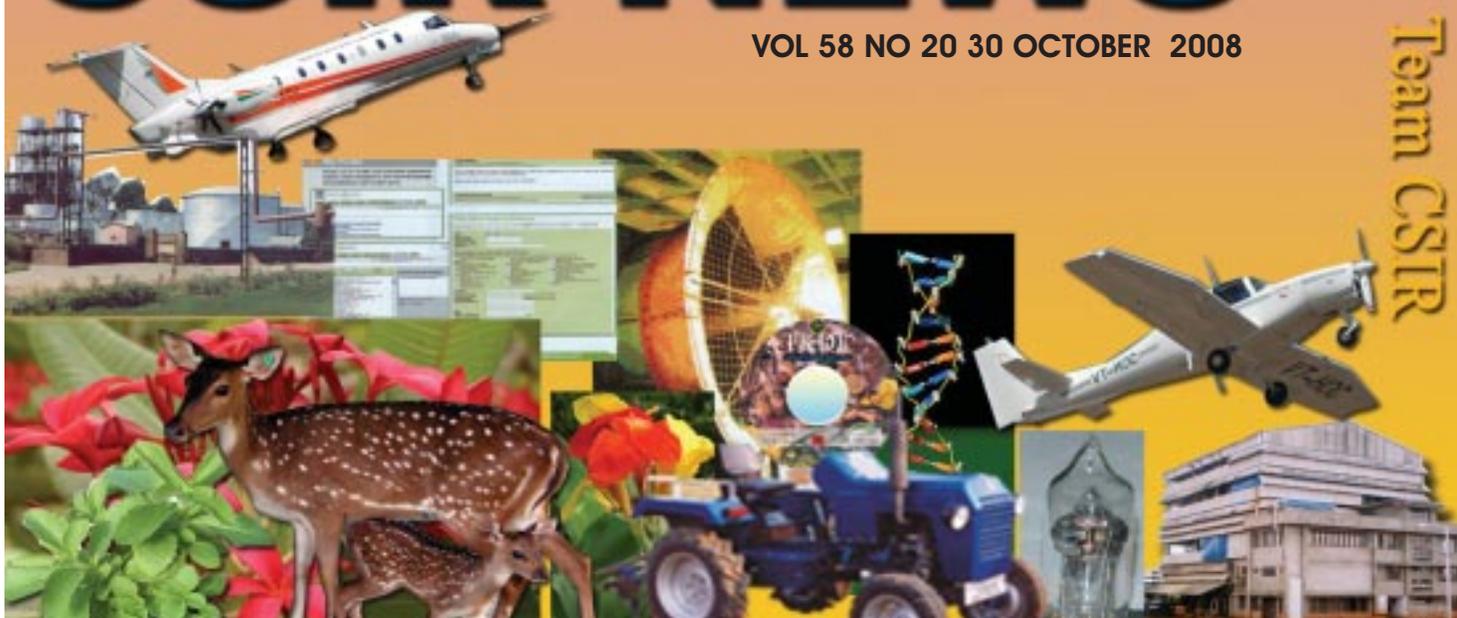


CSIR NEWS

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Team CSIR



CSIR Foundation Day Celebrations



Seen on the dais during the CSIR Foundation Day Function at NPL, New Delhi (from right) are: Prof. Samir K. Brahmachari, Shri Kapil Sibal, Prof. Bartha Maria Knoppers, and Dr Vikram Kumar

Founded in 1942, the Council of Scientific & Industrial Research (CSIR) celebrated its 67th Foundation Day on 26 September 2008. On this occasion the entire Team CSIR of 37 Institutes/Laboratories spread all over the country took stock of the progress made during the year that had gone by and planned for the future to serve the nation with still greater dedication. It was also an occasion to accord recognition to excellence in science through presentation of the various awards.

Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences and Vice President, CSIR, was the Chief Guest at the main function held in NPL. Shri Sibal addressed the

august gathering of Scientists and Technologists and gave away the various awards. Prof. Bartha Maria Knoppers, Faculte de Droit, University of Montreal and Senior Researcher at the Centre de Recherche en Droit Public (CRDP), Canada, delivered this year's foundation day lecture. The title of her lecture was "Investments in Health Research and International Interoperability". Prof. Samir K. Brahmachari, Director General, CSIR, extended a warm welcome and Dr Vikram Kumar, Director, National Physical Laboratory (NPL), New Delhi, proposed the vote of thanks.



CSIR Foundation Day Celebrations

The names of the winners of much coveted Shanti Swarup Bhatnagar Prizes and CSIR Award for S&T Innovation for Rural Development were announced and the winners of the CSIR Young Scientist Awards, CSIR Technology Awards and CSIR Diamond Jubilee

Awards for School Children were presented at the function that was marked by understated elegance and style.

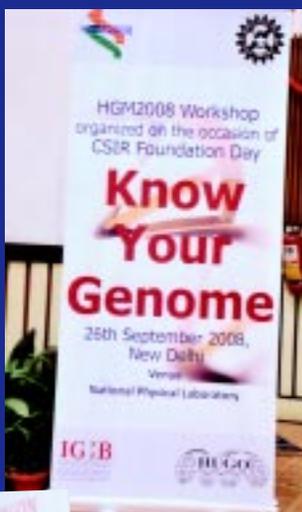
A workshop on 'Know Your Genome' was also organized at NPL for the high school and junior-college students.

The objective was to expose the younger generation to the current excitement in genomics sciences. The workshop was planned to coincide with CSIR Foundation Day and also to herald the opening of the Human Genome Meeting (HGM) 2008 at Hyderabad, an event which Prof. Samir K. Brahmachari, Director General, CSIR, chaired.

In his welcome address at the Foundation Day function Prof. S.K.

Brahmachari introduced the speakers. He recalled his long and fruitful scientific association with Prof. Knoppers. Referring to Shri Sibal as "Champion of Science, not only of CSIR but of the entire nation", he pointed out, "We have gathered here to celebrate the 67th birthday of CSIR and to recognize the outstanding S&T with awards at the hands of Shri Kapil Sibal." He, in particular lauded the efforts of young innovators, calling them "especial." "It was most befitting that CSIR should encourage and motivate young talents," Prof. Brahmachari remarked.

Prof. Brahmachari also mentioned that the workshop on "Know Your Genome", which had





concluded only a few minutes before the CSIR Foundation Day function was aimed to light a spark of intellectual curiosity in young minds. The workshop had the presentations entitled: "History and Future of the Human Genome" by Prof. Doron Lancet, Ralph & Lois Silver Chair of Human Genomics & Head, Crown Human Genome Center, Department of Molecular Genetics, Weizmann Institute of Science, Israel; "Making Eyes: From Disease to Development" by Prof. V. Heyningen, MRC Human Genetics Unit, Western General Hospital, Edinburgh, UK; and "Decoding Genetics of Tobacco Addiction" by Dr Stephen C. Ekker, Professor of Biochemistry and Molecular Biology, Mayo Clinic, Minnesota, USA.

