

CSIR NEWS

ISSN 0409-7467

VOL 55 NO 23 15 DECEMBER 2005



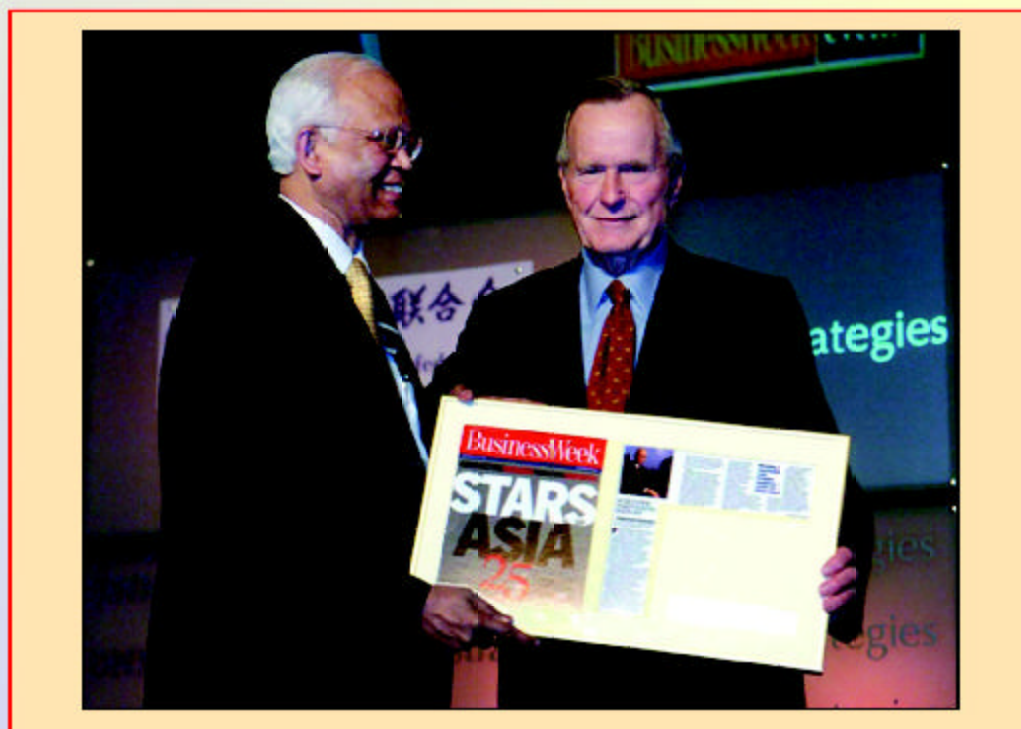
Team CSIR



Dr R. A. Mashelkar receives **Star of Asia Award** from George Bush, former US President

Dr Raghunath Anant Mashelkar, FR5, Director General, Council of Scientific & Industrial Research (CSIR), received the Star of Asia award at the hands of George W. Bush, the former President of USA, at a specially held function on 16 November 2005 in Beijing.

Every year, *Business Week* of USA honours 25 Eminent Asians, who have been path breakers in their own fields. This year's list included eminent



personalities from different countries, including the present President of Indonesia for handling the Tsunami tragedy in an exemplary way.

Star of Asia awards have traditionally gone to businessmen, politicians etc. For example, last year, the award-winners from India had included Sonia Gandhi and Ratan Tata. This is the first time a scientist is being honoured from Asia.

The citation lauded Dr Mashelkar's efforts in transformation of CSIR, his role in leading India's intellectual property rights movement and also his

overall impact in the last decade on influencing Indian S&T policy and direction.

The high profile event was attended by several eminent dignitaries, which included Sir John Major, former PM of Great Britain, Michael Moore and Jenny Shipley, who were the former PMs of New Zealand; Bob Hawke, former PM of Australia and Mahathir Mohammad, former PM of Malaysia.

NISTADS signs MoU with FADA

THE National Institute of Science, Technology and Development Studies (NISTADS), New Delhi, has signed an MOU with the Faculty of Art, Design and Architecture (FADA), University of Johannesburg, South Africa. The objectives of signing this MoU are to conduct studies on selected groups/communities with a view to understanding and delineating the traditional systems of knowledge bases and the possibilities to blend these knowledge systems with modern scientific and technological systems. The modalities of the MoU are as follows: identify and involve a core group of researchers from both institutions to act as the coordinating body in implementing the studies and project; networking with the academic and trade/craft bodies will be established in both the countries to inventory the extant literature, map the location of communities/groups, assess the current capabilities/techniques used etc.; undertake studies using survey and case study approach to document the current practices, knowledge bases and to explore the



Signing of MoU between NISTADS and FADA

possible areas of intervention; organise joint workshops involving researchers from both the countries, stakeholders and other interested persons/organizations; compile and publish the result of the studies through both print media and electronic media; design and develop a new web site to host it on the internet for wider dissemination of information and feedback from

cyber visitors or else use the existing web sites of the two aforementioned institutions; organise exchanges through visits to either country for the purpose of advancing research and development; identify agencies, which could help design and implement technological interventions to enhance the production/productivities through

out of data/publication/web site, product development (applied design) or any other intellectual property jointly generated would be equally shared between the two institutions; in case of any dispute/disagreement/misunderstanding the decision of the two signatories would be final; and during the period when this present MoU is in place the two institutions may further explore areas on mutual interest and jointly carry out research/projects in such areas.

This MoU shall be effective for an initial period of two years from the date of its execution; it may be extended automatically with the mutual consent of the two institutions. This MoU may be cancelled at any time by one of the parties at six months notice.

