

CSIR NEWS

VOL 57 NO 18 30 SEPTEMBER 2007



Team CSIR



LaCONES delivers **BLACKY** — A Black Buck, by Non-surgical Intra-vaginal Insemination

THE Indian Black Buck, also called the *Kala Hiran*, is an antelope, whose four species are found in India. It is found all over the country except the North East. Owing to its dwindling population, it is today a Schedule 1 animal and thus considered as an endangered species.

A group of scientists (Drs S.D. Sontakke, Manoj Patel and G. Umapathy) at LaCONES, Annexe 1 of the Centre for Cellular and Molecular Biology (CCMB), Hyderabad, under the leadership of Dr S. Shivaji, Director-grade Scientist, CCMB, has been working towards developing assisted reproductive technologies to successfully induce pregnancy in endangered animals by artificial insemination. The present effort was part of a long-term project of the Laboratory for the Conservation of Endangered Species (LaCONES) of CCMB. Dr Lalji Singh, Director and Dr S. Shivaji, Director-grade Scientist, CCMB, are the Principal Investigators of this project.

In the present effort, a total of three females following estrus synchronization using prostaglandin F2 alpha, were inseminated non-surgically at 72 and 96 hrs. After 55 days, one of the animals conceived. CCMB scientists were delighted with their success when it delivered a live fawn at 12:00 noon on 23 August 2007. **This is the first successful artificial insemination in the world in estrus induced Black Buck, by non-surgical intra-vaginal insemination, which has led to the birth of a live fawn.**

The primary objective of LaCONES is to conserve endangered animals of India by using modern techniques of DNA finger printing, genetic polymorphism analysis and assisted reproductive techniques such as artificial insemination, *in vitro* fertilization, cryo-banking of DNA, cells and tissues and eventually somatic cell cloning. Somatic cell cloning has been successfully employed for cloning of animals such as sheep, mouse, goat, pig, rabbit, cat, dog and donkey and two critically endangered animals namely the Mouflon sheep and the bison elsewhere in the world.

LaCONES is sponsored by the Central Zoo Authority (CZA), Ministry of Environment and Forests (MoEF), Government of India; Department of Biotechnology (DBT) and Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology, Government of India and Department of Biotechnology and Forest Department, Government of Andhra Pradesh.

The newborn antelope has been named **Blacky**.



Functional polymers from divinyl monomers via cyclodextrin host-guest chemistry

CROSS-LINKED polymers find a wide range of applications such as ion exchange resins, adsorbents, molecularly imprinted polymers, supports for reagents in organic synthesis, enzyme immobilization and drug delivery systems. A sequential multi-step approach, wherein, a soluble linear polymer is first synthesized, isolated and then cross-linked offers significant advantages in most applications. Therefore, there is a need to devise a one-step methodology for the synthesis of soluble, linear and cross-linkable polymers.

Mohan G. Kulkarni and his colleagues Sunita S. Satav and Rohini N. Karmalkar at National Chemical Laboratory (NCL), Pune, in collaboration with M. Nagraju and G.N. Sastry of Indian Institute of Chemical Technology (IICT), Hyderabad, [S.S. Satav, R.N. Karmalkar, M.G. Kulkarni, M. Nagraju and G. N. Sastry, *Am.*

Chem. Soc., **128**, 24 (2006), 7752-7753.] have developed a methodology for selective polymerization of divinyl monomers such as ethylene glycol dimethacrylate and ethylene glycol methacrylate 4-vinyl benzoate by exploiting the principles of host-guest chemistry.

