farmers' Interaction Programme at NBRI

dignitaries. The *navgrah vatika* had, in a line, the nine planets represented by plants (*Ark, Madar, Pipal, Gular, Shami, Kush, Khair* and *Dhak*). The other dignitaries Dr. O.P. Singh, In-charge State Training Centre, Rahman Khera, Dr. S.K. Chauhan, Principal Jawahar Navodaya Vidyalaya, Memoura and Shri Vinod Shukla presented their experiences of NBRI's training.

In the Farmers' Fair, eleven activities, relating to NBRI Green Technologies were displayed and extended through posters, models and extension bulletins (printed in Hindi). During this event, the visiting farmers had the opportunity to interact with scientists dealing with several NBRI technologies, understand the technical details, visit the field demonstrations and get on-the-spot answers to their problems.

The farmers registered themselves for biofertilizers (*Trichoderma* and PSB), seeds/seedlings/planting materials of identified crops like Tuberose, Marigold, Gladiolus, Bixa, Turmeric, Shatavari, Ashwagandha and vermicompost etc.

The process of preparing dehydrated floral crafts and simple Ayurvedic and nutraceutical formulations like *Giloe Satva, Vasavaleha* etc for health care and income generation was also demonstrated.

Women Imparted Training on *agarbatti*-making Technique at CSIR-CIMAP Women Entrepreneurial Training Facility

A group of about fifty women hailing from different villages of Lucknow, Unnao, Basti in Uttar Pradesh and Patna (Bihar) learnt the technique of making incense sticks using the powder of temple flowers at the CSIR-CIMAP Women Entrepreneurial Training Facility (WETF) situated near Chandirka Devi Temple, village-Kathwara, BKT, Lucknow on 14 March 2012.

A team of CSIR-CIMAP scientists apprised the participants about drying of the flowers and other bioresources collected from the temple and converting the same into powder and finally preparing the *agarbatti masala* mix. The women practiced making *agarbattis* by hand rolling and perfuming. It may be mentioned that the *agarbattis* made by women self-help groups using CSIR-CIMAP technology are being sold in the *prasad* selling shops located near the temple.



Training on hand-rolled *agarbattis* in progress at CSIR-CIMAP



CPYLS/LECTURES

CPYLS-2011 held at CSIR-IHBT

The CSIR Programme for Youth Leadership in Science (CPYLS) was held at the CSIR-Institute of Himalayan Bioresource Technology (IHBT), Palampur during 24-25 January 2012. The programme was attended by fifty selected meritorious students from Himachal Pradesh, and was coordinated by Dr. Aparna Maitra Pati.

While inaugurating the programme, Dr. Anil Sood, Chief Scientist, IHBT gave an overview of the S&T infrastructure of the country and scientific achievements.

Based on their interest, the children were divided into two major groups viz.

Biological Science and Chemical Science. The Biological Science group visited the tissue culture lab and got hands-on experience in the inoculation technique. They also visited plant DNA fingerprinting lab; genomics, metabolomics and proteomics facility; microbiology lab, and plant virology lab.

The Chemical Science group was exposed to various techniques used for the isolation of natural colours and dyes, isolation of chemotypes and development of herbal products. They also visited distillation units and herbal processing plants.

Students of both the groups visited the nanobiology, herbarium, GIS, mapping and computational facility. In the evening of the first day a movie $E=mc^2$ was screened in the auditorium.

In the concluding session, students expressed immense satisfaction and gratitude for the opportunity given to them to get acquainted with the frontline research being carried out at IHBT. They expressed their desire to visit IHBT again for a longer duration. All the students were given certificate of participation by Dr. Anil Sood.



Participants at the CPYLS function at IHBT

Prof. G. D. Yadav delivers the 62nd Foundation Day Lecture at CSIR-NCL

Prof. G. D. Yadav, Vice Chancellor and R.T. Mody Distinguished Professor, Institute of Chemical Technology (ICT), Mumbai delivered the National Chemical Laboratory (NCL) Foundation Day Lecture titled *Science & Engineering of Pores, Particles and Interfaces in*

Development of Green Processes at NCL, from the early century chemistry. He showed how pore structure influences the reaction pathway and how reaction media can change the course of reaction. The lecture was organised under the auspices of the NCL Research Foundation (NCL-RF).

Delivering an inspiring lecture, Prof. Yadav also dwelt on the concept of interfacial science and how an equation derived from basic research can help tune and particles with the help of case studies



LECTURES

the reaction pathway.

He discussed basic concepts of catalysts and catalysis, which are used in synthesizing new types of catalysts. Under his supervision ICT, Mumbai has developed catalysts with higher acidity compared to known catalysts. These have been patented as well. The same catalysts were tested in various industrially important reactions such as oxidation, dehydration etc. and shown to give more activity than the known catalysts.

Prof. Yadav exemplified a green route using which BPA, a monomer in polymer chemistry, can be synthesized. He also showed the concept of development of micro-reactors to be used in catalytic reactions. Later in his talk, Prof. Yadav discussed the importance of utilization of renewable feedstock, and biomass for future chemical and fuel needs. He showed examples of synthesis of biodiesel with high efficiency with the help of an appropriate catalyst. He also talked about the various uses of glycerol and glucose to yield chemicals that may find applications in various industries. At the end of his talk, Prof. Yadav challenged researchers to think differently and develop new types of catalysts that can be used in biomass conversions.