NEERI develops Antibacterial Formulation for Drinking Water

THE National Environmental Engineering Research Institute (NEERI), Nagpur, has developed an antibacterial formulation for drinking water purification based on ancient Indian literature. The objectives of the study included:

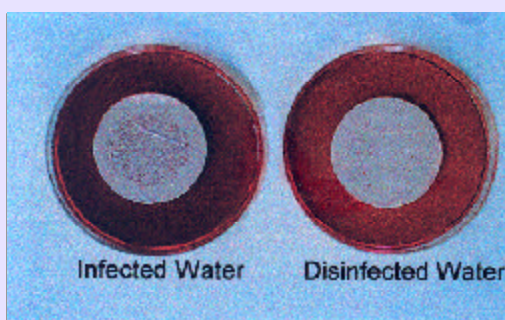
- ◆ Development of a formulation using natural resources (herbs/herbal origin) present in the ancient literature for well water treatment, for the rural population
- ◆ Establishing utility and sustainability of the formulation through a case study

NEERI has screened various herbs for antibacterial property based on ancient literature. The oil samples tested in the study were Clove oil, Eucalyptus oil, Sandal oil, Kapur Tulsi oil, and Ropan oil. These are the oil preparations with proven medicinal values. The preliminary data suggested that clove extract or clove oil works efficiently and could be used as an antibacterial agent. To overcome the problem of mixing with water, the oil was further emulsified for application purpose. The preparation was made in such a way that it should use minimum possible

amount of clove oil, so that it should not part colour and taste to water. Later on, attempts were made to make preparation acceptable to bacteria as food. Hence, the emulsion of clove oil was generated using Tween 20 by varying sonication and holding time period. To have a stable emulsion, disodium hydrogen phosphate and corn oil were added.

This study led to the invention of a simple and natural method for disinfections of well water by using a formulation of clove oil. More particularly, this invention relates to clove oil emulsion preparation. This formulation can be used to disinfect contaminated water containing pathogens and make it potable.

About a litre of water requires about a teaspoon of antibacterial formulation and the water gets disinfected in about 6h. To remove turbidity, the water should be first passed through muslin cloth. The photograph shows the removal of *E. coli* from contaminated water by NEERI's antibacterial formulation. The left plate shows bacterial contamination in the water sample. This is disinfected by the addition of NEERI's formulation, as can be seen from the right plate.



U.S Patent No.: 6,929,810, 16 August 2005

Inventors: Purohit; Hemant J. (Nagpur, India); Kulkarni; Manisha (Nagpur, India)

Assignee: Council of Scientific and Industrial Research (New Delhi, India)

Successful Transition of *Rhizobium* based NBRI Biotechnology from Lab to Field

DR Chandra Shekhar Nautiyal and Dr H.B. Singh, Division of Plant-Microbial Interactions, National Botanical Research Institute (NBRI), Lucknow, have been working along with Department of Agriculture, Government of Uttar Pradesh since 2002 on products which are useful as plant growth enhancers and biopesticides for seed, soil and foliar applica-



Dr P. Pushpangadan, Director, NBRI (right) handing over the culture of *Rhizobium* to one of the officers of UP Government

tions. The efforts are ensuring niche benefits to farmers. In terms of environmental benefits the impact of technologies developed is innumerable; these will lead to reduced use of chemical fertilizers. Work is being pursued under Macro Mode project funded by World Bank. NBRI has already received Rs one crore so far from UP Government to transfer the technology and train officers of Department of Agriculture from 17 biofertilizer and 9 biopesticide manufacturing units. *Rhizobium* based technology has been licensed to Department of Agriculture, Government of Uttar Pradesh.

Under the programme so far 11 training programmes have been organized under which training has been imparted to 1661 farmers and 246 officers of

Department of Agriculture. Commercial production based on the technology transferred had begun since 2004. So far 90,000 acres of land have been covered for legume crops. The cultures of *Rhizobium* and *Azotobacter* were distributed by Dr P. Pushpangadan, Director, NBRI, to the officers of

Department of Agriculture during the training programme, to cover 51500 and 10500 acres of pulses and wheat crop, respectively. Field trials are being conducted at the 9 farms of Department of Agriculture using phosphate solubilising bacteria (PSB) of NBRI. If successful, the PSB technology will cover 204275 acres by 2006 all over Uttar Pradesh.

In terms of environmental benefits the impact of the aforementioned technologies will be innumerable, as these will lead to reduced dependence on chemical fertilizers of the economic crops. The deterioration in soil and water quality will be checked if the use of technologies and products move on the anticipated path.

New Projects at RRL-Bhopal

The new projects taken up at Regional Research Laboratory (RRL), Bhopal, include:

- Beneficiation studies of low grade chromite ore, M/s Jindal Stainless Ltd, Rs 200,000.
- A novel cost effective process for making nano materials, useful for catalysis and application in making electrode, DST, New Delhi, Young Scientist Scheme, Rs 9,42,000.
- REIA and risk assessment for hydrocarbon terminals at Abu Road ad Patri, Reliance Industries Ltd, Rs 9,00,000.

NEERI, Environmental Materials Unit: S&T Activities

MOLECULAR approaches to environmental problems present researchers with enormous challenges. The ongoing R&D on materials science the world over, therefore, focuses on the field of structured nanoporous materials. Various aspects include synthesis and functionality, structure elucidation, molecular modelling and interpretation/prediction of structure property relationship for a variety of materials. Such studies are bound to add to the existing knowledge of molecular design of tailor-made materials for energy and environmental applications. The ongoing work at the National Environmental Engineering Research Institute (NEERI), Nagpur, stresses on the recent advances in materials synthesis and characterization, and the applications of materials for environmental pollution control and energy related challenges. New materials such as functionalized zeolites and mesoporous materials, zeolite based photocatalytic materials, substituted and unsubstituted perovskite materials, visible-light-active TiO₂ based photocatalysts, metal nanoparticles entrapped in functionalized materials, thermally stable perovskite type ruthenates, waste materials based carbon, mesoporous carbons and synthesis of related microporous materials with

emphasis on their selectivity using new synthesis strategies are being addressed. These materials are being used for various environmental applications under the following themes:

Theme 1: Catalytic Materials for Environment and Energy Related Applications

Efforts are being made worldwide to explore avenues for new and cleaner energy resources, environment and energy conservation, and in environmental remediation. It is indispensable to develop new, advanced catalytic materials to resolve several important issues related to environment and energy. In this connection, concerted efforts are being made to develop the catalytic materials for following applications:

(i) Novel zeolite based photocatalytic materials for valorization of CO₂:

An inevitable outcome of combustion of fossil fuels is emission of CO₂. This needs to be addressed to avoid global warming and related impacts. This problem can be resolved partially by addressing the emerging concept of artificial photosynthesis which implies conversion of CO₂ into value added products, possibly using non-carbon based energy. In this connection, photocatalytic transformation of CO₂ into some value-added products namely methanol and

hydrocarbons by using solar energy source is being investigated at NEERI. Supported-TiO₂-based and further modified photocatalytic materials are being studied for this application.

