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# CSIR NEWS

*Progress, Promise and Prospects*

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C O N T E N T S

*National Technology Day Celebrations, 11 May 2011*



*NAL Developed Active Magnetic Bearings  
for a Vertical Sodium Pump*



*IICB Organized International Symposium on,  
Signaling Network and Cancer*



*INDO-US Workshop on, Nanotechnology in  
the Science of Concrete at CBRI, Roorkee*



*CSIR Programme on Youth for  
Leadership in Science (CPYLS)*



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



## National Technology Day Celebrations, 11 May 2011

May 11 is annually observed as National Technology Day all over India to commemorate technological breakthroughs such as mastering of nuclear weapons technology through a series of controlled tests at Pokhran. Nuclear power represents perhaps one of the most powerful technologies developed in the 20<sup>th</sup> century and this is a technology that is not easily available. The success of

India in developing nuclear power not only represented the acquiring of technological muscle but also success in an area, which is strategically important. May 11 is also the day when the indigenously developed *Trishul* missile was test fired and the indigenous aircraft *Hansa-3* took to the air.

On 11 May 2011, the Shanti Swarup Bhatnagar Sabhaghar in Anusandhan Bhawan marked another milestone in the use of technology in the history of CSIR. All the laboratories, across India, joined CSIR HQ in a virtual manner to take part in the Technology Day celebrations. Shri Pawan K. Bansal, Hon'ble Union Cabinet Minister, Ministry of Science and Technology, Parliamentary Affairs, and Earth Sciences and Vice President, CSIR and Shri Ashwani Kumar, Hon'ble Minister of State, Ministry of Science and Technology, Ministry of Earth Sciences, Planning and Parliamentary Affairs also graced the occasion.

Prof. Samir Kumar Brahmachari,



Dignitaries on the dais (from left): Prof. Samir Kumar Brahmachari, DG CSIR; Hon'ble Union Cabinet Minister, Shri Pawan Bansal; Hon'ble MoS for S&T, Parliamentary Affairs and Earth Sciences, Dr. Ashwani Kumar and Shri V. K. Gupta, Head TKDL, CSIR

DG CSIR welcomed the gathering. He was justifiably proud about the fact that all laboratories were linked either in virtual conferencing or tele conferencing modes. He said that Technology Day was being celebrated using technology. It is a way to communicate directly with all the laboratories of CSIR on Technology Day.

Prof. Brahmachari was delighted to share with all members of the CSIR

family the news that on 2 May 2011, in the State of Maharashtra and in the city of Pune, CSIR Tech Pvt. Ltd. (CTPL) has been incorporated under the Companies Act as a Private Limited Company. He said, "NRDC was established in 1953 as a not-for-profit entity. In 2011 we established CTPL to create wealth out of the knowledge that we have generated. I am happy to say that on 6 May,

Dr Vijay Kelkar has accepted the post of Chairman, CSIR Tech Private Limited (CTPL)."

Prof. Brahmachari explained that CTPL is a CSIR India initiative and a company that will work closely with CSIR laboratories to commercialize CSIR technologies and intellectual property, primarily but not exclusively, through the spin-off route that is creating technology start-ups by identifying



The release of book, *Vulnerability of Andaman Nicobar Islands to Natural Disasters* on the occasion



suitable spin-off opportunities; developing them further and then spinning them off as start-up enterprise. He said that on Technology Day, the best gift to give to the scientific community is to bring this new opportunity to them.

He pointed out that this was the first historical event when both our Ministers were able to address entire CSIR directly through technology route on Technology Day.

The book entitled *Vulnerability of Andaman Nicobar Islands to Natural*

*Disasters* by Dr Harsh Gupta was released by Hon'ble Union Cabinet Minister, Shri Pawan Bansal on the occasion. The Function ended with the Vote of Thanks delivered by Shri V. K. Gupta, Head, TKDL, CSIR.

## Address by Shri Pawan Bansal, Hon'ble Union Cabinet Minister, Ministry of Science and Technology & Earth Sciences and Parliamentary Affairs and Vice President, CSIR



The Hon'ble Union Cabinet Minister, Shri Pawan Bansal speaking on the occasion

We have assembled here to celebrate Indian Science, on this important day, the Technology Day. Indeed it gives me great pleasure to be here on the occasion. I greet and commend the dedication and achievements of our Scientists and Technologists. In the current times, those countries who innovate and innovate continuously to carve out “Global Technological Niches” which make business sense, rule the roost.

There are no two opinions that Indian Science and Technology has played a pivotal role in making the country self-reliant in many of the areas of socio-economic importance and also

helped it emerge as a strong player of knowledge economy. The role of CSIR has been unique and well recognized in this much-cherished journey.

When one talks of pursuing and achieving innovation, particularly of global relevance, the demand immediately emerges of the desired R&D resource – the manpower and the infrastructure. We have come a long way in both of these. Our country today is second to none if one talks of the ‘Human Resource.’ Necessity, however, is to quickly build and train such people who can pick up the emerging global challenges with focus on local application and deliver in the identified time frame, the sustainable solutions.

I must add here that the Academy of Scientific and Innovative Research (AcSIR) set up by CSIR would play an important role in current and emerging scenario. It would help meet, up to some extent, the human resource requirements in transdisciplinary areas.

The vibrancy of Science and Technology depends much on the role of National Innovation System of a country under its prevailing and emerging circumstances. CSIR, as an

integral component of Indian National Innovation System, has always played a key role. CSIR has laid the foundation for indigenous R&D in general and for industrial R&D in particular. CSIR's contribution for making the country self-sufficient in several key sectors is noteworthy. As a socially conscious organization, it has provided S&T needed for the masses, helped in mitigating appreciably the drudgery of Indian rural populace and provided solutions to many nagging problems. I am happy that the CSIR 800 programme is emerging as a unique initiative to bring in the desired socio-economic changes in our country.

India today is on a high-growth trajectory. The Government has focused on inclusiveness while achieving the desired growth. Necessary mechanisms to enable such a journey and achieve milestones have been put in place. The current decade has been declared the decade of innovation. CSIR has a special role to play in such a scenario. CSIR has developed ‘*CSIR Vision and Strategies for 2022*’ which not only embodies the philosophy of inclusive growth through desired S&T but also strategies to achieve and create desired



niches. CSIR thus wishes to reflect its R&D based on the dreams and aspirations of the people of India. There is great hope from this outcome-based endeavour, and I congratulate Prof. Brahmachari and the CSIR family for achieving this.

The Hon'ble Prime Minister and President, CSIR has complimented CSIR for the excellent work that CSIR was doing under the leadership and guidance of Prof. Brahmachari. Referring to the document '*CSIR Vision and Strategies for 2022*', he said, "once the document is approved by the Governing Body, there should be wide dissemination of ideas contained in the Vision Statement. There should be a countrywide debate as to how we can translate this Vision into effective strategies and effective programmes for

implementation. I think the CSIR now will be preparing the 12<sup>th</sup> Five Year Plan and, therefore, some of these ideas must be translated into concrete programmes of action."

The Hon'ble Prime Minister further added and I quote that "the institution is entering more creative phase and I dare say we have done well but the best is yet to come and in that I think all of us have to be partners in progress and converting the dreams of the people of India, of a billion people, into solid groundwork for positive creative action spurting research. That is the mandate of the CSIR." I thus see huge responsibility on the shoulders of CSIR scientists. They will have to rise to the occasion as they have done in the past. I am sure they would do so and make the country proud.

CSIR in the 12<sup>th</sup> Plan is focusing on '*Prosperity of People while Protecting the Planet*' and helping in building a sustainable inclusive model for development. CSIR is an accomplished national leader in high-end knowledge generation. It receives the largest number of Indian patents and is leader in US patents awarded to our country and utilization of them. CSIR programmes namely, '*Open Source Drug Discovery*' based on CSIR's novel open innovation movement using crowd sourcing as a model and '*Traditional Knowledge Digital Library*' have already emerged as path setters globally. I wish the members of CSIR Family all the best and would like to say that we are all with them in their unique R&D endeavours.

Thank you.

### Address by the Hon'ble Minister Dr. Ashwani Kumar, Minister of State for Science and Technology, Parliamentary Affairs, Planning and Earth Sciences

We have all gathered here to celebrate Technology Day. Technology Day has been a very special day for Indian science since 1999. It is significant because India achieved milestone technological advancements on this day: The first indigenous aircraft '*Hansa-3*' was test flown in Bangalore on this day. India also achieved a successful test firing of the '*Trishul*' missile and executed three successful nuclear tests carried out at Pokhran all on the same day—11 May 1999.