Cyclodextrins are torus shaped cyclic oligosaccharides produced as a result of enzymatic degradation of starch by the cyclodextrin glucanotransferase enzyme. Cyclodextrins form inclusion complexes with large number of organic guest molecules. The physical properties such as solubility, stability, volatility are modified without affecting the chemical structure of the guest molecule. Cyclodextrins have been shown to solubilize vinyl monomers and enable their polymerization in aqueous media. These inclusion complexes have found numerous practical applications in chemistry,

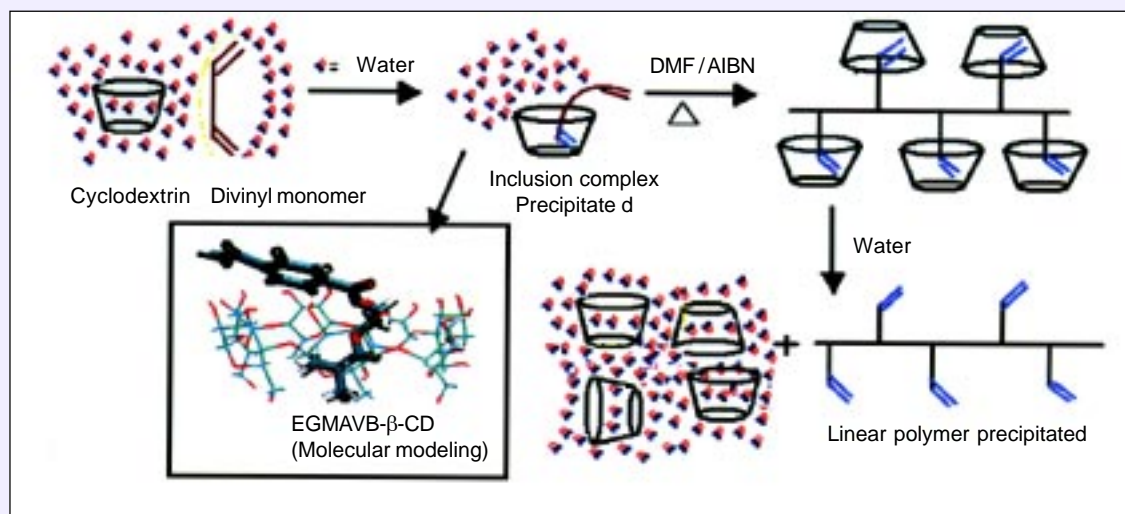
biology, and industries such as pharmaceuticals, food, cosmetic, perfumery, etc.

In the methodology developed at NCL / IICT, the water insoluble divinyl monomers form an inclusion complex with β -cyclodextrin and its derivatives such as dimethyl β -cyclodextrin. The vinyl group included in the cavity of β -cyclodextrin does not participate in polymerization. As a result, a divinyl monomer behaves as a monovinyl monomer. The polymerization results in a solvent soluble linear polymer containing one vinyl double bond per repeat unit.

Such "vinyl" functional polymers can be subsequently cross-linked by free radical initiators or by UV irradiation, to yield films, micro and nanoparticles as well as graft copolymers. Such cross-linked polymers may find application in various areas such as coatings, microelectronics, photoresists, molecularly imprinted polymers, ion

exchange resins, as chromatography support, reagent in organic synthesis, drug delivery systems and other biomedical applications. Seven patent applications are pending covering various applications of this chemistry.

www.ncl-india.org



NBRI develops 'India Herbal Garden' at WHO (Hq), Geneva

THE National Botanical Research Institute (NBRI), Lucknow, has developed an 'India Herbal Garden' at the Head Quarters of World Health Organization, Geneva. Dr Anbumani Ramadoss, Minister for Health & Family Welfare, Government of India, inaugurated the garden on 16 May 2007 in the presence of Dr Margaret Chan, Director General, WHO. The garden, showcasing some of the India's medicinal plant wealth has been developed by NBRI with the financial support of National Medicinal Plants Board, New Delhi. It may be mentioned that this is the first garden of its kind in WHO premises in Geneva.



Dr Anbumani Ramadoss, Minister for Health & Family Welfare, Government of India (*extreme right*) and Dr Margaret Chan, Director General, WHO, inaugurating the India Herbal Garden

The Government of India,

through the Ministry of Health & Family Welfare, way back in 2003-04, had made a commitment to WHO to set up India Herbal Garden at WHO (Hq), Geneva. Later on, this responsibility was rendered to NBRI in the year 2006. The idea

behind setting up the herbal garden was to popularize the usage of Indian plants in health care worldwide, as the garden was to be set up in the premises of world's top health related international organization. The garden has 24 beds, adjacent to the India Room at WHO (HQ), having herbs, used in Indian System of Medicine.