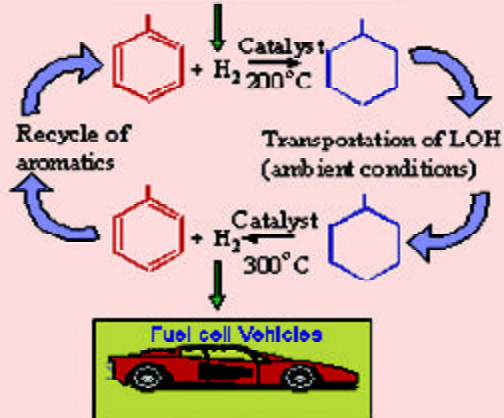
(ii) Diesel particulate filters (DPF):

Environmental consequences of diesel vehicles, particularly the particulate matter (PM) emissions, have already emerged as a major environmental problem in urban areas. Diesel particulate filter (DPF) is probably the most potentially viable option to effectively control the particulate emissions. However, finding an energy-efficient and cost-effective regeneration of DPF has been a challenge for quite some time and catalytic regeneration has been proposed as the best option for efficient regeneration of DPF. Development of catalytic materials for regeneration of diesel particulate filter (DPF) is being pursued. A range of catalytic materials based on perovskites and mixed oxides are being investigated for lower regeneration temperature for DPF.

(iii) Hydrogen storage and supply through liquid organic hydrides:

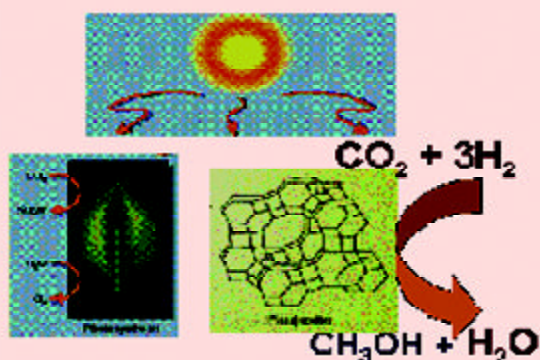
The development of fuel cells has matured to a great extent. However, storage and supply of CO-free hydrogen for efficient operation of fuel cells is still a challenge. A novel approach for supply of hydrogen

Hydrogen Production at Centralized Facility

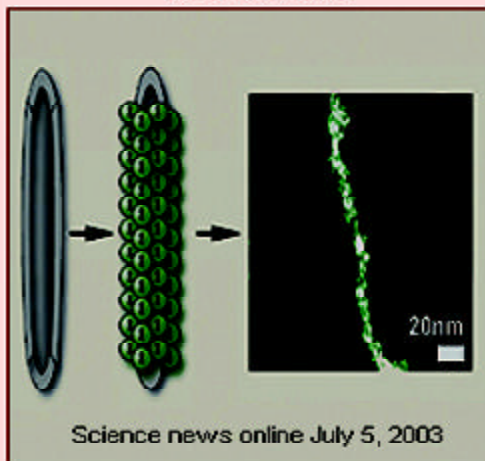


Hydrogen Storage & Supply

Artificial Photosynthesis

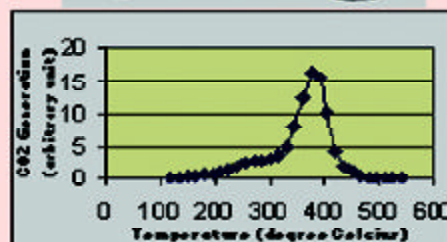


Biomaterials



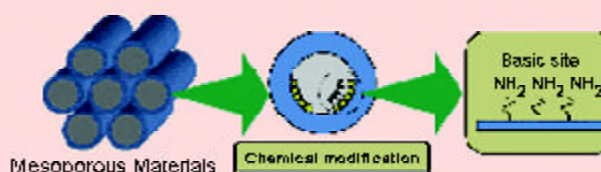
Target Materials:

- Molecular sieves & zeolites
- Surface functionalised zeolites
- Perovskite based catalytic materials
- Multifunctional metals/ metal oxides
- Carbon materials
- Photocatalytic materials

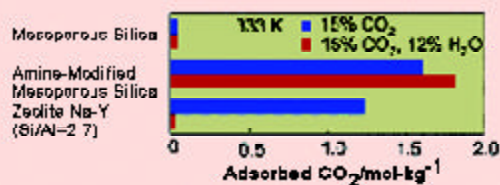


Catalytic Materials for Diesel Emission Control

Functionalised Materials for CO₂ Capture



Novel adsorbent for CO₂ separation

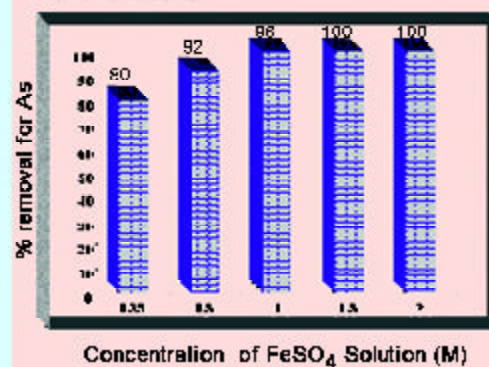


Adsorption capacity of amine-modified mesoporous silica
Source: www.rite.or.jp

Arsenic Removal:

Variation in Iron Treatment

Concentration of As = 1 mg/l Dose = 2 g/l
Contact time = 5 min pH = 7.0 ± 0.1



through liquid organic hydrides (LOH), using catalytic reaction pair of dehydrogenation of cycloalkanes, such as methylcyclohexane, cyclohexane and decalin; and hydrogenation of corresponding aromatics is one of the most promising methods for storage, transportation and *in-situ* generation of hydrogen. The advantages of this system are: CO-free hydrogen at fuelling stations, reversible catalytic reactions, recyclable reactants and products and relatively high hydrogen contents (6–8 wt %). Efforts are being made to develop catalytic materials for this application.