Prof. Brahmachari was emphatic in his statement that CSIR stood not only for the Council of Scientific & Industrial Research but also for Council of Scientific and Innovative Research with Corporate Social Indian Responsibility."

Prof. Bartha Maria Knoppers began her lecture by quoting from *Science*, 15 August 2008 issue, which stated that India ranked third as the most attractive country location for new R&D facilities. Only China with 61%, and USA with 41% were ranked ahead of India (29.5%). Japan came in at fourth place with 14% and she wryly remarked that "my country (Canada) is not on the list!" Her talk highlighted that there are privately owned and state owned property but then there are also those property that fall in public domain. The public domain is a range of abstract materials –

commonly referred to as intellectual property – which are not owned or controlled by anyone. She elaborated on the Napoleonic Code for things in the public domain. Unknown to many, Napoleon's greatest contribution to society was the creation of a universal system of laws that replaced contradictory and antiquated provincial policies.

She spoke about the concept of "common heritage of mankind." It was recognized quite early that some things are common to all mankind and cannot be reduced to the property of an individual. For example, Grotius argued that "what cannot be seized or enclosed — such as the open sea cannot be reduced to property of individual states." Similarly the entire sky cannot be appropriated by a person or country. UNESCO in its 1997 Human Rights Declaration also upheld this concept albeit in a watered down way. It recognized human dignity when it stated, "The human genome underlies the fundamental unity of all members of the human family, as well as the recognition of their inherent dignity and diversity. In a symbolic sense, it is the heritage of humanity." The UNESCO Human Rights Declaration (1997) also guided the HUGO Ethics Committee.

She then moved on to speak about the next big step in facilitation of data-sharing. The international scientific community, with



Prof. Bartha Maria Knoppers delivering the CSIR Foundation Day lecture

particular efforts by the Wellcome Trust and the Sanger Institute, developed the Bermuda Principles in 1996 in response to the threat of fundamental genomic sequence data becoming proprietary to private companies. The Bermuda Principles advocated automatic release of sequence assemblies larger than 1kB (preferably within 24 hours), immediate publication of finished annotated sequences, and making the entire sequence freely available in the public domain for both research and development in order to maximize benefits to society. These actions were intended to allow researchers – academic and commercial – to make immediate use of the data. It was also hoped that early release of the data would lead to the prompt creation of 'prior art' that could potentially defeat patent claims based on similar DNA-sequencing efforts in the private sector.

This was followed by the Ft. Lauderdale Rules (2003) which basically underpinned the Bermuda Principles. The Ft. Lauderdale



principles stressed the rapid, pre-publication release of sequence data as a tremendous benefit to the scientific community that should be continued and extended to other large datasets.

The next important step that Prof. Knoppers outlined was the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003). This Declaration came about as a result of the scientific community's feeling of obligation to address the challenges of the Internet as an emerging medium for distributing knowledge. It was clear even then that the Internet was a powerful medium that would significantly alter the nature of scientific publishing.

"Open Source" is the new buzzword; the *mantra* of the times. Open Source is the ultimate source of benefit sharing. It is relevant in the current global context, and has perhaps arisen out of it, because stringent IPR rules are poised to boomerang—to lead to under-use of a resource—because it has been divided up amongst a number of owners who may not be willing to cooperate with one another. The costs associated with proliferating IP rights threaten to exclude all but the top-end players from shaping the direction of technological change. Open Source licensing is a style of intellectual property management that has evolved out of the Free Software movement, initiated in the early 1980s in response to restrictive copyright licensing practices adopted by commercial software developers. Biotechnology was quick to adopt the principles of Open Source of its own. It is clear

that the nature of research was slowly but definitely moving towards a collaborative and co-operative mode and into an area where previously strictly drawn boundaries (be it of subject, topic or even nationalities) were disappearing.

Meanwhile other trends were also becoming apparent, Prof. Knoppers continued. A study of the Emerging Trends in Ethics showed that there was a clear movement from Autonomy to Reciprocity; from Privacy to Mutuality; and from Equity to Universality. As Prof. Knoppers put it, "This past decade of discovery has been accompanied by a shift in emphasis towards the ethical principles of reciprocity, mutuality, solidarity, citizenry and universality." The emphasis was shifting towards public goods. Global public goods are those whose scope extends worldwide, are enjoyable by all with no groups excluded, and, when consumed by one individual are not depleted for others.

Prof. Knoppers spoke about The HUGO Ethics Committee that in its statement on Human Genomic Databases 2002, recognized:

- The potential global good arising from genetic research;
- The scientific and clinical uses of genomic databases;
- The potential for conflicts between the free flow of information that is crucial to research advances and the legitimate rights to return from research expenditure;
- The potential risk of misusing genetic data; and
- The need to rapidly place primary

genomic sequences in the public domain.

Prof Knoppers briefly touched upon the recommendations of the HUGO Ethics Committee. These included (amongst others) recommendations that:

- Human genomic databases are global public goods;
- Knowledge useful to human health belongs to humanity; Human genomic databases are a public resource;
- All humans should share in and have access to the benefits of databases;
- Individuals, families, communities, commercial entities, institutions and governments should foster the public good;
- Public engagement is a prerequisite of public responsibility;
- The free flow of data and the fair and equitable distribution of benefits from research using databases should be encouraged;
- Insofar as it benefits humanity, the free flow, access, and exchange of data are essential. Cooperation and coordination between industrialized and developing countries should be facilitated;
- Repositories should be established and funded to ensure the continuation of publicly available databases;
- Compatibility should be fostered through the use of common nomenclature, and, where possible, the pooling of databases should be encouraged;
- The choices and privacy of individuals, families and



- communities should be respected;
- Prior consideration should be given to the possible negative socio-economic effects, if any, of the collection, sharing, and publishing of the data;
- Researchers, institutions, and commercial entities have a right to a fair return for intellectual and financial contributions to databases;
- There should be reciprocity and exchange of information with fair return (for example, non-exclusive licenses, copyright, monetary, non-monetary – like publication or credits), database pools, and central repositories.

Prof. Knoppers gave a brief insight into the exciting “race” that the human genome sequencing effort turned out to be. It was a race between the company Celera Genomics (headed by Craig Venter) and the publicly funded Human Genome Project. Finally a high-quality, “finished” sequence of the human genome was completed in 2003 with Celera Genomics placing some information in the public domain.

Prof. Knoppers also elaborated on The Public Population Project (P³G), which is a non-for-profit international consortium to promote collaboration between researchers in the field of population genomics. It was launched to provide the international population genomics community with the resources, tools and know-how to facilitate data management for improved methods of knowledge transfer and sharing. Its main objective is to create an open, publicly accessible knowledge database. The motto is transparency

and collaboration.

The use of a consortium like P³G was demonstrated by The Human Genome Project and the International HapMap Project where global collaboration was the key to success. The generation of a wealth of reports regarding susceptibility genes has created the need to generate large well-characterized data sets from population-samples. These studies will allow the biomedical community to unravel the complex genetic and environmental interactions responsible for most common diseases. The P³G serves as an international consortium for the development and management of a multidisciplinary infrastructure for comparing and merging results from population genomic studies. It enables international research communities to deliver more effective healthcare strategies aimed at disease prevention, and at personalizing treatment regimens.