On the occasion of its inauguration, the Minister released a leaflet, prepared by NBRI, describing the background of the garden, its layout and short details of the herbs, including their usage.

Speaking on the occasion, Dr M. Chan, who herself is a Herbalist, thanked the Indian Government for developing and donating the India Herbal Garden to WHO. She also



The India Herbal Garden



Drs A.K.S. Rawat and S.K. Tewari with WHO Team at the India Herbal Garden

appreciated the hard work and efforts of NBRI in setting up the Garden.

The Health Minister emphasized the future prospects of India's rich biodiversity and traditional knowledge in grabbing the fast increasing global herbal market. He said that this garden, set up at WHO will have long term future prospects in popularizing the Indian system of medicine and herbal industry globally. Drs A.K.S. Rawat and S.K. Tewari, Scientists, NBRI who were also present on the occasion, briefed the august gathering about the propagation and medicinal uses of the herbs, planted in the garden. The officials including Permanent Representative and Deputy Permanent Representative from Permanent Mission of India to the United Nations were also present on the occasion.

CECRI: Processes Licensed and Patents Filed/Granted

THE processes licensed and patents filed by and patent granted to the Central Electrochemical Research Institute (CECRI), Karaikudi, during January — June 2007 include:

Processes Licensed (process, licensee)

- Decorative yellow and white bronze electroplating, M/s KM Gadia & Sons, Bangalore
- Magnesium silver chloride seawater activated battery, M/s Tirven Industries, Hyderabad
- Electrolytic defluoridation of drinking water, M/s Sandur Fluid Controls Private Limited, Bangalore

Patents Filed in India (invention, inventors)

- Preparation of l-aminianthroquinone derivatives useful as novel corrosion inhibitors for petroleum products transporting pipelines, N. Palanisamy, P. Subramanian, S. Maruthamuthu, S. Mohanan
- Development of a digital and embeddable sensor for quantitative prediction of chloride ion, S.P. Manoharan, H. Dolli, J. Kennady, M. Ramakrishnan, A. Veluchamy
- An improved process for the electrochemical preparation of benzaldehyde from benzyl alcohol, T. Raju, K. Kulangiappaar, M. Anbukilandainaathan, A. Muthukumaran
- Development of conducting paint for aerospace applications, S. Azim, R.H. Sureshababu, G. Venkatachari
- An alternative proton conducting polymer electrolyte membrane and its application to fuel cells, A.K. Shukla, S. Pitchumani, P. Sridhar, A.K. Sahu, G. Selvarani, P.S. Khadke

Patent Granted in India

- A process for the preparation of an improved zinc-alloy useful for making improved galvanic anodes and a process for making improved galvanic anodes therefrom, D. Mukherjee, G.T. Parthiban, N. Palanisamy, N.S. Rengaswamy, Pat. No 199592.

Computer-controlled Vibration Test Facility at NAL's Structures Division

A state-of-the-art Computer-controlled Vibration Test Facility (CCVTF) has been installed at the Structures Division of the National Aerospace Laboratories (NAL), Bangalore. The newly acquired LDS V875 CCVTF was inaugurated by Dr A.R. Upadhyya, Director, NAL, at a simple function on 27 May 2007.

In his welcome address, Dr S.

Viswanath, Head, Structures Division, brought out the need for such a facility to cater to civil aircraft and other development programmes of the laboratory. He also highlighted the utility of the system in dynamic qualification of non-aerospace systems like automobile components, electronic equipment, etc. He also listed out a number of users who seek NAL's expertise in this area and the facility.

Dr A.R. Upadhyya after declaring open the CCVTF, recalled how Structures Division has in the past addressed problems of structural dynamics. He stressed the need for qualifying the newly developed LRU's according to relevant standards and complimented the Scientists of Structures Division in taking the initiative in setting up the facility.