(iv) Methane combustion and selective reduction of NO_x :

Catalytic methane combustion is becoming attractive route to produce cleaner energy since it allows efficient and complete fuel burning at lower temperatures than in flame combustion. This results in lower emissions of unburned hydrocarbons, CO, NO_x and particulates. It is perceived as a cleaner energy route with relatively less CO₂ generation to produce same amount of energy. Ruthenium-based and other perovskite type materials have been synthesized that show good catalytic activity for methane oxidation reaction. The challenges are to retain their surface area at elevated temperatures and their long-term durability.

The major source of NO_x emissions is the combustion of fossil fuels for industrial and vehicular activities. As NO_x is invariably present with excess oxygen, 'selective catalytic reduction' (SCR)

is required for its conversion to nitrogen. The SCR processes in vogue are mainly based on ammonia as a reducing agent, and have been associated with certain limitations. Some catalysts show potential for selectively reducing NO_x by hydrocarbons, which are either present along with the NO_x emissions or can be introduced easily. NEERI has initiated research on development of SCR catalysts for their applications in controlling NO_x emissions from stationary sources, using hydrocarbons as reducing agents. Mixed oxides and zeolite based catalytic materials are initially targeted for the study considering their potential SCR activity.

Theme 2: Functionalized Materials for Environmental Applications

An interesting possibility in the design of novel materials is to tailor the surface for material-mediated reactions. Some important environmental and energy areas being pursued at NEERI include:

- Development of new, improved materials for enhanced adsorption capacity, selectivity and kinetics
- Precise and low cost development of detection and monitoring units through molecular imprinting.

(i) Functionalized materials for CO₂ capture and hydrogen storage:

Serious environmental implications of CO₂ as one of the major contributor towards green house gases have prompted researchers world wide to control the level of CO₂ in the atmosphere. The

mitigative measures for CO₂ include carbon sequestration (ocean, geological and terrestrial) and novel CO₂ utilization. It is a prerequisite for CO₂ to be in concentrated form for most of these mitigative measures. This requires separation and capture of CO₂ (12-15%) admixture with nitrogen, other impurities and particulates in flue gases. The energy costs for prevailing CO₂ separation processes account for approximately 75% of the total cost of CO₂ sequestration. Therefore, there is an urgent need for the development of novel, economical, selective, and low energy technologies for CO₂ capture (CC) from flue gases. Conventional CO₂-P (T) SA using zeolites involves dehumidification process. This consumes about 30% of total energy because of preferential adsorption of water vapour over CO₂ on zeolite surface. Therefore, a novel water-tolerant adsorbent, with a characteristic to selectively adsorb CO₂, in the presence of water vapour, is desirable. A wide array of adsorbents, including metal exchanged zeolites, amine treated zeolites and mesoporous materials and surface modified cum amine treated zeolites, have been developed and are being evaluated for CO₂ adsorption.

Similar approaches of functionalization using polymers, boranes and metal nanoparticle impregnation are being explored for the development of new adsorbents for hydrogen adsorption. This would facilitate the usage of these new adsorbents as storage materials for hydrogen. Algae-based systems for the capture of CO₂ and carbon/

silicate based materials for capture and storage of hydrogen are also proposed to be studied in near future.

(ii) Surface modified materials for arsenic removal: There is a widespread public concern on ground water containing high concentration of arsenic. The urgency for an appropriate treatment strategy comprising technological innovations for arsenic removal is evident. Novel hybrid nanomaterials (NHNMs) based on faujasitic and mesoporous molecular sieves are being developed as high performance anion getters by systematically functionalizing these materials with metal chelating agents and surfactants to modify the surface chemistry and tailor molecular recognition process for arsenic. Iron treated zeolites have also been developed and evaluated for arsenic removal. Further optimization studies are in progress to achieve the stringent limit of 10 ppb for arsenic in drinking water. Finally, it is proposed to prepare the prototype of arsenic removal kits and their evaluation for arsenic removal in drinking water.

Besides these R & D activities, it is proposed to extend the application of photocatalytic materials for preparation of indoor air filters to serve dual function of desiccation and photocatalytic destruction of VOCs. Biological materials will also be studied with specific reference to- fungus mediated nanomaterial synthesis and cellulose nanorod mediated mesoporous silica synthesis.

Indo-US Workshop on Micro Air Vehicles at NAL

THE National Aerospace Laboratories (NAL), Bangalore, recently organized a two-day workshop, supported by the Indo-US S&T Forum, AR&DB, CSIR and DRDO. More than 70 delegates from both the countries participated in the workshop.

The workshop opened with a brief welcome address by Dr A. R. Upadhyaya, Director, NAL where he explained the importance of micro air vehicles (MAV's) both for strategic and societal objectives. Dr Upadhyaya then paid a tribute to Lt. Gen Dr V. J. Sundaram for 'championing the MAV cause' in India. He also introduced Prof Inderjit Chopra of the University of Maryland who was leading the Workshop faculty and thanked Shri M. D. Aravamudhan, Director, ADE, for agreeing to inaugurate the workshop and Dr Arabinda Mitra, Executive Director, Indo-US S&T Forum for the generous support.