This is a day to recognize, acknowledge and applaud the

contributions of our outstanding innovators, scientists and technopreneurs who relentlessly pursue their dreams with passion and commitment and earn laurels for our nation. The work of our scientists in the areas spanning medicine, agriculture, rural development, renewable energy sources, materials technology, ecology and environment is changing our world and spearheading a remarkable silent revolution, which is shaping our country's progress through this decade of innovation. On this Technology Day, I would like to dedicate my comments

to technological innovation considering its paramount role in giving our nation a strategic edge in comparison to our competitors.

We need to look differently at our science and technology priorities and this is an opportune time to re-think the Indian innovation paradigm to enable it to address disparities and inequities in our system. India has a number of strengths and strength in numbers: a strong R&D base; burgeoning academic talent; it is a leading innovation player in certain key economic sectors such as biotechnology, pharmaceuticals,



automotive components, Information Technology, software, and IT enabled services (ITES); and a stable and supportive macroeconomic environment. These strengths need to be harnessed to address the basic needs of our people and to transform India into a global science and technology powerhouse.

In this endeavour, the generation of ideas is critical. Central to the ideation process is to *“Trust things that are alien, and alienate things that are trusted.”* In other words, we must be adept at both learning and unlearning. That is what is at the heart of the culture of innovation. Technological innovations must revolutionize products, processes and practices. And yet we must constantly ask ourselves whether Technology Promotes social and economic justice? Ensures distributive equities? Favours people over machines? Maximizes economic gains while conserving and optimizing our environmental resources? Favours conservation over waste? Favours the reversible over the irreversible? This is

important because if problems occur after the technology is adopted, steps can be taken to reverse its negative impact.

With the Indian population crossing the 1.1 billion mark, never has there been a greater relevance for cost effective technologies for medicine, healthcare, appropriate rural technologies, water, land use and conservation and protection of the environment. A consequential explosion of consumer demand, spread across a range of low- and middle-income segments, allows India to experiment with different scaling strategies, making the cost of pursuing ‘frugal innovation’ models much lower for firms in India than for most competitors in other emerging markets. Such a strategy which has been termed “more from less for more people” (MLM) is what we need to explore.

Truly “inclusive” innovation is where the poor can potentially have the same



The Hon'ble Minister of State for S&T, Parliamentary Affairs, Planning and Earth Sciences, Dr. Ashwani Kumar addressing the audience

‘functional and emotional experience’ as the rich have for a fraction of the price. Tata’s *Nano* is a befitting example of this. A two-wheeler scooter owner in India today can afford to buy the world’s cheapest car, *Tata Nano*, costing \$2,000. With this, India not only got its “people’s car” but also rewrote global automotive history. There have been many more such creative endeavours that have helped “Innovate India” and I site a few:

Thanks to its innovations in outsourcing, Bharti Tele-Ventures offers some of the world’s lowest telephone prices. Others too are following suit. Innovations in supply chains have integrated those at the bottom of India’s economic pyramid, as exemplified by the successful e-chaupal operations. These cyber kiosks, established in thousands of villages, have given farmers the power of information—eliminating middlemen and resulting in higher productivity and better prices for farmers.

Unilever in India has adopted what Michael Traem calls a “Fight” strategy to cater to the middle segment of the Indian market. When introducing the “Wheel” detergent brand, Unilever



A view of the audience



purposefully went beyond its traditional approach and adopted some of the key business principles of the local Indian challengers. A critical element was product availability: India's 627,000 villages are spread over 3.2 million square kilometers, and Unilever's Indian subsidiary has built a strong distribution system that helps its brands to reach the rural market. To service remote villages, stockists use auto rickshaws, bullock carts, and even boats in the backwaters of Kerala.

An organization in Madurai has innovated and already created global benchmarks: Aravind Eye Hospital. Aravind evolved an eye surgery technique that increases a surgeon's productivity by a factor of 10. This business model ensures that millions of poor, visually impaired people can be operated for free or nearly free, and that the hospital still makes 40 per cent operating profit. It does 200,000 cataract surgeries a year, making it the largest ophthalmology institution in the world. Further, students from Harvard and John Hopkins come here for exposure and training. The insight from Aravind is that 'global benchmarks are a result of pursuing a great cause'.

A high-powered research team from International Development Enterprise (IDE) observed Maharashtra cotton farmers using drinking straws in a novel way for drip irrigation and developed a material that is more suited for this activity. It is now distributed worldwide as a commercial product with an in-built technology that is more appropriate for small and marginal farmers. Also, the maintenance of the system can be carried out within the village, thereby creating indirect employment. This not

only adds social value to the villages concerned, but is also commercially useful.

Indeed, as Eric Hobsbawn reminds us: "Utopianism is probably a necessary social device for generating the superhuman efforts without which no major revolution is achieved."

It is also time to rethink the role of advocacy by the S&T establishments in the policy making process and in our efforts toward ecological sustainability. Meeting fundamental human needs while preserving Earth's life support systems, will require an accelerated transition toward sustainability. Man-made calamities and natural disasters such as the one in Fukushima, point to the need for a renewed focus on institutional innovations for safety and security in nuclear energy plants. The scientific talent and extraordinary range of technology innovations that organizations such as the CSIR, DRDO, DST, DBT, ISRO, Ministry of Earth Sciences have demonstrated has helped us to achieve greater heights. Innovations like CSIR-800, TKDL, OSDD and cloud-sourcing have demonstrated the innovative use of harnessing technology.

The new ICT tools can change learning paradigms and impact sectors such as education, health, agriculture etc. In a study of 120 countries, researchers found that every 10 percent increase in broadband adoption increased a country's GDP by 1.3 percent. In India the Internet can be increasingly leveraged to give access to improved services to the 1 billion connected people, which will have a profound impact on the socio-economic development of the country.

The Steering Committee on Communication, Information Technology and Information for the formulation for the Twelfth Five Year Plan in its latest meeting has proposed a focus on the "*Democratization of Information for Inclusive Growth*". The plan seeks to provide connectivity to 250,000 panchayats through fibre optics in the coming Plan period. We require 100 million broadband connections while the current number stands at 10 million in a country of over one billion. While the target is ambitious, it is nevertheless, doable. However, a technologically innovating India must deepen and enlarge the scope and reach of R&D through much larger allocation of funds for the purpose in the private and public sector. The budget allocation of a mere 0.98% of GDP to R&D has to be increased. We need to realize that India's strategic power will be measured by our ability to leverage our scientific and technological accomplishments in the service of our national goals.

We recognize that for India to emerge as a major player in global innovation, a multi-pronged strategy needs to be embraced and implemented. We need to use technology foresight to make the right technology choices in the overall context of our national imperatives. India's choice of the fast breeder technology as part of the closed nuclear fuel cycle strategy illustrates how technology foresight analysis helps in the selection of critical technologies for development at any point of time. The choice here was dictated by the fact that India has limited uranium reserves and the world's largest thorium reserves. Secondly, we need to establish an innovation ecosystem whose relevance



to our future is ensured by leveraging international cooperation in the service of our innovation strategies.

Let me take this opportunity to compliment the entire scientific fraternity of CSIR and our nation for

their relentless and creative endeavour to achieve technological excellence in various spheres in the service of our overarching national priorities. Let me conclude with a quote from E. Hubbard who wrote: “Celebration of

*Technology Day is a celebration of human genius. One machine can do the work of 50 ordinary men. However, no machine can do the work of one extraordinary man.”*

## Welcome Address by Director General, CSIR, Prof. Samir K. Brahmachari



DG-CSIR, Prof. Samir K. Brahmachari delivering the Welcome Address

Hon’ble Minister Shri Pawan Kumar Bansal, Ministry of Science and Technology, Earth Sciences and Parliamentary Affairs and Vice President CSIR; Hon’ble Minister Shri Ashwaniji, Minister of State for Science and Technology, Parliamentary Affairs, Planning and Earth Sciences, Members of CSIR family, Ladies and Gentlemen.

Technology Day is being celebrated using technology. This month we have seen the power of technology in the operation that the US undertook. I was wondering what a marvel of technology, (it was) how one could, look, see, communicate, interact and operate over

long distance. And today, we are using technology to reach the entire CSIR family on 11 May. This is a new tool and a new power to reach the masses. We are connected to 40 different laboratories at this moment....thousands of people. It is a way to communicate directly with all the laboratories of CSIR on Technology Day. It is a great opportunity; we have both our Ministers here, so

it is a way to communicate their expectations and also to tell us the expectation that Planning Commission has about the 12<sup>th</sup> Plan. Thus we thought that it would be a good idea on Technology Day to have connectivity with all the laboratories.