It was clear from Prof. Knoppers’ talk that collaboration and cooperation were the only productive ways forward as far as the scientific community was concerned. This was the way the fruits of science could be delivered to the common man at an affordable cost.

Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, in his speech began by greeting the Award Winners. Shri Sibal’s speech highlighted the advances in scientific R&D and also focused on the new trend that is Open Source; a collaborative way of making progress. He said that he was, “excited by science and

research moving forward at such a pace and by the perceptible change in thought as we go forward into the 21st century.” He expressed great amazement at all that Genomics is doing for us by moving us into an era where “R&D and business model in healthcare is changing.” He was appreciative of the fact that there was a sharp change in the way science is being done. The trend is “towards sharing of knowledge.” He expressed his delight at Prof. Knoppers’ speech and emphasized that “Our genetic make-up is the heritage of mankind.” A person’s genome is “individualistic” because it belongs solely to one individual. But it is also part of the common heritage of all mankind. Thus there is a need for a balanced outlook when dealing in genomes. There is the need to balance the individual’s right with respect to his own genetic material with the society’s right to use it for the good of mankind. It follows therefore, “That we have to change the business model too. Because if after multi-billion dollar R&D, the ultimate medicine is unaffordable, there is no use of the research. If 21st century healthcare problems are to be resolved, we have to change the existing R&D healthcare model,” he stressed.

In this context, Shri Sibal congratulated Prof. Brahmachari for launching Open Source Drug Discovery (OSDD) targeted at Tuberculosis. He said, “We know that there is a wealth of knowledge dispersed around the world on cancer, on TB, on Autism, on Alzheimer’s, etc., but there is no platform to share the knowledge.” He praised the OSDD platform and



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commented on the importance of such Open Source platforms that allow scientists to share. He added “This does not mean that multinationals should not make money or that individuals must not get patents. But sharing of ideas and knowledge come first. With cross-fertilization of ideas come solutions.”

Then, of course, Venture Capitalists are encouraged to invest because they sense this is a winning, marketable and profitable solution. They will invest only when ideas can be turned into products.

Shri Sibal said that India is the third most-favoured R&D destination today, thanks to the scientists at the helm of affairs and with their efforts bearing fruits, brains that had left India are returning too.

The 37 CSIR laboratories have a wealth of information. They need to “address the issue of free flow—this is at the heart. We must think how to have free flow of ideas and information across 37 laboratories (of CSIR) and then move forward, the Open Source way to (cover) the world,” Shri Sibal said.

Shri Sibal pointed out that

because of their “peculiar policies” multi-nationals neglect certain drugs/diseases but we could find an answer the OSDD way. He cautioned about “huge ethical issues” as we moved forward and mentioned stem-cell research as an example. He also pointed out the need to develop stronger linkages with industry. He said that while science developed well in CSIR, the linkages with industry needed strengthening. “Open Source is a wonderful platform to develop linkages and working with industry is rewarding always as solutions come,” he said, citing the Green leather technology developed by Central Leather Research Institute (CLRI), Chennai, as a case in point. He called this an example of Public Private Partnership at its best, saying that without sharing there is no solution.



Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, delivering his speech

He praised the Soleckshaw—solar operated rickshaw, designed by CSIR, as an example of a “solution for the people.”

He exhorted CSIR to address to the needs of the people by creating a roadmap for solutions for the 800 million poverty-stricken Indians.

In his concluding comments Shri Sibal said, “Science is for the people, It is not meant to sit in labs. There is no point if you do not have solutions for the people. CSIR must have solutions for the people.”





SHANTI SWARUP BHATNAGAR PRIZES: 2008

Instituted in 1957, the Shanti Swarup Bhatnagar Prizes are the most coveted S&T Prizes in the country. These prizes, each carrying a cash award of Rs 200,000, a citation and a plaque, are awarded annually for notable and outstanding research, applied or fundamental, in (1) Biological, (2) Chemical, (3) Earth, Atmosphere, Ocean and Planetary, (4) Engineering, (5) Mathematical, (6) Medical and (7) Physical Sciences. Any citizen of India engaged in research in any field of Science and Technology, who is not more than 45 years old on 31 December of the year preceding the year of the Prize, is eligible. He/she should have made, in the opinion of CSIR, conspicuously important and outstanding contribution to human knowledge and progress – fundamental or applied – in the particular field of endeavour, which is his/her specialization. The prize is awarded on the basis of contributions made through work done primarily in India during the five years preceding the year of the prize.

Ten scientists have been selected for the Shanti Swarup Bhatnagar Prizes for the year 2008:

Biological Sciences

Dr Gajendra Pal Singh Raghava
Head, Bioinformatics Centre
Institute of Microbial Technology
Sector - 39A
Chandigarh 160 036

and

Dr L. S. Shashidhara
Centre for Cellular & Molecular
Biology
Hyderabad 500 007

Chemical Sciences

Dr Pradeep Thalappil
Department of Chemistry
& Sophisticated Analytical
Instrument Facility
Indian Institute of Technology
Chennai 600 036

and

Dr Jarugu Narasimha Moorthy
Department of Chemistry

Indian Institute of Technology
Kanpur 208 016

Earth, Atmosphere, Ocean and Planetary Sciences

Dr P. N. Vinayachandran
Centre for Atmospheric
and Oceanic Sciences
Indian Institute of Science
Bangalore 560 012

Engineering Sciences

Dr Ranjan Kumar Mallik
Department of Electrical
Engineering
Indian Institute of Technology
New Delhi 110 016

Mathematical Sciences

Dr Jaikumar Radhakrishnan
School of Technology & Computer
Science
Tata Institute of Fundamental
Research

Homi Bhabha Road,
Mumbai 400 005

Medical Sciences

Dr Ravinder Goswami
Department of Endocrinology &
Metabolism
All India Institute of Medical
Sciences
New Delhi 110 029

Physical Sciences

Dr Raghunathan Srianand
Inter-University Centre for
Astronomy & Astrophysics
Ganeshkhind,
Pune University Campus
Pune 411 007

and

Dr Srikanth Sastry
Theoretical Sciences Unit
Jawaharlal Nehru Centre for
Advanced Scientific Research
Bangalore 560 064



CSIR AWARD FOR S&T INNOVATIONS FOR RURAL DEVELOPMENT - 2008

jointly won by

**Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow
and**

Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar

CSIR had instituted in 2006, “CSIR Award for S&T Innovations for Rural Development” to recognize and honour S&T innovations that have helped transform the lives of rural people. The award carries a cash prize of Rs 10 lakh, a citation and a shield.

Prof. Samir K. Brahmachari, Director General, CSIR, announced bestowing of the CSIR Award for S&T Innovations for Rural Development (CAIRD) - 2008 jointly upon Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow for “Biovillage strategy for agri-business of Medicinal and Aromatic Plants” and Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar, for “Innovations in the area of salt for rural development”.