In his opening remarks, Prof Chopra admitted that MAV was his passion those days. He then explained the fascination of MAV. 'Sensors are becoming very precise and small, and a MAV is a very good carrier. And in the post- 9/11 world it is very important to be smarter than your adversary,' he added. 'So a MAV is

by no means a simple toy!' he further added.

Dr Arabinda Mitra provided a detailed history of the activities of the Indo-US S&T forum and indicated how he pushed support for the workshop in the 'fast track mode'.

Shri Aravamudhan explained how MAV's require intense multi-disciplinary activity involving aerodynamics, structures, flight control, navigation, power generation, sensor payloads and system engineering. 'So MAV programmes will offer a good opportunity for interactions between different disciplines.'

In his keynote address, Dr Sundaram talked of the various missions that MAV's could support: disaster management (fight fires or floods, gas leaks, earthquake relief), defence (electronic warfare, robot control, mine detection) and commercial ventures (TV, cinema, cloud seeding). 'While the inspiration is from biology', God's vehicles 'still outperform very significantly,' he said. He also explained how propulsion is the key element in MAV's.

Shri G. N. Dayananda of the Advanced Composites Division, who played an important role in organizing the workshop, proposed the vote of thanks.

Workshop on Termite and Mosquito Management at NCL

THE National Chemical Laboratory (NCL), Pune, recently organized a three-day workshop jointly with Pest Control Association of India (PCAI), Chennai, at NCL. The workshop provided both theoretical as well as hands-on-training on various aspects of mosquito and termite management to about 40 pest control professionals affiliated to PCAI. Eminent scientists from different research organizations as well as the pesticide industry delivered lectures covering various aspects of pest control operations. Scientists from the Entomology Group of NCL disseminated knowledge to the pest control professionals to identify the different pest species viz. termites and mosquitoes, life stages of pests, timely as well as environment safety aspects of pesticide use.

Dr B.D. Kulkarni, Deputy Director, NCL, welcomed the participants and invited guests on behalf of NCL. He expressed the need to control the pest menace in a systematic way. Shri Deepak Gupte, Executive Vice-President, PCAI, welcomed the audience on behalf of PCAI and wished the pest control professionals to successfully and seriously complete the workshop. He said that PCAI's aim is to control but not eradicate the pests. 'Pests control is necessary and need to be achieved with minimum use of chemicals,' he added further.

Shri A.V. Nene, President, PCAI, spoke on the status of the pest control operators (PCO). Though, PCAI has been organizing the training programmes and workshop for the benefit of pest control professionals, he regretted that no data is available about the number of valid licence holders. He appealed the government authorities to categorize work nature of PCOs and include them in the government list at proper place. To amend the situation of pest control he also urged to make the training compulsory for all PCOs.

Dr P.S. Chandurkar, Plant Protection Advisor to the Government of India while releasing the workshop proceedings shared his thoughts with the participants and the audience. He said that 1% of the insect species are beneficial to human beings, and among the rest, mosquitoes and termites are the most damaging to human health as well as structures. He



Dr P.S. Chandurkar, Plant Protection Advisor to the Government of India, delivering his address

congratulated PCAI for initiating the training programme on termite and mosquito management. He said that we need to use pesticides very judiciously otherwise insects can develop the resistance to them as has happened with DDT and some other molecules in case of agricultural pests. Searching a new molecule is not only time consuming and scientific labour intensive but is also very costly. 'We have to take care of the safety of both the occupants of the place and PCOs also,' he stated further.

Dr Chandurkar urged the industry to come forward to define the standards of quality evaluation, licensing and training. Looking at the future, he said there are lots of bright opportunities in this sector and the scope is unlimited as the people are becoming more aware of the health issues related to pests and pesticides. The quality and cost effectiveness of such services will keep one ahead in the business, he said to PCOs. He also urged PCAI to set minimum standards for PCOs.

Dr Y.L. Nene, Chairman, Asian Agri-History Foundation, Secunderabad and former Deputy Director General, International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), was felicitated with lifetime achievement award. In his keynote address he mentioned few herbal plants, which have insecticidal activity and suggested to exploit those plants as future pesticides. He appealed to trainees and the

dealers that through such training programmes only the PCOs can deliver the services most effectively since, the user is mostly influenced by the advice of the dealer on how to make use of pesticide. He also urged to make use of electronic media to communicate the right message and educate people on the proper use of pesticide.

The inaugural function was attended by eminent personalities from the field of pest control and agriculture including office bearers of PCAI. A video film detailing the formation of PCAI and its activities was shown on the occasion. Dr S.N. Mukherjee, Senior Scientist, Entomology Group, NCL, proposed the vote of thanks on behalf of NCL, while Ms. Vijaya Adyanthaya, Member, PCAI, expressed the vote of thanks on behalf of PCAI.

The next day, Shri M.B. More, a private pest control consultant from Nashik, delivered a highly informative lecture on different species of termites, their identification and control measures. In another lecture Dr G. Geevarghese, Deputy Director, National Institute of Virology, Pune, spoke on the ecology and biology of mosquito species, which are carriers of malaria, filaria and dengue.

In the morning session of the concluding day, Dr A.G. Chandele, Professor and Head, Entomology, Pune College of Agriculture, gave a fascinating lecture on the 'use of baited traps to control termites'. Shri Kedar S. Bhide, Manager-Market Development (Public Health Business), Sumitomo Chemical India Pvt. Ltd, Mumbai, gave a talk on the 'modern methods of chemical



Dr Y.L. Nene, Chairman, Asian Agri-History Foundation, Secunderabad delivering the keynote address

control of mosquitoes'. The third lecture was delivered by Dr P.C. Kanojia, Assistant Director, National Institute of Virology, Pune, on 'surveillance of disease outbreaks due to mosquitoes'. The last lecture was on 'termite and legislation issues related to the pest control industry' by Shri Anant V. Nene, President, PCAI.