IICT Foundation Day

THE Indian Institute of Chemical Technology (IICT), Hyderabad, celebrated its 63rd Foundation Day on 5 August 2007. It was on this day in 1944 that the Nizam of Hyderabad signed a *Firman*, establishing Central Laboratories for Scientific & Industrial Research (CLSIR) in the Osmania University campus to undertake research on natural resources of the erstwhile state of Hyderabad, such as oil, coal and ceramics. This laboratory became Regional Research Laboratory, Hyderabad in 1956 and later it was re-christened as Indian Institute of Chemical Technology in 1989.

Prof. Andrew David Miller, Professor of Organic Chemistry and Chemical Biology and Director, Genetic Therapies Centre, Department of Chemistry, Imperial College, London was the chief guest and delivered the Foundation Day Lecture on 'Whither Synthetic Non-Viral Vectors in Gene Therapy'.

Prof. Miller in his lecture pointed out that gene therapy could be a boon for patients suffering from deadly diseases like Hepatitis-B,

lung cancer, etc. The treatment is basically about effective delivery of a nucleic acid to the cell. Since nucleic acids are high molecular weight compounds, their delivery has to be done through some good carriers/vectors. Lack of good virus-based vectors was hampering efficacy of the therapy and more than 1000 clinical trials have gone waste. To overcome this, efforts are on to use non-viral vectors to combat Hepatitis-B and this has

shown promising results. Prof. Miller informed the gathering about the breakthrough in this area, stating that encouraging results are coming in tackling ovarian and cervical cancer. He further said that newly created Foundation for Global Biomedical

Solutions was making efforts to forge partnerships between laboratories in developed and developing countries for adopting a novel approach to treat diseases such as malaria, tuberculosis, HIV and Hepatitis-B.

Earlier, Dr J.S. Yadav, Director, IICT, highlighted the achievements of his institute during the past one year. He said that the institute was gaining greater heights day by day; as evident from the external cash flow (ECF) of Rs. 32.80 crore during 2006-07 — highest amongst the chemical sciences group of laboratories.

The chief guest presented the annual awards to the staff members. These included Shields (Team Award), Individual Awards (Certificates and Medals), IICT Gaurv Sanman 2006-07, Individual SRF Awards and IICT Appreciation Awards. Names of two scientists were added to the IICT Roll of Honour for their extraordinary



Dr J.S. Yadav, Director, IICT, presenting the silver plaque to Prof. Miller, the speaker of the IICT Foundation Day Lecture-07



Students being explained the activities of IICT



achievements. Dr Manika Pal Bhadra and Dr Narahari Sastry, Scientists, Organic Chemistry-I Division were added to the Roll of Honour by virtue of their receiving the Wellcome Trust Senior Research International Fellowship and DST Swarnajayanti Fellowship 2005-06, respectively. Later 'Prerana Group' — a cultural organization comprising staff members of IICT, presented a variety entertainment programme for the staff and guests.

Open Day

Prior to the Foundation Day Celebrations, IICT observed 'Open Day' on 3 August 2007 to generate awareness about the R&D activities among the general public and to inculcate scientific temper amongst school students, inspiring them to go for science studies in the higher curriculum.

About 2500 students from 25 schools and a few colleges visited the institute. They were taken round the campus to have a glance at the research projects on diverse areas like Bio-diesel, Chemical Informatics and Biotechnology, Integrated Pest Management, Coal, Gas and Energy, Organic Coatings and Chemical/Design Engineering. They were explained the activities through colourful charts, exhibits and working models spread all over the laboratory. A documentary film showing the exploits of IICT was run continuously. Students raised queries and got many of their doubts on various aspects clarified from research scholars manning the different project. Media persons were also invited and there was a very good response.

CECRI Foundation Day Lecture



Prof. A.K. Shukla, Director, CECRI, welcoming Dr N. Lakshmanan, Director, SERC, Chennai (seated) who delivered the CECRI Foundation Day Lecture

THE Central Electrochemical Research Institute (CECRI), Karaikudi's 59th Foundation Day Lecture was delivered by Dr N. Lakshmanan, Director, Structural Engineering Research Centre (SERC), Chennai, on 'Engineering Problems and Innovative Solutions'.