Providing details on the innovations made by both the institutions, Prof. Brahmachari mentioned that shrinking land holdings, decreasing productivity of Indian soils and increasing input costs to agriculture are resulting into diminished returns from conventionally grown crops. The backbone of Indian economy, the traditional agriculture is gradually proving to be uneconomical. There

is a felt need thus to improve strategically the agri-economics for rural farmer. This is possible only by augmenting and introducing some economically viable specialty crops along with the traditional agricultural crops. CIMAP has gainfully utilized Medicinal and Aromatic Plants (MAPs) for this purpose by conceptualizing “Biovillage Mechanism” and operationalizing it strategically. Varieties and agrotechnologies of MAPs have been developed and disseminated, aiming at sustainable production and commercialization of these plants in rural areas. This has helped in economic upliftment of farmers in a big way.

CIMAP has backed the concept of Biovillages by developing several new cultivars of mint, artemisia, geranium, patchouli and khus suiting to diverse agro-climates.

Linkages with industry have also been established for necessary buy back of the produce from farm itself thus benefiting farmers directly. A dependable complete package for managing distillation waste, farm waste, weed waste, etc. has also been developed and integrated to generate biofertilizer. CIMAP’s Biovillage Concept has

inputs of end-to-end innovation for benefit of rural farmers.

Explaining the CSMCRI innovation, Prof. Brahmachari said that out of the total 20 million tonnes salt produced in the country annually, about 6 million tonnes is produced in the rural sector by the marginal salt producers. The salt produced by marginal salt manufacturers is of inferior quality owing to the presence of higher amounts of certain ionic impurities and other insolubles. The rural manufacturers also lack scientific knowledge of salt manufacturing. Thus, this type of salt fetches very low price.

CSMCRI has developed various processes for the recovery of high purity salt by rural salt producers addressing the problems faced by the rural salt manufacturers. Processes for removal of impurities through heap washing and desulphatation, utilizing distiller waste liquor of soda ash plants, which otherwise poses the problem of disposal and creates environmental pollution, have been developed. CSMCRI has specifically taken care that no additional time or infrastructure is required to implement the processes



developed and significant improvements in salt purity and whiteness are brought about. With CSMCRI's innovation, even rural salt producers are producing salt of purity > 99.5% and whiteness index of 87-91. Rural salt producers of Gujarat, Rajasthan and Orissa have been greatly benefited from these efforts. Further, CSMCRI innovations have enabled the rural salt producers to enhance their income by many folds. Being easy to adopt, eco-friendly and cost effective, these innovations can be implemented without any risk in any rural salt works irrespective of the source of brine and the type of salt works.

Prof. Brahmachari hoped that bestowing of CAIRD-2008 jointly upon CIMAP and CSMCRI would inspire scientists engaged in the profession and business of innovation, particularly aimed at rural development in the country, to accelerate their efforts of innovating on one hand and implementing them successfully at ground level on the other. The livelihood of our rural brethren would be elevated and transformed in a sustainable and gradual manner this way, elaborated Prof. Brahmachari. These efforts would also build a newer form of support to Indian economy, he added.

CSIR YOUNG SCIENTIST AWARDS 2008

Introduced in 1987, these awards are open to scientists working in CSIR system who have not attained the age of 35 years by 26 September of the preceding year. The awards are given annually for outstanding contributions made by the young scientists, based on work done primarily in India, in the following fields: Physical Sciences (including instrumentation); Chemical Sciences; Biological Sciences; Engineering Sciences; and Earth, Atmosphere, Ocean and Planetary Sciences. The scientist should be a regular employee of CSIR, holding a post of Group IV (Scientist 'B' or above) and should have joined the CSIR laboratory on or prior to 26 September of the previous year. The awards carry a citation, a plaque and a cash prize of Rs 50,000 with a grant of rupees ten lakh spread over a period of five years for pursuing research project independently.

The recipients of the CSIR Young Scientist Awards for the year 2008 are as follows:

Biological Sciences

Dr Beena Pillai, Transcriptomics, Institute of Genomics & Integrative Biology, Delhi

Dr Pillai is one of the first young investigators in the country, who have successfully applied microarray technology in gene expression profiling in different system. This would eventually help in understanding human diseases.

Chemical Sciences

Dr Subhash Ghosh, Bioorganic Laboratory, Organic Chemistry III, Indian Institute of Chemical Technology, Hyderabad

and

Dr Melepurath Deepa, Electronic Materials Division, National Physical Laboratory, New Delhi

While Dr Ghosh has been awarded for his contributions to the total synthesis of biologically active natural products, Dr Deepa received the award for her contribution to the development of electrochromic films and devices.

Engineering Sciences

Dr Satyajit Vishnu Shukla, National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram

and

Dr Ranjan K. Sahu, MST Division, National Metallurgical Laboratory, Jamshedpur

Dr Shukla has been awarded for development of hydrogen sensors and separation techniques, and Dr Sahu, for the development of magnetoresistive materials.



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Earth, Atmosphere, Ocean & Planetary Sciences

Dr Sinai Khandeparker Lidita Dilip, Marine Corrosion & Materials Research Division, National Institute of Oceanography, Goa

and Dr Simanchal Padhy, Department of Seismology, National Geophysical Research Institute, Hyderabad.

Dr Lidita Dilip has been awarded for her studies to elucidate the interactions between chemical signals transmitted by bacteria and settling larve of fouling organism in marine environment. Her researches led to the detection of fungoid microorganism in natural biofilm.

Dr Padhy has been awarded for his significant contributions to seismic anisotropic structures and attenuation of body waves in relation

to understanding geological complexities.

Physical Sciences

Dr Pankaj Poddar, Physical & Materials Chemistry Division, National Chemical Laboratory, Pune

Dr Poddar has been awarded for his excellent work on biosynthesis of magnetic and ferroelectric nanoparticles.



CSIR Young Scientist Award-winners with Shri Kapil Sibal, Prof. Samir K. Brahmachari, Prof. Bartha Maria Knoppers and Dr Vikram Kumar



Release of *CSIR: Making Pathways into New Frontiers with a Human Face* — The profusely illustrated publication highlights the CSIR's Yeoman service into the various socio-economic and strategic sectors



CSIR TECHNOLOGY AWARDS 2008

Instituted in 1990, 'CSIR Technology Awards' seek to foster and encourage in-house multidisciplinary team efforts and external interaction for technology development, transfer, marketing and commercialization. These awards are given annually in different categories, each carrying a cash prize of Rs 2 lakh, a plaque and a citation.

For the year 2008, three awards out of the available five were given, following a very stringent criterion so as to maintain high standards set for the awards. They are in the category of "Life Sciences", "Innovation" and "Business Development & Technology Marketing".

The Technology Award in Life Sciences goes to Centre for Cellular

and Molecular Biology (CCMB), Hyderabad for developing novel universal technique to establish the identity of enormous number of animal species for forensic applications.