Sir, CSIR Head Quarter is not the brain of CSIR. The brains of CSIR are in its laboratories. At the best, Head Quarter is like a railway junction with the trains passing through but it is not the biggest terminus, unlike DRDO, ISRO or BARC etc., where the Head Quarter is the main brain centre. CSIR’s brains are in its arms. There are 40 such

arms (37 laboratories +3 units) making the difference.

This year on Technology Day one of our long-standing dreams has been fulfilled. On 2 May 2011, in the State of Maharashtra and in the city of Pune, CSIR Tech Pvt. Ltd. (CTPL) has been incorporated under the Companies Act as a Private Limited Company. NRDC was established in 1953 as a not-for-profit entity. In 2011 we established CTPL to create wealth out of the knowledge that we have generated.

To add another feather in the cap, Sir, I am happy to say that on 6 May, Dr Vijay Kelkar has accepted the post of Chairman, CSIR Tech Private Limited (CTPL). We really thank Dr Kelkar who steered CSIR in 2004 in the Kelkar Committee when a vision was seeded that the CTPL should be formed. During the last year, Hon’ble PM approved. CSIR scientists and those in publicly funded organizations can float the company and hold equity.

CTPL is a CSIR India initiative and a company that will work closely with CSIR laboratories to commercialize CSIR technologies and intellectual



property, primarily but not exclusively, through the spin-off route that is creating technology start-ups by identifying suitable spinoff opportunities; developing them further and then spinning them off as start-up enterprise. This is the

entire exercise and I thought that on Technology Day, this is the best gift to give to our scientific community bringing this new opportunity to them.

I welcome all of you and I thank both of you Sir, for being here on this

day to address this organization. I think this is the first historical event when both our Ministers will be able to address entire CSIR directly through technology route on Technology Day.

## Technology Day Celebrations at CSIR Laboratories

The CSIR Institutes/laboratories also celebrated the Technology Day with great jubilation. The programmes organized on this occasion at some of these are briefly described here:

### Institute of Himalayan Bioresource Technology (IHBT), Palampur

The Institute of Himalayan Bioresource Technology (IHBT), Palampur celebrated the National Technology Day on 11 May 2011. Dr S. Ayyappan, Director General, Indian Council of Agricultural Research (ICAR), New Delhi delivered the Keynote Lecture on, *Feeding Crores Forever*.

In his lecture Dr. Ayyappan revealed several top priorities of agricultural R&D in India. These included standardizing soil-plant water management system, integrated farming, integrated nutrient management, precision farming, drought proofing, harnessing biodiversity, developing stress-resistant cultivars, farm mechanization, efficient energy management, post-harvest

management, minimizing storage losses, development of disease diagnostic kits for animal husbandry, climate resilient agricultural initiatives, developing Agropedia and IT based decision support system, empowering farmers, strategies for region-specific farm production target.

Dr. S. Ayyappan visited the farms and research facilities of the Institute and interacted with scientists. He was greatly impressed by the ambience and the work being carried out by IHBT and assured whole-hearted support from ICAR.

In his Presidential remarks, Prof. V.L. Chopra, former Member, Planning Commission opined that today at global level food production is not

an issue, it is rather the availability of food in a particular geographical location that is a great challenge to meet. Dr Naresh Kumar, Head HRDC Ghaziabad, CSIR highlighted that one of the mandates of CSIR is developing strong linkages and synergies with like-minded agencies at ICAR, ICMR etc. Prof. S.K. Sharma was optimistic of building strategic partnership between HPKV and IHBT on several common technological issues.

The Technology Day Function was attended by a large number of students, scientists and dignitaries from institutions like IVRI, IGFRI, etc. in and around Palampur.

### National Botanical Research Institute (NBRI), Lucknow

National Technology Day was celebrated at NBRI on 11 May 2011. A Function was organized in NBRI auditorium. Prof. P. K. Gupta Hon. Emeritus Prof. & NASI Senior Scientist,

Ch. Charan Singh University, Meerut was the Chief Guest of the occasion.

Prof. Gupta delivered a lecture on *Technology Driven Botanical Research in the Age of Genomics and*

*Information Technology* on this occasion. Scientists and Research Scholars of NBRI were present. The general public including students from schools and colleges visited the different



Sitting on the dais (from left) are: Prof. P. K. Gupta Hon. Emeritus Prof. & NASI Senior Scientist, Ch. Charan Singh University, Meerut and Dr. C.S. Nautiyal, Director, NBRI

laboratories, expositions, botanical garden, herbarium of the Institute as this day was declared as open day.

Dr. C.S. Nautiyal, Director, NBRI while welcoming and introducing the Chief Guest emphasized that it is important that good scientific leads must be converted into technologies for the benefit of nation and the common man. He further said that Technology Day is celebrated to mark the many of technological achievements made by the country especially CSIR in our context. This occasion reminds us to translate the research into technologies and business.

The Chief Guest, Prof. P. K. Gupta, while delivering his lecture highlighted on some newer technologies, which revolutionized research in biology. He elaborated about the development of a number of automated high throughput technologies. He said that the technology driven research has also generated massive data in different areas of the so-called science of "Omics" that is Genomics, Transcriptomics, Proteomic,

Metabolomics etc. & necessitated parallel development of the discipline of plant bioinformatics utilizing information technology. He elaborated the various techniques developed in the last few decades marking the beginning of an era of molecular biology, which later influenced all disciplines of biology. He emphasized that these

technological developments in biology are useful for understanding biological systems.

Prof. Gupta finally summarized his lecture with the address to students that we will work not only towards development of newer technologies, but also towards utilization of newer technologies that are being developed on a regular basis for motivation of students to adopt science as a career. Prof. P. K. Gupta applauded the efforts of NBRI in developing herbal products/ technologies.

On this occasion, technology/ knowledgebase of NBRI namely, "Microbial pesticide technology based on *Beauveria bassiana* (strains NBRI-9947) for managing pod borer of chickpea and pigeonpea and termites in field crops" was transferred to M/S Balaji Crop Care Pvt. Ltd. (Sowbhagya group)

Cheralapally, Hyderabad-500051, Andhra Pradesh.

NBRI has developed this technology based on *Beauveria bassiana* (strain NBRI-9947) which is effective against most damaging pest i.e. pod borer of chickpea and pigeonpea and also termites of field crops. The formulation developed is talc based 1% wettable powder with colony forming units (cfu  $1 \times 10^8$ /g minimum). NBRI has generated toxicological data of primary culture and formulated product, shelf life data, bioefficacy data on one crop. The product has got one year shelf life. This technology was developed by Dr. C.S. Nautiyal, Director, NBRI and Prof. H. B. Singh, former Scientist, NBRI and at present Professor Institute of Agriculture Sciences, BHU.

Dr. K. Muralidharan, Director Technical, M/S Balaji Crop Care Pvt. Ltd. (Sowbhagya group) Cheralapally, Hyderabad was present on the occasion.

Dr. S.K.S. Rathore, Scientist & Head, Technology Transfer and Business Development Division compeered the Function and facilitated handing over the transfer document. He also proposed the Vote of Thanks.



Microbial pesticide technology being transferred to industry



## North East Institute of Science & Technology (NEIST), Jorhat

The North East Institute of Science & Technology (NEIST), Jorhat celebrated National Technology Day at its premises on 11 May 2011 with a well charted out programme. Every year this day is celebrated as National Technology Day to mark the tremendous Indian technological potential.

Welcoming the gathering, Dr P. G. Rao, Director, NEIST, Jorhat highlighted the significance of the day and also spoke about the technologies developed by NEIST over the years. He said that NEIST is also working in the field of low-cost drugs for affordable healthcare especially herbal drugs. He informed the gathering that NEIST has received the license by Drugs Licensing Authority, Guwahati to manufacture its recently developed herbal drugs (Anti-arthritis and Fungi destruct) for free distribution to people.

Dr J. Mahanta, Director, Regional Medical Research Centre (RMRC), NE Region, ICMR, Dibrugarh graced the Function as the Chief Guest and gave an illuminating Technology Day lecture on, *Challenges for Technology in Medical Diagnostics & Personalized Drug Therapy*. He said that the time span between development of different technologies and breakthroughs have reduced nowadays. Further, he said that the requirement for technology development has arisen to create a disease-free world, to sustain high quality of life and longevity. He discussed about technologies used and challenges in molecular diagnostics.