Scientists from Entomology Laboratory of NCL, Drs (Smt.) P.V. Pawar, S.G. Deshpande and S.B. Bhonde imparted practical training in the afternoon sessions. On the first day drilling, dosing, area measurement procedures of buildings and identification of the different species of termites were dealt with. On the next day, practical demonstrations of the use of fogging machine for outdoor mosquito control, identification of different species of mosquitoes, their life stages, evaluation of bio-efficacy and persistence of different types of insecticidal formulations, evaluation of vaporizers and repellents, etc. were imparted to the participants. The workshop ended with distribution of certificates to the participants by Dr S.N. Mukherjee, for participation and successful completion of training.

Workshop on Emerging ITS Technologies

The Central Road Research Institute (CRRI), New Delhi, organized a workshop on 'Emerging ITS Technologies'. As such, the traffic flows at national levels are growing at about 8 per cent per annum and to keep pace with this growth, it is essential to adopt refined levels of management of traffic operations. Intelligent Transportation Systems (ITS) is one such option offering innovative and cost effective solutions for achieving maximum capacity out of the existing highway facilities thereby enhancing traffic safety. The workshop was specifically focused on the emerging ITS technologies which are in practice in the developed world like USA and Japan. Eminent personalities from USA and Japan participated in the workshop and shared their experiences with the Indian counterparts. It is hoped that the experiences gained from the workshop can be gainfully utilized for the ongoing programme under the Tenth Plan Network project titled. 'Development and Evaluation of Intelligent Transport System (ITS) for Indian Traffic Conditions' being implemented on experimental basis on selected road stretches/locations in and around Delhi.

Foundation Day Celebrations at Laboratories/Institutes

As mentioned earlier, all the 38 CSIR laboratories/institutes celebrated the CSIR Foundation Day on 26 September 2005, with great enthusiasm. The programmes held at some of the laboratories were highlighted in 30 November issue of this newsletter, and at a few more labs are being covered in this issue of *CSIR News*. These are: IICT, NAL, NCL, NGRI, NIO, RRL-Bhopal, RRL-Jorhat and SERC.

Indian Institute of Chemical Technology (IICT), Hyderabad

At IICT, a special programme was organized on this occasion where Shri K. Sambasiva Rao, Member of Parliament (Lok Sabha) was the Chief Guest. Shri Sambasiva Rao, an accomplished engineer from Regional Engineering College, Warangal (presently NIT, Warangal), appreciated the R&D achievements made by IICT and said that CSIR with its 38 laboratories all over India was doing yeoman's service to the nation. Dr S. Asif H. Abidi, former member, Central Institute of Fisheries Education and Agricultural Scientists Recruitment Board and former Advisor, Department of Ocean

Development, Government of India, who was the Guest of Honour of the function, delivered the Foundation Day Lecture on 'Issues of Indian science & technology'.

Dr Abidi, in his lecture, said that by having institution like IICT, which is being torch bearer in its field of activity, India is advantageously placed with rich scientific infrastructure. The Indian Industry should take advantage of this and apart from its willingness to invest in R&D, the Industry should be willing to take risks and should have patience to wait for the returns. As a matter of fact, there is no substitute for our industry itself investing heavily in the in-house

R&D and synergising with our national institutions. Awards and mementos were presented to IICT staff members who retired during the year, and those who completed 25 years of continuous service in CSIR.

In addition, employees' children were given cash awards for outstanding performance at school and college level. A studentship of Rs 1000 pm to staff children, who obtained admission in IITs, IIMs during the academic year, was also declared. This year, CSIR Outstanding Performance Awards, were introduced for the first time and 21 meritorious workers in IICT received the awards.

National Aerospace Laboratories (NAL), Bangalore

NAL celebrated CSIR Foundation Day Function at the S. R. Valluri Auditorium on 26 September 2005. Dr M. R. Nayak, Adv (M&A), opened the day's proceedings. He invited Dr A. R. Upadhy, Director, NAL, to formally welcome the gathering.

Dr Upadhy started by paying a warm tribute to CSIR's

leaders (from S. S. Bhatnagar in 1942 to R. A. Mashelkar in 2005) and talked of the 'honour, pride and happiness' to belong to CSIR. He mentioned, in particular, CSIR's leadership in the IPR movement in India, and expressed his satisfaction at the growing lab reserve in CSIR labs. Dr Upadhy then read out statistics of the impact factor of

CSIR's journal papers. Dr Upadhy ended his welcome speech by introducing the speakers: Prof. P. Balaram and Shri M. S. Ramachandra.

Shri Ramachandra talked of the need for (and types of) business alliances, about the special strategies that must be adopted for critical technologies such as

Foundation Day Celebrations

aerospace, about how doing business within the government sector is different from business with the private sector and about the growing importance of human resource management. Shri Ramachandra also explained the intricate planning involved in ensuring that NAL remains CSIR's

top lab in external cash flow (ECF) and the reasons behind his team winning the coveted CSIR Business Prize in 2002.

At the end of the function, Prof. P. Balaram distributed prizes and cash awards to the children of NAL employees who have excelled in academics, sports or extra-

curricular activities. There was also a resounding applause when Dr Nayak announced that NAL had won the CSIR Technology Prize in Engineering for the work done by the team at the Advanced Composites Division. The function ended with the vote of thanks proposed by Dr M. R. Nayak.

National Chemical Laboratory (NCL), Pune

At NCL, Dr G. Thyagarajan, former Director of RRL, Jorhat; RRL, Hyderabad; and CLRI, Chennai; delivered a special lecture on 'The CSIR in India's life and part of it: Glimpses of events, people and places', on the occasion of CSIR Foundation Day.