Dr. Sourav Pal, Director NCL and



Glimpses of the award ceremony function



Chairman, NCL-RF, in his welcome address presented a glimpse of the history of NCL from its formal opening followed by important historical events. Dr. Pal acknowledged and thanked the contributions of all those who were associated with NCL in making it a great institution. He urged the scientists to take pride in their endeavour. Dr. Pal congratulated the NCL-RF award winners in various categories.

The function was also attended by Prof. K.N. Ganesh, Director, Indian Institute of Science Education and Research, Pune, invitees, eminent personalities from reputed institutes, former scientists and students and staff of NCL. Towards the end of the function,

Prof. Yadav distributed the NCL Research Foundation Awards including Scientist of the Year Award (sponsored by Maneckji & Shirinbai Neterwala Foundation) to Dr. A. J. Varma and Dr. N. P. Argade, and Scientist of the Year Award (sponsored by Dr. R.A. Mashelkar Endowment Fund) to Dr. Sreekumar Kurungot.

Awards such as the new Initiative taken by the R&D Support System to support the staff, Director's Commendation Awards and Individual Merit Awards were also distributed by Prof. Yadav. Mr. G. Prabhakaran, Secretary, NCL-RF concluded the programme with a formal vote of thanks.



Nobel Laureate Prof H.W. Krotschiner Delivers Talk at CSIR-CGCRI

Prof. Harold Walter Krotschiner, winner of the 1996 Nobel prize in Chemistry (along with Robert Floyd Curl Jr and Richard Errett Smalley of Rice University, USA) for discovery of fullerene, delivered a special lecture on 3 February 2012 on *Carbon in Nano and Outer Space* at the Meghnad Saha Auditorium of the CSIR-Central Glass & Ceramic Research Institute, Kolkata. Prof. Krotschiner was a Professor at the University of Sussex, UK when he was awarded the Nobel Prize. He is currently affiliated with the Florida State University, USA.

Fullerene is the third form of carbon in nature. The fullerene molecule consists of 60 carbon atoms arranged as a spheroid. The molecules resemble a soccer ball or the geodesic dome design of the famous architect Buckminster Fuller; hence the name Fullerene. The carbon atoms in fullerene structure may be arranged in a cylindrical, ellipsoid, or spherical form. Fullerene has now become an iconic logo for nanotechnology.

Prof. Krotschiner divided his presentation into three major segments: his childhood ambitions' fullerene chemistry and related novel nanoscale structures' and natural philosophy. He delved upon carbon nanotubes in detail. He anticipated application of fullerene in plastic solar cells as fullerene can store electrons. He said molecular electronics would enable us to pack supercomputers into our wristwatch in the future.

Prof. Indranil Manna, Director, CSIR-CGCRI felicitated the Nobel Laureate with a silver plaque after the lecture.

Before his lecture, Prof. Krotschiner held discussions with senior scientists of CSIR-CGCRI and visited various laboratories in the institute, including Fibre



Prof. Krotschiner delivering his lecture

Optics & Photonics, Bioceramics & Coating, Glass Technology, Ceramic Membrane and Fuel Cell & Battery. After his lecture, Prof. Krotschiner had a special meeting with the students and



Prof. Indranil Manna felicitating Prof. Krotschiner with a silver plaque

scholars working at CSIR-CGCRI. Prof. Krotschiner engages himself in a special educational outreach work programme through the Vega Trust wherein he facilitates a broadcast platform for the science, engineering and technology communities.

The Nobel Laureate expressed satisfaction with the activities being carried at CSIR-CGCRI. In his complimentary message in the visitors book he penned down the following remarks:

"It is a great honour to follow in the footsteps of C.V. Raman and Linus Pauling and see the fascinating work being carried out here which is at the cutting edge of modern technology. I hope that the young people will find a humanitarian use for our C₆₀ molecule."

Prof. Krotschiner became the third Nobel laureate to visit CSIR-CGCRI in its history. Earlier, Nobel Laureates Prof. Linus Pauling and Prof. C.V. Raman had visited the institute in its formative years. People from several reputed institutes in the city attended Prof. Krotschiner's lecture at CSIR-CGCRI.



Prof. Krotschiner taking a question from a student in CSIR-CGCRI



NATIONAL SCIENCE DAY

CSIR-Central Building Research Institute

CSIR-Central Building Research Institute (CBRI) celebrated the National Science Day by organizing the National Science Day Lecture on 28 February 2012. The celebration offered an opportunity to bring issues of science to the centre-stage, and facilitate purposeful interaction between the science fraternity and the common people.

Prof. S.K. Bhattacharyya, Director, CSIR-CBRI, Roorkee narrated the contribution of Sir C.V. Raman in the field of spectroscopy, which has led to a wide range of scientific investigations and industrial applications. He stressed the role of National Science Day's objectives in transforming our society under the theme *Clean Energy Option and Nuclear Safety*. He felt that the National Science Day was an opportunity to take stock of the status of science in India. Such introspection is necessary as science and technology have become the most important drivers of the economy of the country.



A view of the dignitaries on the dais



Prof. S.K. Bhattacharyya, Director, CBRI addressing the gathering

Prof. Jagdish Rai, Department of Physics, IIT, Roorkee delivered the National Science Day lecture on *Lightning and its Applications*. He enlightened the audience about the earlier beliefs about lightning, lightning discharge phenomena, cloud formation, Boys Camera, electric and magnetic fields from lightning, current and velocity of red Sprites, and electric and magnetic fields of sprites. He informed that the earth and ionosphere act as very good electrical conductors at

extremely low frequency and very low frequency, forming an earth-ionosphere waveguide. Dr. B. Singh, Senior Principal Scientist introduced Prof Jagdish Rai and Shri S.G. Dave, Chief Scientist proposed the vote of thanks.