Dr J. Mahanta, Director, RMRC NE Region, ICMR, Dibrugarh delivering the Technology Day Lecture, Dr. P. G. Rao, Director, NEIST is seen on the dais

Dr Mahanta also talked about advances in pharmacological sciences like tailored drug therapy and genetic profiling. He said that today predictive biomarkers for various diseases have made it easy to diagnose and identify the possibility of early infection. He explained about personalized drug therapy and advances in instruments used in medical research. Towards the end,

he talked about nano-biotechnology in medicine. He said that it may play a tremendous role in diagnosis and therapeutics for conquering many diseases. He concluded by saying that the technologies should be developed to conquer challenges faced in medical diagnostics like etiology of unknown diseases, to develop personalized medication etc.

Befitting the occasion, Mr. B. C. Saikia, Scientist, NEIST highlighted the patent status of the Institute during the financial



Release of Newsletter, *NEIST News* by Dr. J. Mahanta, Director, RMRC NE Region, ICMR, Dibrugarh (right) and Dr P. G. Rao, Director, NEIST on the dais (left).



Students and teachers visiting NEIST



year 2010-2011, which showed improvement over the previous year. *NEIST News*, a bimonthly newsletter of the Institute was formerly released by the Chief Guest, who highly appreciated

the publication. The Function concluded with Vote of Thanks by Mr Dipankar Neog, Scientist, NEIST.

The day was also observed as 'Open Day' and the laboratory was kept

open for the visit during morning hours. About 500 students accompanied by teachers and others came and interacted with the scientists.

## NAL Developed Active Magnetic Bearings for a Vertical Sodium Pump

Though the phenomena of magnetic levitation has been discussed as early as 1842 by Earnshaw, the research on magnetic levitation of rotating or moving systems gained momentum with the advent of reliable electronic components in recent years. The device used for supporting a rotor by magnetic levitation is termed as magnetic bearing, which consists of mechanical components as well as electronic components such as sensors, power amplifiers and control circuitry. Thus, it is a mechatronic product and the development of active magnetic bearings requires knowledge in multiple disciplines.

In magnetic bearings there is no physical contact between the stator and the rotor. Owing to the absence of contact, these bearings have several advantages over conventional (slider and rolling element) bearings. The principle advantages are numerous, such as: low power loss, no lubrication, no leakage problem, suitability for application in high pressure

or vacuum, high rotor speed and longer bearing life. Furthermore, the stiffness and damping characteristics of the magnetic bearings are easily adjustable according to the requirement. Magnetic bearings can operate in a wide range of temperature from  $-250^{\circ}\text{C}$  to  $450^{\circ}\text{C}$ .

Application of magnetic bearings in various fields may be found in the literature employing different control strategies. The Propulsion Division of National Aerospace Laboratories

(NAL), Bangalore is one of the leading research groups in this area, as research activities have been carried out towards indigenous development of Active Magnetic Bearing Technology leading to successful demonstration of 5-axes levitation of a rotor weighing 5 kg and speed up to 10000 rpm at NAL, Bangalore.

In recent years, there have been instances of the use of magnetic bearings in nuclear reactor systems.

Vertical centrifugal sodium pumps are used for circulation of coolant in the primary and secondary circuit of fast reactors for nuclear power plants. Lubrication oil leak from the conventional bearings used in these pumps is a potential threat to cause reactivity changes, which could culminate in extended reactor shut down. Actively controlled magnetic bearings, which do not require lubrication is an excellent alternative to conventional bearings used to overcome the above referred problems.

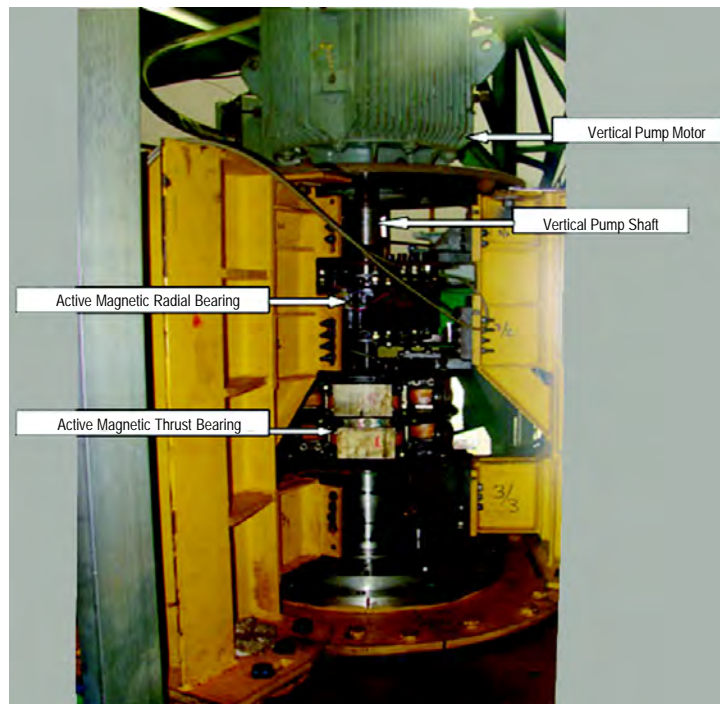


Fig. 1: AMBs Installed at IGCAR Pump Test Rig



A development program had been initiated towards this goal by NAL in collaboration with IGCAR, Kalpakkam. It was decided to develop indigenously, the active magnetic bearings to be retrofitted in an existing centrifugal pump of 50m<sup>3</sup>/h capacity at IGCAR, Kalpakkam. The activity basically involved development of thrust and radial active magnetic bearings catering to a thrust load of around 1050 N and a nominal radial load for the existing vertically configured shaft system of the centrifugal pump and demonstration at 2900 rpm under simulated conditions followed by commissioning of the bearing system on site at IGCAR. This necessitated the development of actuators and a direct feedback control systems for radial/thrust magnetic bearings ensuring proper stiffness in the bearing planes from rotor dynamics point

of view resulting in smooth running of the shaft system up to the design speed.

During the course of this activity a successful attempt to realize improved actuator response was made which resulted in filing for a patent (ref: 0613 DEL 2009) and an innovative design for the thrust disc have been realized. The application of active magnetic bearings for centrifugal pump under simulated

conditions was successfully demonstrated in presence of scientists of IGCAR at NAL before successfully commissioning of the same at IGCAR (Figure 1). Performances of the magnetic bearings have been tested successfully, by running the pump rotor up to full operating speed of 2900 rpm. The measured vibration levels are within allowable limits (Figure 2).

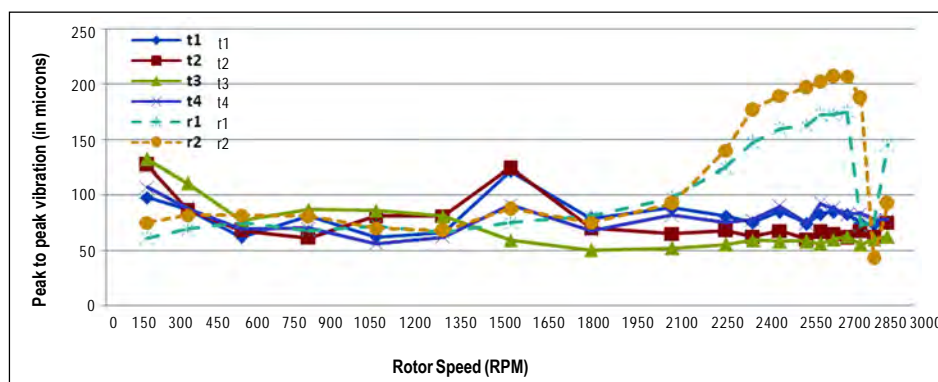


Fig. 2: Measured Vibrations for Thrust (t1,t2,t3,t4) and Radial (r1,r2) AMB Sensors

## CSIR's Breakthrough in Bamboo Flowering

*Dr P. Cheena Chawla*

Just think of a versatile plant with unparalleled utility. Sure, the word 'bamboo' comes to the mind of most of us, although Nature is replete with many plants with multifarious uses. The obvious reason is that this fast-growing hardy grass has enormous utilities ranging from making beautiful hedges and fences for landscaping; constructing structures like walls, roofs and floors, and building bridges to making musical instruments like flutes, xylophones and

wind chimes, and of course, designing a host of furniture items. Besides, most bamboo shoots are edible and in times of massive flowering of bamboo the seeds are even used as grain.