The developed technique is based on polymerase chain reaction (PCR), which without knowing the history of a forensic sample, is able to reveal whether the source of the sample is human or animal, and if animal which animal. The technique is simple and uses one set of novel primers to amplify and sequence the PCR amplicons. The molecular technique can be applied universally with a tiny piece of meat/drop of blood or even a single hair originated from any of the thousands of species of animals including any of the threatened and/or

endangered animal. International patents have been obtained for this innovation.

The team comprises Dr Lalji Singh and Dr Sunil Kumar Verma.

The Technology Award for Innovation has been given to Central Drug Research Institute (CDRI), Lucknow, for discovery of guggulsterone and development of analogues with novel mechanism of action as hypolipidemic agent.

The innovation involves development of a potent lipid lowering formulation to fight the widely prevalent metabolic syndrome encompassing hyperlipidemia, insulin resistance, diabetes and hypertension. The developed Guggulsterone has been isolated from the resin of *Commiphora mukal*, a product earlier developed by CDRI.

Several structural analogs of Guggulsterone have been designed and synthesized following lead from Gugulipid. The most active Guggulsterone analogue has undergone appropriate biological profiling through regulatory pharmacology, toxicity and pharmacokinetics. Phase III multi-centric clinical trials for efficacy



Team members of CSIR Technology Award-winners from CCMB, CDRI and URDIP



evaluation in patients of hyperlipidemia are under progress in collaboration with Cadilla Pharma, Ahmedabad. CDRI has secured several patents on the development.

The Technology Award for Business Development & Technology Marketing goes to Unit for Research and Development of Information Products (URDIP), Pune, for creating the niche in the knowledge based service sector. URDIP has designed, developed and provided value added information services in the areas of Patinformatics, Phytoinformatics and Toxininformatics.

URDIP is involved in the pre-research and pre-development phase of the research projects. The output of URDIP's services is used by clients to identify new emerging applications, new directions for product development, discover trends in competing technology approaches and competitor watch. These studies enable companies to drive their research strategy and innovation.

Over the years, URDIP has acquired an excellent stature in Patinformatics and these services are sought by several research institutions, small, medium & large enterprises and multinationals. URDIP has registered a sustainable commutative growth of over 65% in the last three years.

CSIR DIAMOND JUBILEE INVENTION AWARDS FOR SCHOOL CHILDREN

In order to enhance creativity amongst school children, CSIR announced for the first time Diamond Jubilee Invention Award for School Children on 26 April 2002 – the day celebrated as World Intellectual Property Day throughout the world. The objectives of these awards are: to capture creativity and innovativeness amongst school children and create awareness about IPR.

There are a total of 60 awards to be given each year. The first prize winner becomes eligible for WIPO's Young Inventor's Award carrying a medal and a certificate besides cash prize of Rs 50,000/-

During the last five years, i.e. from 2002 to 2007, about 2221

proposals were received for these awards from various parts of the country and 41 inventions were selected for various prizes by a High-level Awards Selection Committee.

During the year 2007, only two inventions — one for the Third Prize of Rs 15,000 and the other for a Consolation Prize of Rs 5000/- were selected out of 223 proposals received for these awards, and these were presented on the CSIR Foundation Day-2008

The Third Prize of Rs 15,000/- has been awarded to **Miss Neha Lalit Sharma**, student of Class X of FR. Agnel Multipurpose School, Vashi, Navi Mumbai, for her invention "Herbal formulation to control Brown Dog Tick". The inventor has



Winners of CSIR Diamond Jubilee Invention Award for School Children with Shri Kapil Sibal, Prof. Samir K. Brahmachari, Prof. Bartha Maria Knoppers and Dr Vikram Kumar

utilized common and freely available plants like castor, custard apple and tobacco for controlling brown dog ticks (*Rhipicephalus* spp.) The activity is enhanced in presence of mahua butter base, augmented by shikakai wash. The formulation provides an eco-friendly, economic, and efficacious solution to the problem.

Consolation Prize of Rs 5,000/- has been awarded to Master Shikhar Bhandari of class XI of B.V.B Mehta Vidyalaya, K.G. Marg, New Delhi, for his invention "Multiple use of a two-wheeler scooter". This invention relates to modified two-wheeler useful as electrical generator, water pump, air compressor and crop threshing unit. A pulley is fixed at the side of the engine, near the kick start pedal. Fan belt is fixed to the pulley and attachments like generator, water pump. Accelerator knob is used to get the rpm of the engine according to the requirement. The electricity generated by the scooter engine can be useful in extreme and remote areas.

CMERI-developed solar rickshaws, Soleckshaw, launched in Delhi



Union Minister of Science and Technology Shri Kapil Sibal and Delhi Chief Minister Smt. Sheila Dikshit riding a solar-electric rickshaw after launching it in Delhi

The Central Mechanical Engineering Research Institute (CMERI), Durgapur, developed solar cycle rickshaws – the green rickshaw, named **Soleckshaw**: which was launched in Chandni Chowk in Delhi on 2 October 2008, the birth anniversary of Mahatma Gandhi. The inaugural ceremony was attended by Delhi Chief Minister Smt. Sheila Dikshit, Union Science & Technology Minister, Shri Kapil Sibal, and CSIR Director General Prof. Samir K. Brahmachari.

Lauding the development of Soleckshaw, Shri Kapil Sibal said, "There is a need for urban transport

which is comfortable and affordable for the poor. *Soleckshaws* will be their Nano."

Ms Sheila Dikshit observed, "It is a sturdy mode of transport which functions on clean energy."

Weighing about 210 kg each, this green rickshaw is able to run at a speed of 15 to 20 km per hour. Designed by CMERI in eight months, these rickshaws are battery operated. "The battery that is inbuilt is charged by solar energy. The energy is transmitted to a gear system which moves the three wheels of the rickshaw. Though pedaling is not required, if pedalled, Soleckshaw will gain power," said A.



Roy, who was part of the team that developed the rickshaw.

It is a redesigned version of the ubiquitous cycle rickshaw, which is equipped with a robust low-power high-torque brushless DC motor developed by Crompton Greaves on specifications provided by CMERI.

The battery re-charge station, comprising a central control panel, has been set up near the Chandni Chowk Metro Station and a rickshaw puller will be given an alternative battery while his battery is being recharged. It will cost Rs 45 to get the battery re-charged, which can run till 70 km before dying out. Initially introduced as a pilot project in Chandni Chowk, to ply within a radius of 3 km from the Metro Station, these will be later introduced in other areas of the city.

Speaking on the occasion, Prof Samir K. Brahmachari, Director General, CSIR, said, "The advanced versions of the Soleckshaws will have better aesthetics and a speed of 15 kmph and will be ready for a full-fledged launch before the Commonwealth Games 2010. This pedicel is easy to drive on plain as well as uphill roads". The Soleckshaws were earlier flagged off at Durgapur on 17 August.