On this occasion, CBRI laboratories were kept open for school children to make them aware of the recent developments in science and technology. A CD related to training on construction of rural village housing was also released.



Release of CD of training on construction of rural village housing



A view of the audience



NATIONAL SCIENCE DAY

CSIR-Central Leather Research Institute

National Science Day was celebrated in a befitting manner at the CSIR-Central Leather Research Institute (CLRI) on 28 February 2012. Prof. Ajit Kumar Kotar of IIT-Madras delivered the National Science Day lecture on *Sustainable Energy Systems*. He reiterated that all energy sources must be made sustainable by developing enabling technologies. Prof. Kotar emphasized the need for greater role of Indian scientists, especially the younger generation researchers, in providing enabling technological solutions to deal with the emerging challenges in the realm of energy. Prof. A.B. Mandal, Director, CSIR-CLRI in his presidential remarks highlighted the extraordinary contributions made by C.V. Raman for the benefit of science, society and younger researchers. A documentary on C.V. Raman was also screened on the occasion.

CSIR-Central Scientific Instruments Organisation

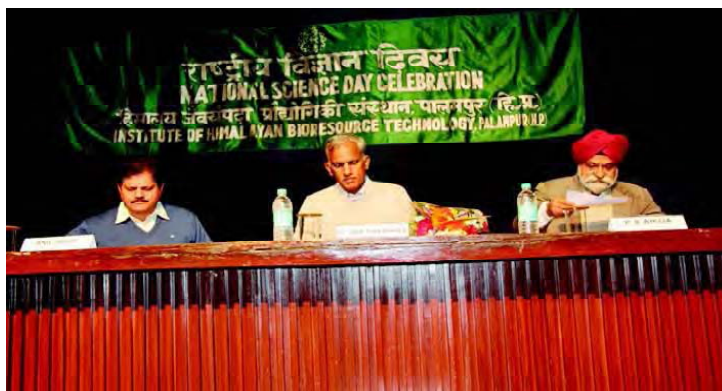
The CSIR-Central Scientific Instruments Organisation (CSIO) celebrated the National Science Day on 28 February 2012 by holding an *Open Day* and organising a National Science Day Lecture. All the laboratories of CSIR-CSIO were kept open for the general public in the forenoon. Around a thousand visitors, including students from various schools, colleges, universities and general public, went around the laboratories of the institute. They interacted with the scientists and were given exposure to the technologies available and being pursued at CSIO.

Later in the afternoon, Dr. S.R. Gowarikar, Former Director, CSIO (presently Director, Tulani Foundation, Pune) delivered the National Science Day Lecture entitled *The role of particle accelerator in development of science*. He said that research using the particle accelerator is being carried out for the past eighty years and even the discoveries of 1932 have not become obsolete yet. In his lecture he quoted: "There is nothing like pure science, pure physics or pure chemistry, knowledge has no boundaries". He also encouraged the scientists to re-think about the variations and appropriately apply the changes for innovations.

CSIR-Institute of Himalayan Bioresource Technology

The National Science Day was celebrated with great enthusiasm at CSIR-IHBT, Palampur on 28 February 2012. On the occasion, Prof. R. Uma Shaanker, Department of Crop Physiology and School of Ecology and Conservation, University of Agricultural Sciences, GKVK, Bangalore delivered the keynote address on *Why do plants have laxatives when they have no bowels to move?: An evolutionary perspective to bioprospecting*.

He highlighted the importance of secondary metabolites in plants and their ecological importance. He illustrated the



A view of the dais at the function

rich bioresource of our country and emphasized on sustainable development.

Dr. P.S. Ahuja, Director, CSIR-IHBT highlighted the contribution of CSIR and inspired the children to develop a scientific

temperament. He motivated them to become leaders rather than followers in their careers.

Dr. Arun Kumar Sinha, Senior Principal Scientist, Department of Natural Plant Products Division and his team members were felicitated for a novel work done at IHBT which earned them a publication in a very high impact factor

journal.

Dignitaries from CSK HPKV University, IVRI, IGRI, school children and teachers from local schools attended the function.



NATIONAL SCIENCE DAY

CSIR-National Aerospace Laboratories

The Twenty Fifth National Science Day Lecture was organized on 28 February 2012 at the S.R. Valluri Auditorium, NAL, Bangalore.

The Chief Guest, Prof Rohini M. Godbole, Centre for High Energy Physics, Indian Institute of Science, Bangalore spoke on *Probing the sub-femtoworld at the Large Hadron Collider (LHC)*. In her lecture she gave glimpses of the Femtoworld with the LHC, covering details about the world of particles, what is LHC?, why LHC?, what has it done so far? And what next?

Speaking on the occasion she said, "LHC is the largest microscope in space and biggest telescope in time. The accepted worldview is that Fundamental Particles are the quarks, the leptons and gauge bosons which carry the forces: the photon, the W/Z-boson, the gluon and the as yet, undiscovered Higgs boson." Prof. Godbole described Standard Model (SM) as the accepted picture of particle physics. It describes the fundamental particles, the forces between them and the ways that they combine to make other particles. She said as per the standard model the Higgs



A view of the dignitaries

Boson lies between the range of 100 GeV to 120 GeV. In order to confirm to us that our understanding of the underlying symmetries of the SM is correct, demonstration of the existence of the Higgs boson is a must and also a demonstration of its properties as predicted in the SM is a must!