It is, however, amazing that bamboo flowers only once during its lifetime and that happens once in 7 to 100 years, depending on the species. Interestingly, there occurs 'gregarious' flowering as the bamboo clumps flower at the same time. Thereafter, the plants die. Coming

to the rescue of this much valued plant, CSIR scientists in the year 1990, created history by making the flowering in bamboo possible within weeks – a feat that could never occur naturally. This breakthrough was achieved by employing the amazing power of tissue culture technology.

Plant tissue culture, also called micropropagation, simply involves the growing of small tissues of plant material in a sterile environment for propagation



of that species. Not just that. This technique is also of special interest to plant breeders and biotechnologists, for it allows controlled manipulation of plants at the cellular level for obtaining new and better plant varieties that are resistant to stress, insect pests and to various diseases. Besides, plant tissue culture helps in the mass propagation of specific germ-free plants. Just as vegetative propagation such as cutting, layering, and grafting, propagation by tissue culture also helps in producing clones, which are genetically identical plants derived from the same individual.

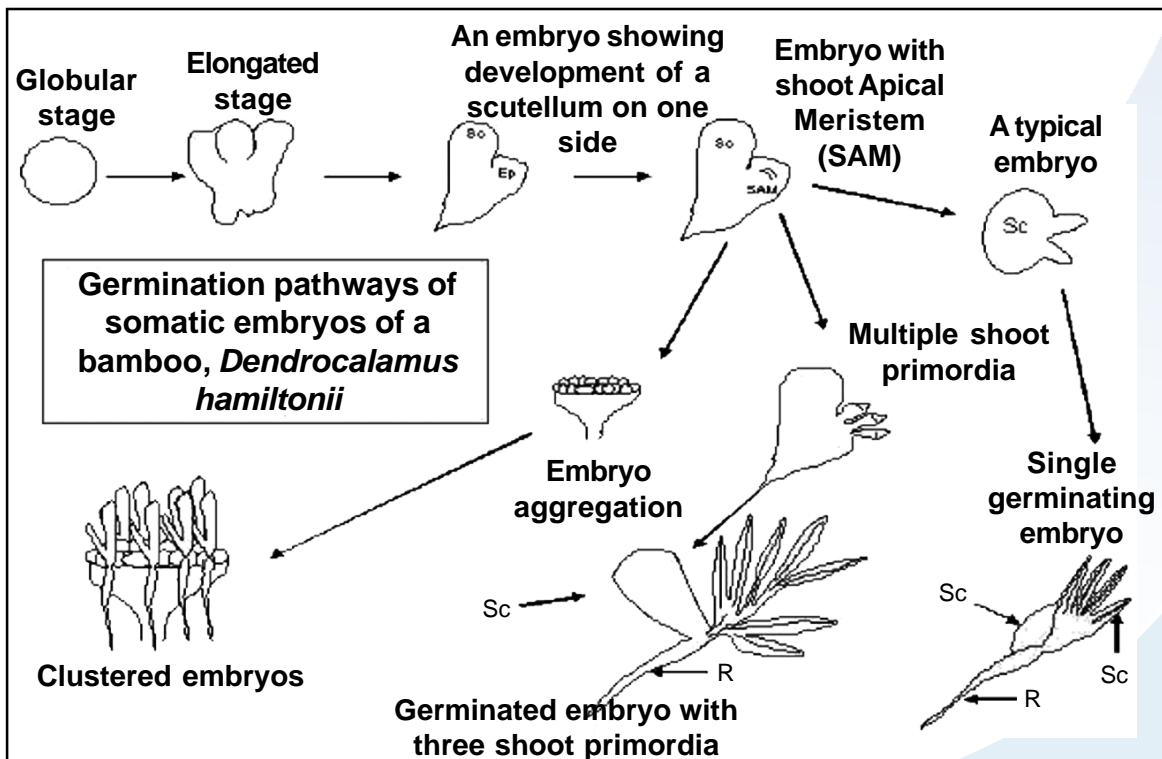
CSIR scientists working in the Institute of Himalayan Bioresource Technology (IHBT), Palampur have standardized the tissue culture techniques of bamboo. With this, large scale aseptic cultures of *D. hamiltonii*,

*D. asper*, *D. giganteous*, *Bambusa bamboos*, and *B. nudans* have been raised. Before mass propagation, selection of the seedlings in the field grown plants of *Dendrocalamus hamiltonii* was done through nodal explants *in vivo* as well as through tissue culture. The selections were based on the growth performance of the seedlings in the field conditions.

In the year 1990, scientists at the National Chemical laboratory (NCL), Pune, successfully attempted *in vitro* induction of flowering in bamboo using benzyl adenine (BA). This also helped scientists to understand the phase change in bamboo from juvenility to maturity at molecular level. A micropropagation protocol for *D. strictus* has been developed by NCL scientists using seedling explants. Using this cost-

effective protocol a large scale production of bamboo has been achieved for supplying this plant to different forest agencies, agriculture universities and private sectors. The technology know-how has been transferred to industry that includes hands-on training and consultancy for bamboo production. The S&T personnel from various Universities, private companies and Government organizations have also been provided training for adoption of this technology. NCL scientists are also working with various State Horticulture/ Forestry Departments, Agricultural Universities and Private Industries for establishing Tissue Culture Laboratories on a turnkey basis.

What's more is that efforts have been made for the assessment of genetic diversity of Indian bamboo germplasm





Culture initiation



Multiple shoots with roots



Rhizome induction

using the DNA fingerprinting technology. Besides, genetic transformation of select bamboo species is being attempted to create stress tolerant varieties for making the plant adaptable to a wider environmental conditions. Large scale planting materials of several edible bamboo like *Bambusa bambos*, *B. nutans*, *Dendrocalamus asper*, *D. hamiltonii*, *D. giganteous*, have been planted at IHBT and supplied to foresters of Himachal Pradesh, Uttaranchal bamboo and fiber board, Conservator of forest in Mizoram, and also in Arunachal Pradesh. It is now possible, through tissue culture methods, to supply large quantities of good quality bamboo planting material at reasonable costs. The scope of this technology is indeed vast in our country as India is home to some more than 100 species of bamboo.

As scientists found the rooting of micro-shoots inconsistent, they used an

alternative method namely, induction of somatic embryogenesis. They raised callus cultures in special media, containing specific growth hormones, that resulted in both fast growing as well as nodular and compact slow growing callus lumps. Various morphogenetic events leading to somatic embryo formation were then studied in detail through histological studies. For finding out the cells involved in callus induction, sections were cut both from the control explants showing no proliferation and the ones with cells proliferating at cut ends. Embryogenic masses were seen to appear in the callus tissue which eventually developed into full-fledged embryoids. The latter transformed into rooted plantlets, which were grown in the soil under greenhouse conditions.

Scientists have successfully demonstrated a similar procedure of multiple shoot formation and subsequent rooting of nodal explants of *B.*

*multiplex* and *B. ventricosa* in liquid media.

In one study, CSIR scientists conducted the large scale field collection, maintenance and raising the bamboo species, namely *Dendrocalamus hamiltonii*, *D. asper* and *Bambusa bambos* through nodal cuttings as well as tissue culture. About 11000 seedlings were collected from different locations in Kangra and Hamirpur where these species are predominantly growing. In yet another development, scientists established aseptic cultures of *Bambusa nutans* in special growth medium using nodal explants of branches of its field grown plant.

Thus, by employing the revolutionary technique of tissue culture CSIR scientists have been successful in rapid multiplication of a variety of bamboo species and the same is being attempted for many other plants to preserve the rich plant diversity of our country.



## NIO Signs MoU with Zhejiang Ocean University, China

The National Institute of Oceanography (NIO), Goa and the Zhejiang Ocean University, China have signed a Memorandum of Understanding (MoU) for joint research projects in marine biology, ecology, biotechnology, mariculture and coastal zone management. This maiden understanding is for a period of 5 years with scope and intent for renewal. The scientist coordinators for this long-term collaboration are Dr. N. Ramaiah and Prof. Wu Changwen.

The envisaged cooperation and consultation in the chosen areas will be accomplished through joint research proposals, researchers and information exchanges, access to research enabling instrumentation and an implementation committee comprising staff scientists and faculty from NIO and ZOU. ZOU's contribution to the local society and economy in China is through its academic-industry research model with emphasis on subject domain specialization and development. The University had won thrice the National Scientific and Technological Advancement Awards in the recent past and is among the three marine research and educational institutes in its province.