Prof Brahmachari further said, "The designs of the rickshaws can be copied by anyone, but quality control will be done. We hope that the cost of the rickshaws is around the same as that of the current rickshaw at Rs 7000 as we will earn carbon credits for them."

"Soleckshaw is robust and ergonomically designed to take the drudgery out of rickshaw pulling", remarked Dr Gopal Sinha, Director, CMERI. CSIR is also looking at possibilities of modifying the rickshaws plying currently so that they can be made battery operated.

High Pressure Raman Spectroscopic Facility and Recent Studies on Rare Earth Sesquioxides Ln_2O_3 (Ln = La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Y) at NPL

Over the last few decades physics of solids under high pressure and associated phase transition properties of several types have emerged as a new dimension of research in condensed matter. Use of such tools in reducing the volume by compression has been currently developed due to sophisticated high pressure instrumentation like diamond anvil device (DAC) and other techniques. The Pressure and Vacuum Standard Group of the National Physical Laboratory (NPL), New Delhi, has established High Pressure Raman Spectroscopic Laboratory which has a low-cost Laser Raman Spectrometer with Micro Raman Facility (Shown in Fig. 1) and DAC (Shown in Fig. 2) which generate the high pressure.

The basic objective of this set-up is to understand the phenomenon taking place under high pressure like pressure-induced phase transition, modification in electronic and phonon properties of matter, etc. During the last two years, the group is concentrating on investigating the vibrational, structural, electronic and phonon properties of rare earth oxides (Ln_2O_3) under high pressure.



Figure 1: A low-cost Raman Spectrometer with Micro Raman attachment

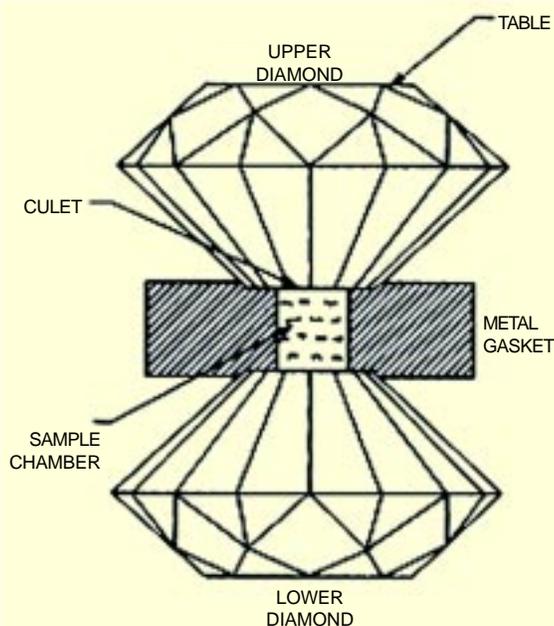


Figure 2: Diamond anvil cell (DAC) for generating high pressure

The rare earth sesquioxides Ln_2O_3 (Ln = La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Yb, Y) have a significant role in the industry because of their potential use as phosphorus for improved cathode luminescence and in lasers as optical thin films and also as control rods in nuclear reactors. These are also used as protective and corrosion resistant coatings due to their wide range of thermal stability.

The Ln_2O_3 are known to exist in three polymorphic forms: A . hexagonal, B. monoclinic, and C. cubic. It is known that as the pressure increases, there is a decrease in volume per mole of Ln_2O_3 which undergoes C-cubic modification to B-monoclinic modification to A-hexagonal modification. In contrast, recent studies on yttrium sesquioxide (Y_2O_3), gadolinium sesquioxide

(Gd_2O_3) and samarium sesquioxide (Sm_2O_3), under high pressure show very peculiar results.

For example, the samples Y_2O_3 and Gd_2O_3 were found to be cubic at ambient, while Sm_2O_3 was found to be predominantly cubic with a small fraction of monoclinic phase. Y_2O_3 seems to undergo a crystalline to partial amorphous transition when pressurized up to about 19 GPa, with traces of hexagonal phase (Fig. 3). However, on release of pressure, the hexagonal phase develops into the dominant phase. Gd_2O_3 is

also seen to develop into a mixture of amorphous and hexagonal phases on pressurizing. However, on

release of pressure Gd_2O_3 does not show any change and the transformation is found to be irreversible.

On the other hand, Sm_2O_3 shows a weakening of cubic phase peaks while monoclinic phase peaks gain intensity up to about a pressure of 6.79 GPa. However, thereafter the monoclinic phase peaks also reduce in intensity and mostly disordering sets in which it does not show significant reversal as the pressure is released. The details of these very interesting results have been published recently.

Many other strategically interesting materials have also been studied by the group in close collaboration with BARC (Mumbai), IGCAR (Kalpakkam) and Universities of Jaipur and Bhopal.

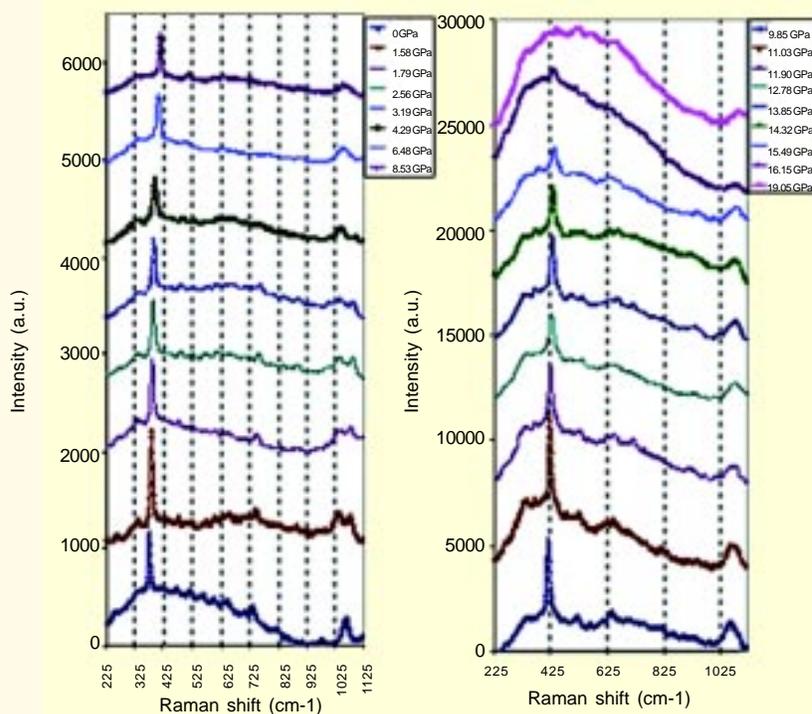


Figure 3: Raman spectra of Y_2O_3 plotted with increase in pressure



Meeting on Sensors/Instrumentation for Water Pollution: Physical, Chemical and Biological: Detection and Mitigation

A Department of Science & Technology (DST)- sponsored cluster of projects' meeting on 'Sensors/Instrumentation for Water Pollution: Physical, Chemical and Biological: Detection and Mitigation' was organized at the National Environmental Engineering Research Institute (NEERI), Nagpur, in the recent past. DST has been promoting the area of instrumentation through its Instrumentation Development Programme (IDP). The programme focuses on strengthening indigenous capability for research, design, development and production of instruments in the country leading to fulfillment of the following objectives:

- Indigenous development and production of instruments;
- Continuous updating of the technology of instruments to keep pace with technology improvements taking place globally; and
- Innovations in the area of instrumentation.