So far, she said, there is no clear direct experimental proof for the Higgs boson, search for the Higgs boson and determination of its properties occupies the centre stage of all the current and planned experiments in High Energy Physics. This means that if we do NOT find a Higgs in the mass range required

by the SM, it will spell BIG problems for the SM: our understanding of fundamental constituents of matter and fundamental interactions among them! What do we want LHC to do, she asked. Give answers or hints to answers to the following questions: What are the symmetries of natural laws? Are there new interactions? How can we solve the mystery of the accelerating Universe? (This year's Nobel Prize went to the discovery that Universe

accelerates!) Are there extra dimensions of space? Do all the forces become one? Why are there so many kinds of particles? What is dark matter? Can we make it in the laboratory? What are neutrinos telling us? How did the universe come to be? And what happened to the antimatter? Prof Godbole was very optimistic and predicted the LHC would find the Higgs particle by the end of the year.

Dr C. Divakar, Jt. Head, KTMD welcomed the gathering. Mr M.K. Sridhar, Adviser, M&A presided over the function. Dr S. Sridhara Murthy, Head, KTMD proposed the vote of thanks. The function was anchored by Ms Sangeetha.

CSIR-National Botanical Research Institute

CSIR-NBRI observed the National Science Day on 28 February 2012. On this occasion a Microbial Technology knowledgebase was handed over to the Agriculture Department, U.P. Govt. for commercial exploitation and distribution to the farmers of Uttar Pradesh.

Dr. C.S. Nautiyal, Director CSIR-NBRI, welcomed the guests Prof. D.K. Gupta, Vice Chancellor, Chatrapati Sahu Ji Maharaj Medical University, Lucknow and Dr. Mukesh Gautam, Director Agriculture, Government of Uttar Pradesh. The technology has been

developed by Dr. C. S. Nautiyal and his team.

He stated that one of the major R&D activities of CSIR-NBRI has been developing stress-tolerant bioinoculants for diverse soil and climatic conditions. The formulations, containing beneficial



NATIONAL SCIENCE DAY



Glimpses of the National Science Day function

plant growth promoting microbes developed by the CSIR-NBRI team were used as bioinoculants. These formulations are useful as plant growth enhancers for seed, soil and foliar applications and improve the soil health, crop yield and quality. Application of the products has increased the yield of several economically important crops.

The knowledgebase holds particular promise for the farmers of the country, and hence its commercial production and wide spread application are necessary. Having realized this, a collaborative venture with the Dept. of Agriculture, Govt. of Uttar Pradesh was planned to transfer the laboratory results to farmers' fields in the State. Products like plant-growth enhancers for seed, soil and foliar applications developed by CSIR-NBRI were thus successfully transferred to the Dept. of Agriculture.

Commercial production in UP government's labs, based on the technology transferred had begun since 2004. As per the production and application statistics of UP Agriculture Department for the year 2010-11, 30 lakh packets were prepared, resulting in 3.16 lakh hectare area applied by *Rhizobium* and 5.61 lakh hectare area, applied by PSB

in UP alone. Such coverage of area under CSIR-NBRI biofertilizers has resulted in total fertilizer savings to the tune of 13,171 MT for nitrogenous and 29,227 MT for phosphatic fertilizers.

During the tenth and eleventh five-year plan, CSIR-NBRI developed a Phosphate Solubilising Bacteria (PSB) knowledgebase. The overall increase in the yield of bacterised plants using PSB knowledgebase compared with uninoculated controls was in the range of 10 to 30%. From 2012 onwards, the Dept. of Agriculture, Govt. of UP with technical expertise from CSIR-NBRI, envisages to cover 155-lakh hectare area by PSB for wheat (95 lakh hectares) and rice (60 lakh hectares).

The CSIR 800 Programme aims at providing a better life to 800 million people in the country through solutions in the area of health, agriculture, and energy thus empowering the masses. Under the CSIR 800 concept, the PSB knowledgebase was transferred to the Dept. of Agriculture, Govt. of Uttar Pradesh on the occasion of Science Day, 28 February 2012 for its further dissemination among Uttar Pradesh farmers.

Dr. Mukesh Gautam received the

culture and assured that the technology would be commercialized within 3-4 months. He commended the efforts of the Institute, specifically Dr. Nautiyal's group, for the cause of betterment of farmers.

Prof. D.K. Gupta presented a lecture on *Congenital Malformations*. He stated that out of 1.25 billion population, 2% of the children are born with this disorder. And out of these 2%, half have severe problems in the form of tumor, cancer and other deformities and 25% of them succumb to the diseases. He opined that the exact causes of these congenital malformations are unknown. However, it is presumed to be due to lifestyle disorders, excessive use of fertilizers, pesticides, environment, malnutrition, radiation etc. He advocated that plastic is highly dangerous, especially when food or water are used after microwaving. He expressed his concern about 45000 new cases of children being reported with cancer. A safe lifestyle and less pollution level are essential to save our children, he said.

The programme ended with a vote of thanks by Dr. S.K.S. Rathore. The programme was compeered and coordinated by Dr. J.K. Johri.



NATIONAL SCIENCE DAY

CSIR-North East Institute of Science & Technology

The CSIR-North East Institute of Science & Technology, Jorhat celebrated the National Science Day on 28 February 2012. Held at Dr. J.N. Baruah auditorium, the function was presided over by Dr R.C. Boruah, Outstanding Scientist, CSIR-NEIST. Shri Krishna Gopal Deb Krori, Chief Consultant, Water & Power Consultancy Service (WAPCOS), was the Chief Guest and delivered the National Science Day lecture. The function was attended by invited dignitaries, distinguished scientists, students, teachers, science fans and others, besides the old and new scientific fraternity of CSIR-NEIST.