## MoU Signed Between NGRI, Hyderabad and IPGP, Paris

National Geophysical Research Institute (NGRI), Hyderabad and IPGP (Institut Physique du Globe de Paris) are the premier organizations of research in Earth Sciences in their respective countries. It has been a historical moment when the Directors of the two organizations signed an MoU on 4 February 2011 so that scientists of the two organizations could work together by exchanging ideas, information and knowledge in the field of Earth Science.

The MoU was signed by Prof. Claude Jaupart, Director, Institut Physique du Globe de Paris (IPGP), France and Dr. Y. J. Bhaskar Rao, Acting Director, NGRI, Hyderabad.

## Agreement Between CLRI and Bay Leather Company



CLRI recently signed an agreement with Bay Leather Company, Erode in connection with the preparation of Prefeasibility Report relating to erecting Bio-refinery plant with special focus on biodiesel recovery from leather product wastes.

## National Conference on, *Recent Advances in Ground Improvement Techniques*

A two days National Conference on, *Recent Advances in Ground Improvement Techniques* (RAGIT 2011) was organized by Central Building Research Institute (CBRI), Roorkee in association with Indian Geotechnical Society, Roorkee chapter on 24-25 February 2011 at CBRI, Roorkee.

Increased building construction activities and scarcely available suitable land, particularly in metropolitan cities, poses a challenge for Civil Engineers. This obviously, demands adoption of some suitable ground improvement techniques that are becoming favourable choices for the utilization of all types of grounds having weak sub-soil deposits. This becomes an essential need for construction of foundations of civil engineering structures. These project sites in the past have been rejected otherwise due to low bearing capacity.

During the recent decades many innovative techniques have been developed for ground improvement. Now, the present day demands to use even the land having poorest bearing capacity, such as the reclaimed land near seashores having marine clay etc. In such situations, rejection of project site becomes almost impossible. Few such ground improvement techniques popular in the present day practice



A book on Conference proceeding being released by the dignitaries

include – earth walls, stone columns, soil nailing, deep grouting, dynamic consolidations and many more. These are being applied to achieve significant savings in time, cost and effort. At the same time, adopting these techniques, civil engineers may convert these weak grounds to behave as per the design requirements for providing foundations with adequate safety. All such aspects require even more attention. This Conference was organized considering an important aspect – Ground Improvement.

The Conference was aimed at bringing together the design, research and practicing engineers working in the field of geotechnical engineering to foster and promote exchange of ideas on the recent advances in the field of ground improvement. The Conference themes were: Mechanical and Chemical Stabilization of Soil; Accelerated Consolidation of Clayey Soils; Deep compaction of Granular Soils; Soil Reinforcement; Grouting'

Thermal Stabilization of Soils; Deep Soil Mixing, Micropiles, Stone Columns, Granular Piles; Innovative Techniques in Ground Improvement; Evaluation of Ground Improvement and Environmental Aspects.

The Conference was inaugurated by Prof. Prem Vrat, former Director (IIT, Roorkee) & Former

Vice Chancellor (U.P. Technical University) as the Chief Guest. A Conference proceeding in the form of Book and CD on this occasion was also released. The Function was also graced by Prof. S. K. Bhattacharyya, Director, CBRI, Roorkee; Prof. Gopal Ranjan, Prof. K.S. Rao, President, IGS National Body. A number of National and International Experts from this field and academic front presented their papers. The six Keynote speakers invited were: Prof. Robert Liang (USA), Dr. V.R. Raju (Singapore), Prof D. M. Dewaikar (IIT, Bombay), Prof M. R. Madhav, Prof. Sarvesh Chandra and Prof. Basudhar (IIT, Kanpur). All speakers presented their papers and highlighted the field problems or experimental investigations carried out related to different aspects of Ground Improvement Techniques.

The research work being carried out during the recent few years was discussed in detail. Prof. Gopal Ranjan, Former IGS president and Chairman



delivered his theme-speech on this topic, whereas Prof. S. K. Bhattacharyya, appreciated the effort of IGS, Roorkee chapter to associate with CBRI to organize this National Conference on the emerging research area, which is the need of the present day. Prof. Prem Vrat, encouraged the Conference participants to work seriously in the near future on problems related to ground improvement. He was of the opinion that working out for various problems related to the theme would certainly be useful for building construction activity on the scarcely available land particularly in urban area of the country or land which is hardly suitable for construction of civil engineering structures.

The general opinion of all participants was that with rapid infrastructural development all over world and in India, civil engineers need to adopt some ground improvement techniques, particularly when the foundations are to be laid on weak sub-soil deposits before any civil engineering structure is constructed. This becomes more relevant in the present scenario when suitable lands are scarcely available and construction activities have to be carried out on weak lands.

Prof. K.S. Rao, Professor (IIT, Delhi) & President, IGS appreciated the initiative of IGS, Roorkee chapter for selecting such an important theme for this Conference. The Valedictory Function of the Conference was held on 25 February 2011. Prof. Prem Krishna, Chairman, Research Council, CBRI & former Head, Civil Engineering Department, University of Roorkee was the Chief Guest. Also present were: Prof. S K Bhattacharyya, Prof Rampal Singh and Dr. Pradeep Kumar.

The Organizing Committee comprised Prof. Ram Pal Singh, Dr. Pradeep Kumar (Organizing Secretary & Honorary Secretary, IGS Roorkee Chapter), Sh. A. Ghosh, and the faculty members from IIT Roorkee; Dr. V.A. Sawant, Dr. M.N. Viladkar, Dr. N.K Samadliya and Dr. M. Singh.

## IICB Organized International Symposium on, *Signaling Network and Cancer*



Seated on dais (from left) are: Prof. T. Kundu, Prof. A Dharmarajan, Prof. K. Sakaguchi, Prof. M Meuth, Shri A. Jha, Dr. R Mulherkar, Prof. S. G. Rhee and Dr. S. Zindge

The 30<sup>th</sup> Annual Convention of Indian Association for Cancer Research (IACR) and International Symposium on *Signaling Network and Cancer* was jointly organized by the Indian Institute of Chemical Biology (IICB) & IACR. It was held during 6-9 February 2011 at IICB, Jadavpur, Kolkata. The Symposium was also a part of the celebrations to commemorate the 75<sup>th</sup> year of IICB.

Scientists and clinicians from different countries, namely UK, USA, Japan, Canada, Australia, Singapore, Korea and India participated in the Conference. The inauguration of the Conference was held on 6 February 2011 in IICB Auditorium. Prof. Siddhartha Roy, Director, IICB delivered the Welcome Address. He expressed his pleasure as IICB co-organized this Conference along with IACR. He presented an excellent slide show about the glorious history of IICB and the region around it in science and education. He also portrayed the role of IICB in *Affordable Healthcare Through Modern Science* since its early days.

Dr. Rita Mulherkar, President, IACR in her address spoke about the activities of IACR in brief and extended her heartfelt congratulations and wishes in celebration of 75 years of IICB. Referring to the world cancer report, published by WHO, she said that the cancer rates will increase by 50% by the year of 2020. The report also mentioned that there is clear evidence that action on smoking, diet and infection can prevent almost one third of



Prof. S Roy, Director, IICB delivering the Inaugural Address



Prof. Gerry Mellino, MRC Laboratory, UK delivering his lecture

these cancers and another one third can be prevented or cured if detected early.

Dr. Tanuja Teni, Secretary, IACR focused on the organizational structure of IACR and its activities in detail. The Inaugural Session ended with Vote of Thanks from Dr. Susanta Roychoudhury, Scientist, IICB and Secretary, Organizing Committee. Dr. Roychoudhury mentioned that a meeting of such a stature where scientific minds across the globe come together requires an army of people to make it successful.

The scientific programme was enriched by oration lecture, keynote address, plenary lectures and student award lectures by national and foreign delegates. There were oral sessions and poster presentations too. More than 200 delegates participated in the Conference.

The four-day Conference comprised of 16 sessions including the inauguration and valediction. The IACR Presidential Oration Lecture, entitled, “*Cancer Biomarkers for Detection, Prognostication and Therapy*” was delivered by Dr. Rita Mulherkar, ACTREC, Mumbai. Keynote Address was presented by

Dr. Mammen Chandy, Director, Tata Medical Center, Kolkata whose topic was *From Bedside to Bench*.

One of the key features of the Conference was the interactive session between M. Pharm students of the National Institute of the Pharmaceutical Education and Research, Kolkata (NIPER) and eminent national and international scientists. Participants of the session witnessed a lively discussion of the students on the topics ranging from the opportunity of Indian scientists in anti-cancer drug discovery to the scope of pharmaceutical science students in scientific research in those areas.