In the meeting, Prof. E.S.R. Gopal, Chairman, IDP Committee, briefed about the role of the committee in organizing the cluster of projects meeting in different



Dr Tapan Chakrabarti, Acting Director, NEERI, speaking at the inaugural session of the DST sponsored cluster of projects meeting. Seated on the dais (from left): Dr (Mrs) Neeta Thacker, Prof. E.S.R. Gopal and Mr Chander Parkash

areas of sensor technology. He also explained about novel ideas to invite project pre-proposals from potential project investigators (PIs) and to provide requisite feedback to help them in formulating sound proposals. Shri Chander Parkash talked about the efforts of DST in helping the sensor instrumentation activity in various institutions across the country. He expressed satisfaction that many proposals have been received from less endowed institutions.

Dr Tapan Chakrabarti, Acting Director, NEERI, briefly explained the activities of the institute and outlined the general background of the activities in this area. He emphasized on the need for good

coordination and monitoring of the activities. Dr (Mrs) Neeta Thacker, Scientist & Head, Analytical Instruments Division, NEERI and organizer of the meeting, explained about various state-of-art on-line, lab and field instruments available globally. She also outlined technologies used for mitigation of water pollution problems.

Dr B. S. Satyanarayana delivered a lecture on 'Water Pollution Detection and Mitigation — Status, Challenges and Opportunities'; Dr Dipankar

Chakrabarti on 'Need-based research should be the approach of Indian scientific community'; Prof. (Ms) Kamal Singh on 'Electrochemical water sensors'; Dr A. Q. Contractor on 'Electrochemical sensors for rapid detection and estimation of environmental and healthcare parameters' and Dr T. Venkatesh on 'Lead — A useful and hazardous commodity'.

There were a total of 39 pre-proposal presentations during the meeting. There was a good interaction between the PIs and the members/experts/speakers.

Dr G. L. Bodhe, Scientist, NEERI, proposed the vote of thanks.



SERC celebrates its Foundation Day

The Structural Engineering Research Centre (SERC), Chennai, celebrated its Foundation Day on 10 June 2008 at the Vigyan Auditorium, SERC. Dr V. Kalyanaraman, Senior Professor of Civil Engineering at IIT Madras and a distinguished member of the Research Council of SERC, was the Chief Guest on the occasion. Dr Kalyanaraman delivered the Sixth Prof. G.S. Ramaswamy Memorial Lecture on 'Recent Studies on Cold-Formed Steel Structures'. In his lecture, he pointed out that cold-roll forming of steel provided it flexibility so that it could take on any shape and thus was amenable to function as different types of structural members. However, the load behaviour of these members, particularly the buckling of steel members, has been a subject of intense study by many researchers all over the globe for several decades. The complexity of load behaviour involves local buckling, distortional buckling, overall buckling, and a combination of all these modes.

Dr Kalyanaraman presented a brief review of the existing Codal Provisions of the Euro Code, the American Iron and Steel Institute Code, the German Codes and the Australian Code. From a comparison of available Code procedures with experimental data, he showed that there were large deviations between theory and experiments. Once we employ the Direct Strength Method, he showed that there was very good agreement between predicted

behaviour and measured data. He touched upon the recent work on Cold-Formed Steel Housing System (CFS) and emphasized that light-weight nature and fast-track wall panel construction are supportive of constructing CFS house system even in earthquake prone zones. Dr Kalyanaraman emphasized the need for adopting performance-based structural designs.

Earlier, Dr N. Lakshmanan, Director, SERC, while welcoming the distinguished gathering, mentioned that SERC has been among the excellent performing laboratories of the CSIR system for many years now. He felt justifiable pride in mentioning that SERC was a most sought-after R&D Centre by the structural engineering industry in the country for high quality research and consultancy services. The laboratory's performance, as far as publication of research papers in international journals of repute is concerned, has been on the up-trend. The Director exhorted the scientists to achieve further laurels in that direction.

On the occasion, 20 members of staff of SERC were honoured with Certificates of Appreciation and Cash Incentive awards for their contributions to Business Development of SERC during 2007-08. Mementos were given to those staff members who had made contributions at different stages of the establishment and commissioning of the Advanced Seismic Testing and Research Lab at SERC during 2007.

Dr C.R. Krishna Murti Memorial Oration at IITR, Lucknow

The Indian Institute of Toxicology Research (Formerly Industrial Toxicology Research Centre), Lucknow, organized the Dr C.R. Krishna Murti Memorial Oration on 5 June 2008, in memory of Dr C.R. Krishna Murti, a well known biochemist and environmental scientist of India and Director of IITR during 1978-83. Prof Harsh Gupta, a renowned geophysicist, former Director, National Geophysical Research Institute (NGRI), Hyderabad and presently Raja Ramanna Fellow at the same institute, delivered the oration entitled 'India's Initiative in Mitigation of Tsunamis and Storm Surges'.

Prof Gupta said that the population of south-east coastal areas of India is victim of both storm surges and tsunamis, and their mitigation has several commonalities in terms of observational network, database on bathymetry and coastal topography, data communication, dissemination of warnings, training and education, and operational practices. It is, therefore, prudent and cost effective to address them together. Accordingly, it was planned to develop an integrated mitigation system for the oceanogenic disasters such as



tsunamis and storm surges in the northern part of the Indian Ocean region with the ultimate goal to save lives and property.

Prof. Gupta explained that the design of the system is based on end-to-end principle, involving Mean real-time estimate of earthquake parameters; Assessment whether a tsunami has indeed been generated through deployment of ocean bottom pressure sensors and tide gauges; Numerical modeling for tsunami and storm surges with all associated data inputs; Generation of coastal inundation and vulnerability maps; Development of Tsunami Warning Centre at INCOIS, Hyderabad and its operation on 24 x 7 basis for generation of timely advisories for implementation, and Capacity building, education, and training for all stakeholders.

He informed that the planning of the project started in January 2005. All the details were worked out by March 2005 and it was estimated that it would be operational by September 2007. He proudly mentioned that the deadline was met successfully and the system was validated during the occurrence of the tsunamigenic earthquake on 12 and 13 September 2007. Today, this is the best system operating anywhere in the world. The project was implemented by the Department of Ocean Development (now Ministry of Earth Sciences) through its institutions, with active participation from Department of Science and Technology, Department of Space, Council of Scientific and Industrial Research, and University departments.