Welcoming the audience, Dr P.R. Bhattacharyya, Senior Principal Scientist, CSIR-NEIST, highlighted C.V. Raman's work in creating the Raman Effect and the celebration of National Science Day to commemorate his discovery. He also mentioned the golden past of India in science and technology and stressed on the need for introspection on the slow growth of Science &



Er K.G. Deb Krori delivering the Science Day lecture. Also seen seated on the dais (from right), Dr R.C. Boruah, Outstanding Scientist and Dr P.R. Bhattacharyya, Senior Principal Scientist and Coordinator of the programme.

Technology in the country.

Delivering the Science Day lecture, Shri Deb Krori mentioned the works of Sir M. Vishweshwaraiah and other stalwarts in the field of medicine, astronomy etc. He further briefed about the transformation of C.V. Raman from an administrator to a scientist and stressed on the need for research in basic science for achieving excellence in applied science. Mr Krori further lauded the

contribution of CSIR-NEIST towards science and appealed to the scientists to bring their work to the international level. He particularly mentioned about the approach in earthquake study considering NE as an earthquake prone zone. He also said that India has a long way to go, though a lot of progress has been made in the field of science and technology. Shri Krori highlighted the importance and necessity of original research work in both basic and applied science for the development of the region in particular and the country as well.

In his Presidential remarks, Dr. R.C. Boruah also mentioned the necessity and importance of basic research. He said that CSIR-NEIST has worked in this direction and published a number of research papers in national and international Journals with high impact factors during the last year and has received CSIR Technology Awards during the past two years. The function concluded with the vote of thanks by Dr. S.P. Saikia, Scientist.

CSIR-National Metallurgical Laboratory

In commemoration of the National Science Day 2012, CSIR-National Metallurgical Laboratory (NML), Jamshedpur organized a popular science lecture on *Celebration of Science* by Dr. T. Ramasami, Secretary, Department of Science & Technology, Govt. of India, New Delhi.

Welcoming the gathering, CSIR-NML Director, Dr. S. Srikanth said, "The National Science Day is celebrated on February 28th every year in India, to commemorate the announcement of the discovery of the Raman Effect by Sir C.V. Raman for which he was awarded the Nobel Prize for Physics in 1930.

Although several Indians have since won the Nobel Prize in Science, these were for work carried abroad and are not credited to India."

Shri Anand Sen, Vice President, TQM & Shared Services, Tata Steel in his presidential address said, "Over the next 20 years, more than three billion people



HONOURS & AWARDS

CSIR-CFTRI Scientist Honoured as IFT Fellow

The Institute of Food Technologists (IFT) of USA has elected Dr Gokare A. Ravishankar, Chief Scientist, CSIR-CFTRI this year as the IFT Fellow. This is an honour bestowed on outstanding scientists in the field of Food Science and Technology who have demonstrated exemplary professionalism. IFT terms the award



as “a unique professional distinction conferred on individuals with outstanding and extraordinary qualifications and experience for their contributions to the food science and technology field”.

Dr. Ravishankar Gokare is the second Indian scientist to receive this award. He has served CSIR-CFTRI for the past thirty years. His research interests include plant secondary metabolites, bioactive molecules, plant tissue culture, plant biotechnology, algal biotechnology and food biotechnology. He has authored over 210 research publications in peer-reviewed journals, 40 reviews, and about 40 patents, with technology transfers to industries. He has guided 23 students for PhD and over 40 students for master's degree. He has managed over twenty five externally funded R&D projects obtained as competitive grants from DBT, DST, and Industries, besides the institute's in-house projects and CSIR network projects.

Dr. Ravishankar is a Fellow of the International Academy of Food Science and Technology (FIAFoST), National Academy of Sciences, India (FNASc), National Academy of Agricultural Sciences (FNAAS), Association of Food Scientists and Technologists of India (FAFST), Association of Microbiologists of India (FAMI), Indian Society of Agricultural Biochemists (FISAB), Indian Botanical Society (FBS), Society of Applied Biotechnology (FSAB), and Institute of Food Science and Technology of UK (FIFST). He is a recipient of several national awards viz., Indian Science Congress awards, Industrial achievement awards, and National Technology Day award, Government of India.

Dr Ravishankar will be honoured at the IFT annual meeting in June 2012, in Las Vegas.

will join the global middle class, and both India and China will top the list, thereby, pressure on our resource requirement of land and consumption of water will increase at least by 30%. Food storage and supply chain need to be boosted up. So, we have to shape our Science and Technology keeping these in view. Given the rich pool of human resources in India and our illustrious heritage and legacy in Science and Technology, achieving scientific excellence and leadership in the immediate future would be possible if we can create a scientific culture of excellence in the schools and ignite the passion of several young minds to pursue science.”

Former Managing Director, Tata Steel Dr. J.J. Irani in his address as the Guest of Honour, said, “Career of an individual is shaped by the prevailing condition of the country. It is the right time for us to take global lead in research and innovations. To me innovation should produce an idea that someone should buy and apply for creation of wealth. I am sure our new generation will rise up to the same.”

DST Secretary, Dr T. Ramasami, delivered a thought provoking lecture on *Celebration of Science – Youth: The Future of the Global Knowledge Economy*. Dr. Ramasami raised the issue: Why do we celebrate Science? It was because, he said, science as an endeavor is gaining in value in today's knowledge economy and Science, Technology and Innovation are fast emerging as the next drivers of economy and global power. The celebration of science in the modern world, he said, is for what it offers and not merely on account of what it is. Celebration of science is for both the endeavor and its value to solve problems of the people.