In his lecture, Dr Lakshmanan lauded the accomplishments of CECRI and also cited some of the major achievements of his own institute. He said that the conversion of Pamban rail bridge between Pamban and Mandapam, which links Rameshwaram Island to the main land, from metre gauge to broad gauge, is an example of latest structural engineering techniques. The SERC played a major role in modifying the 95 year old structure. Adopting the structural modification techniques, the existing bridge was upgraded without any change in the structure by providing extra weights. The job was completed with a few crore rupees.

The construction of concrete basement for 500 MW turbo generator at Talcher in Orissa is another example of the SERC's success. The task had been pending for nearly five years. SERC has also studied the impact of earthquake on massive concrete structure at the atomic power plant in Kalpakkam. A novel convolution and de-convolution technique was adopted for the study, informed Dr Lakshmanan.

Earlier, Prof. A.K. Shukla, Director, CECRI, welcomed Dr Lakshmanan and the audience. Shri S. John, Deputy Director, proposed a vote of thanks.



Application of Genomics Towards Newer Drug Development Indian Pharmacological Society's Conference at IICT

THE Indian Pharmacological Society organized a two-day Southern Regional Conference during 25-27 July 2007 at Indian Institute of Chemical Technology (IICT), Hyderabad, under the Chairmanship of Dr J.S. Yadav, Director, IICT. Dr Y.S. Rajasekhar Reddy, Chief Minister of Andhra Pradesh, inaugurated.

Welcoming a large gathering of delegates, scientists and academicians, Dr Yadav said that IICT was one of the oldest premier scientific organizations of the country, involved in solving the problems of Andhra Pradesh and serving on the whole the people of India. Informing about some of the recent accomplishments of the institute, he said, IICT has come out with a remarkable enzymatic degumming technology for the physical refining of rice bran oil which provides high nutritive benefits due to the presence of a variety of nutraceuticals with high contents of anti-oxidants. This technology has been released to four industrial outfits in Andhra Pradesh and to 27 industrial units in the country as a whole. IICT has taken up a prestigious project on production of bio-diesel from *Jatropha* and *Karanja* seeds, under the sponsorship of the Government of Andhra Pradesh and other collaborators and developed a process for production of biodiesel



Dr Y.S. Rajasekhar Reddy, Chief Minister of Andhra Pradesh, releasing the Souvenir at the inaugural function of Indian Pharmacological Society's Conference at IICT. Dr J.S. Yadav, Director, IICT, is seen second from right

at 1 kg/h scale from multi-feed stock. Additionally, with the support of A.P. Government, IICT is establishing a Biotechnology Incubation Centre in Hyderabad for carrying out advanced research in the field of biotechnology and to help the industry in and around Hyderabad. Also, IICT has taken up a number of projects for public welfare in A.P., such as setting up of defluoridation plant for providing potable water in Nalgonda district and upliftment of tribal people of Srisailam forest area.

Dr Y.S. Rajasekhar Reddy, the Chief Guest, lauded the institute's contribution towards the uplift of rural poor and assured that the Government of Andhra Pradesh

would never be found wanting as far as the investments in the field of science and technology are concerned.

Dr C. Adithan, President, Indian Pharmacological Society, spoke about the theme of the conference: 'Application of Genomics Towards Newer Drug Development', emphasizing the importance of areas such as Pharmacogenomics, Nutrigenomics and Toxicogenomics. He said that knowledge on genomics has opened up a new venue for development of newer drug targets and safer drugs. The drug development based on genetic profiles of the population would strengthen the safe drug

development process and help reduce time and cost involved in drug development.

Important areas such as translational medicine, pharmacokinetics, drug discovery, success and failures of herbal drug discovery, Indian clinical research, human resources for clinical research and rules and regulations for conducting clinical trials were addressed to by eminent personalities from academia and industry. A significant feature of the conference was honouring the pioneers in the area of pharmacology in the country. About 300 delegates comprising teaching professionals from academic institutes, researchers in chemical and biological sciences and industry participated in the conference.

For the benefit of students and researchers, a workshop on Biostatistics, Pre-clinical Toxicity Studies, Pharmacological Screening and Good Clinical and Laboratory Practices was also arranged.