Dr C.R. Krishna Murthi Memorial Oration has been delivered earlier by eminent personalities like Prof. A.K. Tyagi (2007), Prof N.K. Ganguly (2006), Prof. Mohan K. Raizada (2005), Dr Dinakar M. Salunke (2004), Prof. Samir K. Brahmachari (2003), Dr Kanury V.S. Rao (2002), Prof Rajendra Prasad (2001), Dr Maharaj K. Sahib (2000), Prof. R.K. Maheshwari (1999), Prof. Asis K. Dutta (1998) and Prof. S.S. Agarwal (1997).

India in the Exciting Space Frontier

A.V. Rama Rao Technology Award

Lecture by

Prof. U. R. Rao

The Indian Institute of Chemical Technology (IICT), Hyderabad, celebrated this year's National Technology Day by arranging the A.V. Rama Rao Technology Award Lecture by Prof. U. R. Rao, Former Chairman, Space Commission and ex- Secretary, Department of Space, Government of India. Prof. Rao spoke on "India in the exciting space frontier".

A former faculty member of MIT, USA and a disciple of late Prof. Vikram Sarabhai, Prof. Rao talked about the Space research in India and *Chandrayaan*, India's ambitious Moon mission and said that India could hopefully send manned missions to the Moon in the next 6 to 7 years. He further explained that using the present space technology, India could achieve green revolution as well as monitor the climate, environment and biodiversity. Space technology would be handy for the country's energy security and water management and crop yields can be monitored in addition to authentic surveys of land and oceans for minerals and other natural resources. Earth observations was the need of the hour in order to monitor the climate and changing biodiversity, Prof. Rao emphasized.

Earlier, Dr J.S. Yadav, Director, IICT, highlighted the significance of the National Technology Day and stated that IICT has been observing this day every year by inviting a reputed scientist / technologist to deliver a lecture. Dr A.C. Kunwar, Director-Grade Scientist, introduced the speaker to the gathering. After the lecture, Prof. Rao was felicitated with the A.V. Rama Rao Technology Award which carries a cash award of Rs. one lakh and a citation. This award was instituted in honour of Dr A. V. Rama Rao, former Director of IICT and is conferred on an eminent scientist/ technologist who has immensely contributed to national goals.

Young Scientist Award to CIMAP Scientist



Dr Suaib Luqman Scientist CIMAP receiving the Young Scientist Award

Dr Suaib Luqman, Scientist, Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow, has been given the Young Scientist Award for the year 2005-2006 of the Council of Science and Technology, Government of Uttar Pradesh in a Science Award function held recently at the Scientific Convention Centre, Lucknow.

Dr Suaib did his Bachelor's degree in Biology from Ewing Christian College, University of Allahabad (1995), Master's degree in Biochemistry (1997) and Doctor of Philosophy (Ph.D.) degree in Science from the University of Allahabad (2003). Dr Suaib is working in the area of bioactivity prospection and molecular aspects of Medicinal and Aromatic Plants (MAPs) at the Genetic Resources and Biotechnology Division of CIMAP. His interest involves molecular targets and biotransformation of active ingredients and secondary metabolites present in the medicinal and aromatic plants that have high potential to be used as a novel drug.

Prashant Barve gets 2003 VASVIK Award for 2003



Shri Barve receiving the VASVIK Award at the hands of Dr A.P.J. Abdul Kalam. Also seen (*on the right*) is Dr Mohan I. Patel, Chairman, Board of Directors, VASVIK Foundation

Shri Prashant P. Barve, Head, Process Development and Engineering Group at the National Chemical Laboratory (NCL), Pune, has been awarded the 2003 VASVIK Award for his contribution to Chemical Sciences and Technology. Shri Barve during the last few years has developed many novel and efficient processes for important fine and bulk chemicals, which are either exported or produced by only a handful companies around the world.

Shri Barve and his team have developed a novel process to make ATBS (acrylamido tertiary-butyl sulfonic acid), a specialty monomer used as co-monomer in polymerization processes. The process protected by patents, was further scaled-up to a kg level. A continuous process was also developed. Both the processes were transferred to Vinati Organics Ltd (VOL), Mumbai, for commercial implementation. This is the first manufacturing plant for ATBS in India. NCL team led by Shri Barve provided commissioning assistance and training of technical and analytical staff.

This technology was earlier selected for CSIR Technology Award for the year of 2005. The award was presented to Shri Barve at the hands of the former President of India, Dr A. P. J. Abdul Kalam on 16 August 2008. The award carries a cash prize and a citation.



Dr P.S. Ahuja receives 2005 VASVIK Award for 2005

Dr Paramvir Singh Ahuja, Director, Institute of Himalayan Bioresource Technology (IHBT), Palampur, has been awarded the VASVIK Award for 2005 for his research contribution to Agricultural Sciences & Technology. Dr Ahuja received the award from Dr A. P. J. Abdul Kalam, former President of India, on 16 August 2008 in Mumbai. These Awards are given by Vividhlaxi Audyogik Samshodhan Vikas Kendra, a non-profit, non-government organization established in 1973 and run by the owners of the Patel Extrusion Group.

From early years, Dr Ahuja has exhibited scholarly aptitude. He received National Merit scholarship for B.Sc. (Agri.) and Junior Research Fellowship for M.Sc. (Agri.). His work led to the identification of two important *Lr* genes which were later recommended for development in multiple breeding programme by the ICAR's All India Co-ordinated Programme on Wheat. He received Common Wealth Fellowship for Ph.D. and carried out doctorate work under famous scientist Prof. E.C. Cocking from Nottingham University in 1983. He, for the first time, established that cell suspension from leaf base callus were capable of whole plant



Dr P.S. Ahuja receiving the 2005 VASVIK Award at the hands of Dr A.P.J. Abdul Kalam

regeneration and that the regenerants were somaclonal variation comprising aneuploids. He visited Canada and USA for post doctorate work under Visiting Scientists Fellowships from respective countries. Returning to India Dr Ahuja joined as Scientist 'C' in CIMAP, Lucknow and headed Division of Plant Tissue Culture. He developed infrastructure and a research agenda. His work resulted in development and release of the first somaclonal variety CIMAP Bio 13 of *Cymbopogon winterianus* in India. He also carried out commendable work on somatic hybridization in tropaeol alkaloid bearing plants wherein 4 somatic hybrids were developed. Significantly, he also contributed

towards tissue culture propagation of some Rare Endangered and Threatened species of alpine Himalayas.

Dr Ahuja took over as IHBT Director on 13 April 1998. After taking over as Director, Dr Ahuja transformed IHBT from a tea research institute to a world class institute doing frontier research on plant sciences. Under his leadership the institute developed a focused mandate on sustainable utilization of bioresource and biodiversity conservation. He strengthened the basic

research facilities and opened new fronts particularly in the area of plant genomics, proteomics, metabolomics and nanobiology. He developed mapping facility integrated with GIS platform which resulted in creating species specific maps of economically important plants of H.P. supported with ground truthing. He strengthened work on natural plant products. He co-ordinates a prestigious Tea Network programme and is playing a pivotal role in characterization of the National Tea Germplasm.

Dr Ahuja is also holding the additional charge as Director, Central Institute of Medicinal & Aromatic Plants, Lucknow, since 1 July 2008.