Dr. Ramasami was optimistic about the role of Indian youth in the global knowledge systems. He opined that India had the demographic dividends to take advantage of the trends in the global knowledge economy, with 29% share of graduate engineers and a projected median age under 30 by 2025.

Dr. Ramasami mentioned some important leads from Indian Science in recent years meriting celebration. These included – (1) In nano science, that flow of fluids through carbon nanotubes causes electrical signal was discovered in India and based on which today flow sensors are being designed, (2) New plant breeding techniques for enhancing seed viability; and (3) New Algorithm for primality testing. Dr Ramasami also elaborated on different Government plans and proposals for pursuance of science and technology for betterment and quality life.

Dr T. Ramasami also participated in an interactive session with more than 275 students from eminent local schools.



HONOURS & AWARDS

CSIR-IICB Scientist Receives Kshanika Oration Award

Dr Snehasikta Swarnakar, Senior Scientist, IICB, Kolkata has been awarded the prestigious *Kshanika Oration Award* 2008 of the Indian Council of Medical Research, Govt. of India for outstanding contribution in biomedical sciences. Her studies have provided new insight into the role of matrix metalloproteases (MMPs) in gastric inflammation as well as endometriosis. She has done phenomenal work in establishing MMP-9 dependent pathway for *Helicobacter pylori* infected gastric tissues.



She has demonstrated, for the first time, that curcumin acts on MMP-9 activity while preventing gastric ulcers. Dr. Swarnakar has also delineated the effect of oxidative stress on the initial trigger for c-fos expression leading to MMP-3 upregulation during the onset of endometriosis. Her extensive experimental work using various regulators of MMPs is quite impressive and a new paradigm shift in the field of gastroenterology. Dr. Swarnakar and her group have made excellent inputs in the field of Molecular and Cellular Biochemistry of Gastric Ulcers, Gastric Cancers and Endometriosis.

Prior to joining CSIR-IICB as independent scientist in the year 2002, she was engaged in postdoctoral research in the University of California, Davis, State University of New York, Stony Brook and Marine Biological Laboratory, Woods Hole, Massachusetts. She served as visiting faculty in The Scripps Research Institute, La Jolla, San Diego and University of Connecticut, Farmington, Connecticut, USA. She is also serving as guest faculty in the department of Environmental Sciences, University of Calcutta since 2007.

Dr. Swarnakar was an elected fellow of the Guha Research Council and West Bengal Academy of Science and Technology in 2010. She is the recipient of National Bioscience Award 2007 of Department of Biotechnology and Dr. A.N. Bhaduri Memorial Lecture Award 2009 of Society of Biological Chemists (India). She has more than 40 publications in reputed journals, two book chapters and few popular articles in well-read magazines to her credit.

CSIR-NEIST Scientist Awarded the Prestigious Coal Beneficiation Award

Dr B.P. Baruah, Principal Scientist, has been awarded the prestigious *Coal Beneficiation Award (Academic/R&D)* instituted by the Indian Institute of Mineral Engineers (IIME) for his outstanding professional contribution to Mineral Engineering. The Award was presented by Professor R Venugopal, President, IIME and Dean, Indian School of Mines, Dhanbad at the XIIth International Conference on Mineral Processing Technology, 2011 on 20 October 2011 held at Hindustan Zinc Ltd., Udaipur.



Dr. Baruah has been working in the energy and environment sectors for 35 years, particularly in the characterization, utilization and associated environmental quality for NER Indian coals. He has developed a number of processes for desulphurization of coal, gas and liquid fuels; site-specific management of acid mine drainage (AMD) in the coal mines, value added products from low grade coals and biomass wastes, and established structural parameters for NER coals for utilization. He has 22 R&D papers in SCI journals, 70 conference papers (national/international), 5 chapters in books and 7 patents to his credit. He has also authored four books. He is a fellow, life and associate member of national and international professional bodies. He was also earlier recipient of *Peravadhanullu Award* for best paper in international seminar on Mineral Processing Technology, 2008 on Coal Characterization organized by IIME.

CSIR-IMTECH Scientists Win Best Paper Award at RACES-2012

CSIR-Institute of Microbial Technology (IMTECH) scientists, Noorpreet Inder Kaur Dhanjal and Swaranjit Singh Cameotra, won the Best Paper Award in the National Conference on Recent Advances in Chemical & Environmental Sciences (RACES-2012), held at Patiala on 3 March 2012. Their winning paper was titled *Potential for Biodegradation of 4-Chloro-Bisphenyl (PCB) by a Pseudomonas sp.*



HONOURS & AWARDS

CSIR-NEERI Receives Two IWA Awards

International Water Association (IWA), U.K. conferred the *Project Innovation Awards (PIA)-Development* to CSIR-NEERI in recognition of excellence and innovation in water and sanitation projects. This award was conferred at a ceremony that took place at the IWA Urban Water Solutions Congress in Kuala Lumpur, Malaysia on 23 November 2011. The technologies developed by NEERI, i.e. NEERI-ZAR Multi Pollutant Water Treatment Unit received *Winner* and Solar Energy Based Electrolytic Defluoridation Plant received *Honour Winner* awards. On behalf of CSIR-NEERI, the scientists Dr. Pawan Kumar Labhassetwar and Dr. S.P. Andey received the awards.