In the Valedictory Session the distinguished delegates greatly appreciated the excellent scientific sessions of the Conference. They were impressed by the young students’ presentations, and appreciated the participation of a considerable number of clinicians. All participants expressed that the Conference was truly of International standard and hoped that collaborative research work would emerge with better therapies for cancer.

## INDO-US Workshop on, *Nanotechnology in the Science of Concrete at CBRI, Roorkee*

The INDO-US Workshop on ‘*Nanotechnology in the Science of Concrete*’ was held at Central Building Research Institute (CBRI), Roorkee in the recent past. The Workshop was jointly organized by CBRI and INDO-US Science & Technology Forum (IUSSTF), New Delhi. Uttarakhand State Council for Science and Technology (UCOST), Dehradun supported the Workshop. The objective of the Workshop was to arrive at appropriate direction of research in the area of concrete and possible collaborative activities between Indian and US institutions with industrial support in the area of concrete research with impetus on Nanotechnology.

Distinguished speakers from US and India participated and deliberated in the Workshop with their thought-provoking presentations and deliberations. Eminent speakers from the US included: Prof. S.P. Shah, Director, Centre for Advanced Cement Based Materials, Northwestern University, Illinois; Dr. Paramita Mondal, University of Illinois, Urbana Champaign; Dr. N. Neithalath, Clarkson University; Dr. Zachary C. Grasley, Texas A&M University and Prof. R. Panneer Selvam, University of Arkansas.



A view of the participants

The speakers from India were: Prof. B. Bhattacharjee, IIT, Delhi; Prof. Ananth Ramaswamy, IISc, Bangalore; Prof. Ravindra Gettu, IIT, Madras; Prof. Sudhir Mishra, IIT, Kanpur; Dr. Absar Ahmad, Scientist, NCL, Pune; Dr. Rakesh Kumar, Scientist, CRRI, New Delhi, Dr. Umesh Sharma, IIT, Roorkee. The Indian speakers representing the industry were: Dr. Subrato Chowdhury, Joint President, UltraTech, Mumbai and Dr. Chetan Hazaree, R&D Manager, HCC, Mumbai. The presentations from CBRI were made by Prof. S.K. Bhattacharyya, Director, Dr. L. P. Singh, Scientist (Workshop Coordinator) and Dr. P.C. Thapliyal, Scientist, CBRI.

The Workshop was divided into four thematic sessions viz.: (i) Synthesis & Modification of Materials at Nanoscale (ii) Nanoscale Characterization (iii) Design and Modeling of Materials Based on Nanotechnology and (iv) Performance Enhancement of

Concrete. The speakers made their presentations in the respective areas. Thematic group discussion was followed on the topics viz.: (i) Nanoscale Modification and Characterization (ii) Design and Modeling of Material at Nanolevel and (iii) Nanotechnology for Sustainable Development.

The two days presentations, brainstorming and discussion emerged out with the following futuristic goals:

- It clearly emerged out that to achieve ultra high strength and durable concrete, it is necessary to focus on the fundamental research with the applications of Nanotechnology in the area of concrete. It is essential to understand the behaviour of cement paste at nano level to obtain durable concrete material.
- To establish a research consortium amongst Universities and Institutions to promote and lead nanotechnology based concrete research. It is very

important to form a coalition of major research groups to generate knowledgebase.

- The consortium shall include experts on construction materials, materials scientist, computational modeling etc.
- To establish a website on key research progress and outcomes in the area of concrete with emphasis on nanotechnology. The website will also secure/establish a link amongst researchers during research in progress.
- To create a bilateral forum for interaction amongst S&T community of both countries to establish broader strategies.
- Creation of network of scientist, technologists and entrepreneurs to work together to promote joint research and development to foster the mutually beneficial innovation and entrepreneurship.



## CSIR Programme on Youth for Leadership in Science (CPYLS)

The CSIR Programme on Youth for Leadership in Science (CPYLS) is aimed at attracting the best school students towards science through a unique 'hand holding' experience. It aims at encouraging them to take science as an exciting, rewarding and fulfilling career. The CPYLS held at AMPRI, CSIO, NBRI and NEERI are highlighted here:

### Advanced Materials and Processes Research Institute (AMPRI), Bhopal



The Inaugural Function of CPYLS



Students interacting with scientists

CPYLS was organized during 1-2 February 2011 at AMPRI, Bhopal. A total of 121 students from M. P. Board of Secondary Education, Chhatisgarh Board of Secondary Education and CBSE of both the States participated in the two-days programme.

The Inaugural Programme began by lighting of lamp and recital of Saraswati Vandana. Padma Bhushan Dr. M.N. Buch, Former Chief Secretary, Govt. of M.P. was the Chief Guest. Shri Sewa Ram, Principal Secretary, Science & Technology, Govt of M.P, Shri Anurag Jain, Secretary, IT and PA to the Chief Minister, Govt of M.P. and Dr. V.K.

Singh, Director, Indian Institute of Science Education & Research, Bhopal were the Guests of Honour. Dr. Anil K. Gupta, Director, AMPRI welcomed the students, parents and the guests and Dr. R. K. Rawlley, Scientist conducted the programme.

Presentations were made by Dr. P. D. Ekbote, Scientist G, AMPRI, Dr. Ganesh, Sr. Scientist, Cancer Research Institute and Dr. Ajai, Principal Scientist, IISS, Bhopal. The students were exposed to different instruments, models, infrastructure and experiments at different institutions. A live demonstration at sub-zero

temperature was given to the students and their parents. The students were also taken for a field visit to municipal solid waste and plastic waste management centres and briefed by Dr. Rawlley and the concerned scientists.

The Valedictory Function began with the views of parents and students. It was followed by address of the Chief Guest, Dr. S.D. Kulkarni, Project Director, APPD, CIAE, Bhopal. Certificates were given away by the Chief Guest and Director, AMPRI. The Programme ended with the concluding remarks of Director, AMPRI and singing of the National Anthem.



## Central Scientific Instruments Organisation (CSIO), Chandigarh

The CSIR Programme on Youth for Leadership in Science (CPYLS) for attracting young and brilliant minds in science stream was inaugurated on 22 March 2011 at CSIO, Chandigarh. Meritorious students from the State of Haryana, who had scored distinction in Matric Examination from various Educational Boards in the year 2010 participated in this two-day programme.

Shri S.C. Choudhary, I.A.S. Financial Commissioner and Principal Secretary, Public Works Department, Govt. of Haryana was the Chief Guest on the occasion. While delivering the Inaugural Address, he called with nostalgia when he was in tenth class and was among the top ten students of Rajasthan Board. He said that although there was a lure of high salaries being offered by MNCs but the students should continue their quest for innovative research. He encouraged the students to improve their overall general knowledge by reading newspapers and listening to news on the radio and TV besides their regular studies. He said

that just as call centers have been outsourced to India, very soon R&D activities will also be outsourced which will open up new opportunities for us. He appreciated the efforts being made through the CPYLS programme to encourage the students to pursue science.

Dr Pawan Kapur, Director, CSIO in his Welcome Address informed that the basic purpose of CPYLS programme has been to motivate and attract young minds towards leadership in science. Dr Kapur elaborated on the possibilities offered by the fascinating world of science and the clue we can take from the wonders of Nature to develop scientific curiosity and inquisitiveness. He emphasized upon the need to opt for career in science, which gives fulfilment besides providing umpteen opportunities for self-growth while contributing to society. He encouraged them to pursue science as a career and welcomed them to begin their career with CSIR labs in pursuing their curiosity.

The students attended interactive sessions in which scientists from various research areas of CSIO discussed about their research, technologies and the upcoming trends. A multi-media Science Quiz Competition and Cultural evening was also organized for the participating students. During their two days stay at CSIO, students were taken around various labs of CSIO to apprise them about the actual environment of R&D labs. Students got an opportunity to closely interact with the researchers in various laboratories, where experiments were especially set up to help students understand the basic principles of how things work.

Popular science lectures by the scientists of CSIO were also arranged for the students to inspire and motivate them for developing a scientific temperament.

Shri A.D. Kaul, Senior Scientist proposed the formal Vote of Thanks. Shri N.S. Aulakh, Scientist, coordinated the Programme.

## National Botanical Research Institute (NBRI), Lucknow

The CPYLS Programme was inaugurated at the National Botanical Research Institute (NBRI), Lucknow by the Chief Guest Prof. H.N. Verma, Pro-Vice Chancellor, Jaipur National University, Jaipur. The main aim of the scheme is to expose the young minds to the exciting world of science, help in building up a scientific temper at an early age and instill a sense of pride in the achievements of Indian Science.