Dr S. Sivaram, Director, NCL, in his welcome remarks traced the foundation of CSIR, by the then government before independence, to support the requirement of armed forces in World War II. He said, 'On CSIR Foundation Day we pay tributes to the vision and selfless efforts of founders and builders of CSIR by inviting a distinguished member of CSIR family to deliver a lecture under the series 'Builders of CSIR'. Introducing Dr Thyagarajan to the audience, Dr Sivaram said, "Dr Thyagarajan is an outstanding organic chemist. At the relatively young age he became a manager of science and scientists and has a unique record of having held the



Dr G. Thyagarajan, former Director of RRL, Jorhat; RRL, Hyderabad; and CLRI, Chennai; delivering CSIR Foundation Day Lecture

directorship of three laboratories of CSIR namely Regional Research Laboratory, Jorhat (1974- 1980), RRL (now Indian Institute of Chemical Technology), Hyderabad (1981-1984) and Central Leather Research Institute, Chennai (1984-1994) for 20 long years".

Dr Thyagarajan in his talk reminisced on the origin and growth of CSIR. He listed several personal traits of former and present

Director Generals of CSIR and their contribution to the growth and autonomy of CSIR. He compared the contribution of CSIR with other similar national S&T organizations. He also identified a few missed opportunities and gave valuable suggestions on issues such as improving work culture, induction of new talent, introduction of golden handshake scheme, opening of CSIR interaction window abroad and establishing of CSIR Staff College. Mementoes were given at the hands of Dr Thyagarajan to the Council employee who retired during last one year, to those who completed 25 years of service in Council, to the students, from nearby schools, who excelled in the 'Science Quiz' programme organized by NCL, and to the wards of the employees who scored 90% and above marks in science and math's of their Std. XII examination. CSIR sports promotion board awards were also given on the occasion.

National Geophysical Research Institute (NGRI), Hyderabad

At NGRI, Dr Satinder Kumar Sikka, Scientific Secretary, Office of the Principal Scientific Adviser, Government of India, was the Chief Guest and delivered the CSIR Foundation Day Lecture on 'High pressure research and earth'. He said that most of the deep focused earthquakes are associated with subduction zones. He summarized the various experimental studies and opined that the earth's deep interior contains methane gas. He brought out the significance of temperature inside the earth and its effect on the environment.

Later, Dr Sikka presented mementoes to superannuated staff and also those who have completed

25 years of service in CSIR. He also presented the cash awards to the wards of NGRI staff who have secured 90% or more marks in science subjects in examination.

Earlier, Dr V. P. Dimri, Director, NGRI, welcomed the chief guest and introduced him to the audience. Dr S. K. Verma, Scientist G, proposed vote of thanks.

The institute was kept open for the public on this occasion.



Dr V.P. Dimri Director, NGRI, presenting memento to Dr S.K. Sikka

More than 4000 students and other people visited NGRI laboratories and observatories.

National Institute of Oceanography (NIO), Goa



Prof. Roddam Narasimha delivering the public lecture

NIO observed CSIR Foundation Day on 26 September by keeping its laboratories open to visitors and by organizing a public lecture. About 2000 students from 29 school/colleges visited the institute. Films on ocean sciences were screened and working of specialized equipments was demonstrated. The visitors were also given opportunity to interact with scientists. The public lecture was delivered by Padma Bhushan Prof. Roddam Narasimha, Chairman, Engineering Mechanics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research,

Bangalore. He spoke on 'The Future of Indian Aerospace'. The lecture traced the history of aerospace research in India and underlined its notable achievements including the launching of SARAS by NAL. While presenting India's aerospace today, he provided glimpses of ongoing activities in development of aircrafts, UAVs, and space missiles. Prof. Narasimha felt that now there is a need to enhance synergies among industry, R&D institutions and academia. Concluding his talk, Prof. Narasimha said that like in Information Technology and Biotechnology, India can become a

R&D hub in aerospace too. This, however, would need self-confidence, impatience, and hunger for global success in spite of many gaps and holes. In the afternoon programme of the Foundation Day celebrations, Dr S.R. Shetye,

Director, NIO, honoured 21 retired employees with shawls and Sanman Patra for the service rendered to CSIR. The 28 employees who completed 25 years of service received wrist watches as a token of their valuable services. Four

wards of employees received from CSIR Sports Promotion Board stipend of Rs 5000 each for excelling in sports, and one ward received CSIR Studentship award for obtaining highest marks in science subjects.

Regional Research Laboratory (RRL), Bhopal

RRL, Bhopal, is also celebrating its Silver Jubilee Year on 26 September 2005 along with the Foundation Day of CSIR at the laboratory premises. Dr Placid Rodriguez, Distinguished Visiting Professor, Department of Metallurgical & Materials Engineering, IIT, Madras, and former Director, IGCAR, Kalpakkam was the Chief Guest on the occasion. Dr Rodriguez delivered the Foundation Day Lecture on 'Interaction between experiments and theoretical development in materials science and engineering'. An exhibition on the R&D achievements of RRL, Bhopal was also inaugurated by the Chief Guest on this occasion.

Dr Placid Rodriguez, while inaugurating the function, highlighted the relationship between science and technology. In his lecture, he highlighted the impact of Nuclear Technology on Materials Sciences and Engineering, citing the various examples of the interplay between experiments and theory and between Science & Technology in a lucid way.

Welcoming the Chief Guest and other dignitaries Dr N. Ramakrishnan, Director, RRL, Bhopal, underlined the achievements



Seen on dais during CSIR Foundation Day Celebrations at RRL-Bhopal (from left) are: Dr C.B. Raju; Dr N. Ramakrishnan, Director, RRL-Bhopal; Dr Placid Rodriguez and Dr K. Basu

of CSIR and RRL, Bhopal. He said that this is the time we look back at our achievements. 'Our mandate is not only to generate knowledge but also to utilize it', he said. He also highlighted the three major areas of work of RRL, Bhopal, which are design and development of new materials and processes for automobile and aerospace applications with special emphasis on CAE-CAD-CAM route; development of natural fiber based composites with emphasis on sisal fiber technologies; and development of materials from industrial solid wastes with special emphasis on fly ash.

Dr K. Basu, Scientist G, welcomed the Chief Guest and gave the introduction of the theme of the function. The Chief Guest also presented the in-house recognitions and awards. Mementoes were given to the staff members for completing 25 years of service in CSIR. On this occasion, the Chief Guest also gave away prizes to winners of the quiz organized by IIM, Bhopal chapter, for the students.