National Metallurgists' Day Award for CSIR-CGCRI Scientist

Dr. Rajendra Nath Basu, Chief Scientist and Head, Fuel Cell & Battery Division of CSIR-Central Glass & Ceramic Research Institute (CGCRI), Kolkata received the National Metallurgists' Day of the Year Award of the Ministry of Steel, Government of India for the year 2011 for his significant contributions in the area of Energy, Environment and Waste Management Sector.

The award was conferred on Dr. Basu at the 49th National Metallurgists' Day and 65th Annual Technical Meeting of IIM on 14 November 2011 at Leonia International Centre for Exhibitions and Conventions, Hyderabad. The award carried a Scroll of Honour and a cash prize of Rs. 75,000/-. Dr. Basu received the award from Mr. P.K. Mishra, Secretary, Ministry of Steel, Government of India.



Dr R.N. Basu, Chief Scientist and Head, Fuel Cell & Battery Division, CSIR-CGCRI receiving the prestigious NMD Award from Shri P.K. Mishra, Secretary, Ministry of Steel, Government of India as Shri H.M. Nerurkar (middle), MD, Tata Steel Ltd and Shri Narayana Rao (*extreme left*), President, IIM look on

CSIR-NGRI Scientist Conferred Associate Fellow of Andhra Pradesh Akademi of Sciences-2011

Dr. Dewashish Kumar was conferred Associate Fellow of Andhra Pradesh Akademi of Sciences (FAPAS) for the year 2011 in recognition of his contribution to Science & Technology. Dr. Dewashish Kumar obtained his postgraduate degree in geophysics from ISM, Dhanbad and PhD from Osmania

University. He has been working in the field of groundwater management for the last twelve years through integration of hydrological and resistivity data sets using geostatistical methods. Dr. Kumar carried out studies for imaging near-surface structural features in the Mountain Front in northwest Himalaya

and delineation of hot springs for geothermal energy. He has published fifteen papers in national and international peer-reviewed SCI journals and presented about fifty papers in international conferences in and outside the country.



HONOURS & AWARDS

CSIR-NGRI Scientist Elected as Fellow to two Prestigious Societies



Dr. P.V. Sunder Raju, Senior Scientist at CSIR-National Geophysical Research Institute (NGRI), has been elected as a Fellow to two prestigious earth science societies in the world viz. Geological Society of London and Society of Economic Geologists, USA.

The Geological Society of London, was founded in 1807, and is the oldest geological society in the world. The Geological Society is a global leader in earth science publishing, and is renowned for its cutting edge science meetings

The Society of Economic Geologists (SEG), USA, originated at a 1919 gathering of a group of Geological Society of America (GSA) members who were especially interested in economic geology. The Society was established in 1920. Today, the Society consists of more than 5000 members residing in over ninety countries throughout the world.

Dr. Raju has published several scientific papers and recently wrote a book on gold mineralization in banded iron formations. He has also worked in several CSIR projects abroad for exploring mineral wealth. Currently, his research is focussed on the nature and occurrence of Platinum in association with Chromite in Dharwar and Central Indian cratons

Honours for CSIR-CLRI Scientist

Dr V. Kasi Rao, Associate Professor and Head, Documentation Division at CSIR-CLRI has been conferred *Innovative Researcher of the Year 2012* for his research paper at a National Education Conference on *Innovations in Teaching, Research & Extension (TRE) in Higher Education: Issues & Strategies*. This conference was held at Barkatullah University, Bhopal on 17 March 2012. The Conference was jointly organised by the Department of Continuing Education, Barkatullah University, Bhopal and ISEE, Chennai.



Two CSIR Scientists Honoured with the INSA Medal for Young Scientists-2012

Two CSIR scientists have been honoured with the Indian National Science Academy (INSA) Medal for Young Scientists-2012.



For Health Sciences the INSA Medal was awarded to Dr Rajnish Kumar Chaturvedi, Scientist, CSIR-Indian Institute of Toxicology Research, Lucknow. The award was conferred for his outstanding work in improving dopaminergic neuronal survival and use of neural stem cells as an alternate therapy in rat models of Parkinsons disease. Dr Chaturvedi has also made significant contributions to the identification of novel molecular therapeutic targets in neurodegenerative disorders like Huntington's disease.

Dr. Maheswar Ojha, Junior Scientist at CSIR-National Geophysical Research Institute, received the Medal for his significant research contributions in the area of gas hydrates (compounds of methane and water). Dr Ojha has been associated with development of new techniques for assessment of gas hydrate using seismic data and rock physics modeling. Since 2003, he has been working on delineation and quantification of gas hydrates. Dr. Ojha has participated in six scientific expeditions including the IODP Exp-323 in the Bering Sea, multi-channel and ocean bottom seismic data acquisition in the Bay of Bengal etc. He was awarded the BOYSCAST fellowship by DST and Visiting Scientist in University of Texas at Austin in 2011. He has published about 20 papers in peer-reviewed journals.





HONOURS & AWARDS

CSIR-NCL Scientist selected for OPPI Young Scientist Award-2011

Dr. Dattatraya H. Dethé, a scientist from CSIR-National Chemical Laboratory (NCL), Pune was selected for OPPI Young Scientist Award for 2011 for his research in the field of pharmaceutical sciences. The award carries a memento, a citation and a cash prize and was presented during OPPI's Annual General Meeting held on 27 September 2011 at Mumbai. OPPI instituted the *Young Scientist Award* in collaboration with Council of Scientific and Industrial Research (CSIR) as part of its public-private partnership to honour outstanding scientists working in India and encourage scientific culture.