NBRI organized the CPYLS

Programme during 13-14 April 2011 for the toppers in the last CBSE, ICSE and UP Board examinations. A total of 30 merit holder students belonging to schools from Lucknow, Mau, Noida, Ghaziabad, Hamirpur, New Delhi, Bareilly and Muradabad participated in the Programme. Prof. H.N. Verma in his Inaugural Address narrated a brief outline of the importance of science for the improvement of our life. "It is the arduous efforts of our scientists like Prof.

M.S. Swaminathan that we have been able to increase the food production through green revolution and fulfilled the pressing demand of feeding our burgeoning populations," he said. He called upon the students to take up science as a career.

Prof. Verma illustrated by examples the great achievements of a number of eminent scientists like Dr. Srinivasa Iyengar Ramanujam – the great Indian mathematician, Nobel laureate Sir



Glimpses of the CPYLS Function at NBRI, Lucknow

C.V. Raman, Astrophysicist Prof. S. Chandrasekhar and Meghnad Saha, Prof. J.C. Bose, Dr. Vikram Sarabhai, Dr A.P.J. Abdul Kalam, Prof. M.S. Swaminathan and Dr. Verghese Kurien in taking forward India in many fields of science and technology. “For the progression of the country in every sphere, technology is needed and technology is nothing but the applied

aspect of science,” he remarked. He called upon the students that the youth have tremendous power of creativity and enthusiasm, which they should apply to the tedious, arduous and burning issues of the country for making it strong and prosperous nation of the world.

Earlier in his Welcome Address, Dr. C. S. Nautiyal, Director, NBRI welcomed the Chief Guest and other

dignitaries present on the occasion. In his address, Dr. Nautiyal congratulated the students and said that if we had to build our nation strong and self-dependent, then we have to develop our own innovations and technologies rather than relying on imitated or borrowed technologies. For achieving this, Dr Nautiyal

said that young scientists like the one in audience could excel and propel India in the field of scientific research and development in the coming years. Dr. J. K. Johri, Scientist and Coordinator compeered and briefly outlined the aims and objectives of the Programme. Dr. P.B. Khare, Scientist, NBRI proposed the Vote of Thanks.

## National Environmental Engineering Research Institute (NEERI), Nagpur

The two days ‘CSIR Programme on Youth for Leadership in Science (CPYLS)’ was organized by National Environmental Engineering Research Institute (NEERI), Nagpur on 30-31 March 2011. The Programme was attended by 10<sup>th</sup> (SSC) passed 40 meritorious students from various schools of Nagpur and the Vidarbha region along with their parents.

Dr. A K Joshi, General Manager, Regional Remote Sensing Service Centre (ISRO), Nagpur presided over the Inaugural Function as Chief Guest. Dr. Joshi while addressing the students and their parents said that for advancement of the country, students



Dr. A K Joshi, General Manager, Regional Remote Sensing Service Centre (ISRO) addressing the students; Seated on the dais (from left): Dr S R Wate, Director, NEERI and Mr. Prakash Kumbhare, Head, R&D Planning Division, NEERI

should develop innovativeness and creativity in basic science. It is essential to develop scientific temper among students, he advocated. He said that

such programmes definitely help students to interact with scientists and enhance their scientific temper. Dr. Joshi also briefed about various satellites which are sending data on Earth for several applications covering agriculture, water resources, urban development, mineral prospecting, environment, forestry, drought and flood forecasting, ocean resources and disaster management. Besides outlining the importance of ISRO, he also briefed about some of the latest R&D achievements that are useful for society.

Earlier, Dr. S R Wate, Director, NEERI in his Welcome Address said that the CPYLS Programme helps to build a

scientific temper at an early stage. He explained why science is important, why science should be chosen as a career and why science is exciting. He also mentioned that science and engineering together can only give rise to a new invention. He urged the students to adopt leadership in science for progress of the country. He encouraged the students for taking up R&D activities at the Institute in near future.

While giving an introduction of CPYLS Programme, Mr. Prakash Kumbhare, Coordinator of the CPYLS & Head, R&D Planning Division, NEERI said that the aim of organizing this Programme is to attract the best young students towards science through a unique 'hand-holding' experience. He stated that this Programme will encourage youth to discover science as

an exciting, rewarding and fulfilling career.

NEERI Scientists delivered popular science lectures on various environmental topics on this occasion. Dr. A. N. Vaidya, Scientist & Head, Solid & Hazardous Waste Management Division, NEERI briefed about various aspects related to *Solid and Hazardous Waste Management*. Dr. S. K. Goyal, Scientist, Air Pollution Control Division, NEERI spoke on *Air Environment*. Dr. G K Khadse, Scientist, Water Technology & Management Division, NEERI delivered a lecture on '*Water Environment*'. Dr. (Mrs.) Asifa Qureshi, Scientist, Environmental Genomics Division, NEERI spoke on *Environment and Genomics*. Dr. TVBPS Rama Krishna, Scientist, Environmental Impact & Risk Assessment Division, NEERI

briefed about various aspects related to *Atmospheric Science*. The students were taken to various NEERI laboratories to show them practical demonstrations on various significant activities related to environmental science and engineering. They were also taken to Raman Science Centre, Nagpur where they were briefed and demonstrated various scientific principles.

In the Valedictory Function, certificates were given by Dr. S. R. Wate, Director, NEERI to the participating students. The students and parents also expressed their thoughts, gave feedback about the Programme, and promised to avail R&D opportunity at CSIR in future. Mrs. Jaya Sabjiwale conducted the proceedings of the Programme.



Dr S. R. Wate, Director, NEERI delivering the Welcome Address



The participating meritorious CPYLS students from Nagpur and Vidarbha region



Glimpses of the CPYLS Function at NEERI, Nagpur



### IICB student Bags NASI Young Scientist Award 2010

Dr. Anindita Ukil, Ph.D. and Post-doctoral student of Indian Institute of Chemical Biology (IICB), Kolkata has been awarded the prestigious *Young Scientist Award* for the year 2010 in Biomedical Sciences by National Academy of Sciences (NASI). This Award is recognition for her excellent work on the dual role of the inducible isoform of nitric oxide synthase (iNOS) in macrophage biology in two disease models, visceral leishmaniasis and inflammatory bowel disease (IBD). She showed for the first time that up regulation of NF- $\kappa$ B plays a very important role in disease pathogenesis of IBD. She did her doctoral and post-doctoral research under the able guidance of Dr. Pijush K. Das, who is not only a scientist of eminence, but also a very good teacher. To her credit she has published nine major papers in noteworthy peer-reviewed journals, which attest to her hard work, biological insight, and outstanding writing skills.



Presently she is Assistant Professor, Department of Biochemistry, Calcutta University and working on negative regulatory pathways of macrophage—*Leishmania* interaction with special emphasis on identification of negative regulatory proteins by which *Leishmania* might turn off the signaling in phagocytic cells.

### Dr. Swaranjit Singh Cameotra Honoured

Dr. Swaranjit Singh Cameotra, Scientist F, IMTECH, Chandigarh was elected Fellow National Environmental Science Academy (FNESA). He had joined the Culture Collection in IMTECH in 1987. Dr Swaranjit was awarded based on his excellent work on Environmental Biotechnology, Culture Collection and Biodiversity. He is a recipient of the *Environmentalist Award* in December 2009. Dr. Swaranjit Singh is also a Member of World Federation of Culture Collections (WFCC) Task Groups.



### Nominations invited for Prof. G. N. Ramachandran Gold Medal for Excellence in Biological Sciences & Technology - 2011

The Council of Scientific & Industrial Research (CSIR) invites nominations for the *Prof. G. N. Ramachandran Gold Medal for Excellence in Biological Sciences & Technology -2011*. The Award is bestowed every year to an outstanding Indian scientist, who has made conspicuously important contributions, applied or fundamental, in the inter-disciplinary subject/field of Biological Sciences and Technology. The Award would be given for the work done primarily in India during ten years preceding the year of the Award. Nominations addressed to Head, Human Resource Development Group, CSIR Complex, Library Avenue, Pusa, New Delhi 110 012 should be sent as per prescribed proforma (Original + one copy) along with reprints of five most significant publications of the last 10-year's period by **30th June 2011**. The details of the Award and the prescribed proforma for nomination may be downloaded from our website <http://csirhrdg.res.in>



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