Vote of thanks was proposed by Dr C.B. Raju, Scientist and Head, Public Relations Cell, RRL.

Regional Research Laboratory (RRL), Jorhat

This time the CSIR Foundation Day celebration was of very special significance to RRL, Jorhat as the laboratory was formally awarded the ISO certificate by the ISO auditing organisation Det Norske Veritas (DNV), Kolkata. The function was largely attended by students, teachers, invited guests, prominent citizens and other public besides the members of the RRL, Jorhat family. Dr M. Hazarika, Director, Tocklai Experimental Station, Tea Research Association, Jorhat, was the Chief Guest and delivered the Foundation Day Lecture while Shri Sasim Chattopadhyay, Lead Auditor, Det Norske Veritas (DNV), Kolkata, was the Guest of Honour. It is worth mentioning here that the International Quality Audit Organisation DNV of the Netherlands found the Quality Management System of RRL, Jorhat to conform to the Quality Management Standard and hence

conferred the Management System Certificate on it. Welcoming the distinguished gathering, Dr P. G. Rao, Director, RRL, Jorhat spoke briefly on the achievements, glory and CSIR's contributions towards the nation building and also the role played by RRL, Jorhat in the economic, industrial and societal development of the country.

Shri Sasim Chattopadhyay formally presented the ISO 9001: 2000 certificate to the Director, RRL, Jorhat which marked the beginning of ISO era in the laboratory. He spoke about the DNV, the ISO auditing organisation. He congratulated the RRL community for achieving the quality goal and also thanked the RRL management for selecting DNV for the assessment services and for being a partner in the quality movement in the region.

Dr M. Hazarika gave a very illuminating and thought provoking

lecture on 'Science perception and management' and emphasized on the need for clarity of thinking, purpose and delivery mechanism depending on future priorities for achieving success. Science, as he said, brought ease to our life. But a good scientific idea does not necessarily transform into a commercial venture. The employees who have completed 25 years of CSIR service were presented the mementoes and employees who have retired during the period from September 2004 to August 2005 were presented shawls, watches and Sanman Patras as recognitions to their exemplary and meritorious services towards the growth and development of the laboratory. The function ended with a vote of thanks by Dr Anjan Baruah, a senior scientist. The ISO internal auditors were also awarded certificates for successfully receiving the Internal Auditor training from the experts.

Structural Engineering Research Centre (SERC), Chennai

SERC and the Regional Centres in CSIR Madras Complex, Chennai, celebrated the CSIR Foundation Day by observing an Open Day in the morning and a Foundation Day Lecture cum function in the afternoon. Nearly, 2000 visitors, comprising mostly engineering college students and higher secondary school students, apart from professionals, government officials and the media,

thronged the campus and had a first hand glimpse of the various research & development projects underway, the unique and state-of-the-art experimental facilities, and some of the current and frontier programmes being undertaken, in these laboratories.

The Foundation Day Lecture was delivered by Prof. P. Ramachandra Rao, Director, Institute of Armament Technology,

DRDO, Pune (& former Director NML), on 'Creativity as a science'. Stressing that creativity is not a preserve of only the gifted individuals with in-born spark, Prof. Rao emphasized that the current thinking is that creativity can itself be treated like a scientific discipline on its own standing. Creativity can be learnt, can be inculcated and practiced, if one understands its ingredients.

CSMCRI's Project receives Daimler Chrysler Environmental Leadership Award 2005

The Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar's project on "Biodiesel from Eroded Soils of India" has received the Daimler Chrysler Environmental Leadership Award 2005.

The other collaborators in this project are: DC Germany and Hohenheim University. The project is now entering Phase II. The award was announced on Nov 15 in Magdeburg and received at a ceremony by Shri M. R. Gandhi, who also participated in the Magdeburg Environment Forum organized by Daimler Chrysler and UNEP.

Dr Sivaram selected for Dhirubhai Ambani Oration Award



DR S. Sivaram, Director, National Chemical Laboratory (NCL), Pune, has been selected for the Shri Dhirubhai Ambani Oration Award by the Indian Institute of Chemical Engineers for the year 2005.

Since 2004, Indian Institute of Chemical Engineers has dedicated 28th December as the Dhirubhai Ambani Commemoration Day for his monumental contribution to the

chemical and allied industry, which has immensely helped the chemical sciences, engineering and technology in India. The Commemoration Day will be celebrated in Mumbai with a half-day seminar in Taj Intercontinental.

The award carries a plaque, citation and an honorarium. The topic of the oration lecture is "Plastics as a material for the benefit of society".

Shri V. Chakravarthi selected for Krishnan Gold Medal

SHRI V. Chakravarthi, Scientist, National Geophysical Research Institute (NGRI), Hyderabad, has been selected for the most prestigious Krishnan Gold Medal of the Indian Geophysical Union for the year 2005, for his outstanding contributions in the field of exploration geophysics. This award will be presented to him during the 42nd Annual Convention of IGU at Barkatullah University, Bhopal.

Shri Chakravarthi has an excellent exposure in both

theoretical and experimental geophysics. One US patent was granted to him in the year 2003 for his invention on 3-D gravity modeling of sedimentary basins. CSIR has filed two more inventions made by him for possible US patents. He has received the CSIR Young Scientist Award for the year 2002 and became a Fellow of the Geological Society of India in 2003. He has published a number of research papers in International and National Journals. His contributions include development

of new strategies for modeling and inversion of geophysical anomalies.

His innovative algorithms are successfully applied over many sedimentary basins. He has played crucial role in completing prestigious projects of the institute sponsored by ONGC & OIDB for the exploration of hydrocarbons in Saurashtra, Kutch and Narmada – Cambay regions. His work on the detection of weak zones in Malani igneous suite of rocks in Rajasthan was well applauded by Geoscientists.