Dr. Dethé works in the Organic Chemistry Division of CSIR-NCL and works in the area of total syntheses of bioactive natural products. After joining NCL in July 2009, he started a research programme on the total synthesis of bioactive natural products and their simplified analogues for structure-activity relationship (SAR) studies and new drug discovery. He judiciously combined his expertise in synthetic organic chemistry with biology to address important contemporary challenges in novel design of diverse molecular libraries for the discovery of new drugs by synthesis of various natural products and biological evaluation of these simplified analogues for SAR studies. In particular, biomimetic total synthesis of selective and potent antimalarial compounds, flinderoles B and C opens new doors for the new antimalarial drug discovery programme.

Dr. Dethé has thirteen publications to his credit and has also filed one patent. At present eight students are working with him. He is recipient of CSIR Young Scientist Award (2011) and Young Associate of the Indian Academy of Sciences (2011-14).

State level VGST Award for CSIR-CFTRI

Shri A.S. Kalyana Venkata Subramanya Sharma, Senior Principal Scientist and Head, Information and Publicity, CSIR-Central Food Technological Research Institute (CFTRI) has been awarded the *State Award for Outstanding Efforts in Science Communication* for the year 2011 by the Vision Group on Science & Technology, Govt. of Karnataka. The Award is the highest in the category in the state for achievements in science communication.

The Vision Group on Science and Technology is an independent body established under the Department of Science & Technology, Information Technology and Biotechnology of Government of Karnataka for promoting science and technology, research and S&T communication in Karnataka.

SIATIs Lifetime Achievement Award 2012 for CSIR-NAL Scientist

The awards for excellence in the indigenous development of defence and aerospace products, instituted by the Society of Indian Aerospace and Defence Technologies and Industries, were presented to eleven companies. The awards were presented by Mr. Shyam Shetty, Director, CSIR-National Aerospace Laboratories (NAL) and Dr. C .G. Krishnadas Nair, President, SIATI.

The lifetime achievement awards were presented to six persons who had contributed a lot to the defence and aerospace sector. Mr. M.K. Sridhar, Head Materials Science Division and Advisor (M&A), NAL received lifetime achievement award for the successful development of carbon fibre and transfer of technology to an industry.

Fellow of Ethnobotanical Society (FES) to CSIR-NEIST scientist

Dr. H. B. Singh, Scientist-in-charge, CSIR-NEIST Substation, Imphal was conferred the Fellow of Ethnobotanical Society (FES) 2011 by the Society of Ethnobotanists, Lucknow.





APPOINTMENTS/ANNOUNCEMENTS

Dr S. Masood Ahmed Appointed Member of Editorial Board of **PALAEO-3**

Dr S. Masood Ahmed, Chief Scientist, CSIR-NGRI has been appointed member of the Editorial Board of *Palaeogeography, Palaeoclimatology, Palaeoecology (PALAEO-3)*, an Elsevier journal for palaeoclimate and palaeoceanography. Dr Ahmed has carried out extensive work on stable and radiogenic isotopes from ocean sediments, corals and speleothems for constructing past climatic and monsoonal regimes. Dr Ahmed received the *National Geoscience Award for the year 2009* for his contribution to geo-environmental studies.



Dr Vijayamohan K. Pillai Assumes Charge as Director, CECRI

Dr Vijayamohan K. Pillai assumed charge as Director, CSIR-CECRI on 24 April 2012. An alumnus of the Indian Institute of Science, Dr. Pillai's research work of more than twenty years has been focussed on batteries, fuel cells, bio-electrochemistry, electrochemical sensors, chemically modified electrodes, anodization, electro-deposition, electro-organic synthesis, etc.



His research career was shaped by eminent scientists like Prof. S. Satyanarayana, Prof. S.K. Rangarajan, Prof. Amulya K.N. Reddy, Prof. A.K. Shukla, Prof. C.N.R. Rao, Dr R.A. Mashelkar, Prof. Samir K. Brahmachari and Dr S. Sivaram. Dr Pillai has more than 200 research papers and 15 patents to his credit. Under his guidance, 15 students have received Ph.D. degrees. He is a recipient of many prestigious awards including Medals of the MRSI and CRSI. He is a Fellow of the Indian Academy of Sciences and Affiliate Member of the IUPAC. He is also in the editorial board of several prestigious journals.

As the helmsman at CSIR-CECRI, Dr Pillai strives to make the institute an internationally renowned place for electrochemistry.

UPCOMING EVENTS

- A training programme will be organized at CSIR- Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow for farmers and entrepreneurs on cultivation, processing and marketing of economically viable medicinal and aromatic plants during 6-8 June 2012. The cultivation technology of economically viable medicinal and aromatic plants such as Lemongrass, Citronella Palmarosa, Mint, Vetiver, Patchauli, Rose, Geranium, Basil, Isabgol, Stevia, Ashwagandha, Kalmegh, Sarpagandha, Aloe and Satavar will be discussed. Besides, agrotechnologies, distillation and quality evaluation of aromatic oils will also be discussed.
- A two-day national seminar will be organized by CSIR-Indian Institute of Integrative Medicine (IIIM), J&K on *Catalyzing the Growth of Aroma Industry in J&K* during 2-3 July 2012 at IIIM Srinagar. The objectives of the seminar are: a) To provide a platform for exchange of knowledge and skills on present practices relevant to essential oils and aroma products; b) To enlist and research on recent issues concerning the essential oil trends, bringing advance/innovative essential oil technology, and find solutions to solve problems faced by the Indian aroma industry, and c) To identify essential oil producers to be able to establish direct partnerships with the essential oil users/buyers/stakeholders.

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