National Workshop on Biofuels: Production Methodologies, Utilization Techniques and Challenges Ahead

THE Mechanical Engineering Research and Development Organization (MERADO), Ludhiana, organized the title workshop during 22-23 March 2007. Attended by around 50 participants, the workshop had six invited lectures and 16 research papers' presentation. The invited lectures covered different aspects of biofuels, from cultivation practices to application strategies. Dr T.K. Bhattacharya, Department of FMPE, GBPUA&T, Pantnagar, in his lecture narrated his experiences with aqueous ethanol substitution in CI engines. Dr Arup Ghosh, CSMCRI, Bhavnagar, gave deliberation on agronomic practices for *Jatropha* crop. Environmental concerns of biofuels were covered by Dr (Smt) Anjali Srivastava, NEERI ZLC, Kolkata and Dr D.C. Joshi, Dean, AAU, Anand, presented various aspects of post-harvest system of *Jatropha* for biofuel production. Dr Sanjay Mande, TERI, New Delhi and Dr G.P. Govil, GCE&T, Greater Noida, discussed various aspects of decentralized power generation in villages and biogas conversion kit for diesel engine.

The research papers covered various topics like cultivation practices, business plan for biodiesel production, fuel quality analysis, different types of methyl esters, etc. Best Presentation in the Ph.D. students' category was awarded to Shri Akhilesh Kumar, IIT, Kharagpur, for his work on rice bran methyl ester. The proceedings of the

workshop have been brought out covering all the full length papers under the guidance of Dr Pradeep Rajan.

An exhibition of biofuel related inputs and processing machinery and equipment for testing was also organized on the occasion. Exhibitors were, in addition to MERADO, M/s International Tractors Ltd, Hoshiarpur and M/s Medors Biotech Pvt Ltd, New Delhi.

The prominent organizations who deputed their delegates to the workshop are IARI, New Delhi; M/s International Tractors Ltd, Hoshiarpur; CIPHET, Ludhiana; CRIDA, Hyderabad; Delhi College of Engg; AMU, Aligarh; CSWCRTI, Dehradun; IGKV, Raipur; TNAU, Coimbatore and ITRC, Lucknow. The delegates also included farmers, students, and representatives from NGOs and industry.

Dr K.S. Aulakh, Vice Chancellor, Punjab Agricultural University, Ludhiana, was the chief guest, who in his inaugural address stressed the need of appropriate technological models and strategies for popularizing the biofuel production. He also spoke about the concerns over utilizing arable land for cultivating *Jatropha*. More collaboration between the stakeholders is essential for evolving the entire value chain of biofuel/biodiesel production system — from cultivation practices, harvesting, oil extraction to the final esterification process.

Cdr. V.R. Dahake, Scientist In-



charge, MERADO, in his welcome address spoke about achievements and activities and future vision of MERADO. Dr K. Kundu, Organizing Secretary, presented the role of MERADO in the field of biofuels and its future plan in this direction.

Shri S. Salman Mojiz, Scientist & Head, Business Development Group, while proposing a vote of thanks emphasized the need of synergizing the efforts to make major contributions to tap the India's potential to produce nearly 60 million tonnes of bio-fuels annually. For true energy independence, a major shift in structure of energy source from fossil to renewable energy source was needed, he stressed.

Workshop on Grassroot Innovations at IIP



Workshop on Grassroot Innovations at IIP in progress

THE Indian Institute of Petroleum (IIP), Dehra Dun, organized a workshop on Grassroot Innovations on 23 July 2007. The objective of the workshop was to bring grassroot innovations to the limelight. In our country, there are a large number of people who are not well educated or financially very sound but still have a very rich traditional knowledge. Some of them have given practical shape to their knowledge as grassroot innovations in different areas including herbal treatments, mechanical engineering, energy technologies, nutraceuticals, etc. However their innovations generally remain unaugmented due to lack of support from the organized sector.

The programme was organized by the National Innovation Foundation, Ahmedabad, an autonomous society with a corpus fund from the Department of Science and Technology, Government of India and institutional support from the Indian Institute of Management (IIM), Ahmedabad. The raison-detre of NIF is to unleash the true potential of innovators and traditional knowledge experts at grassroot level who are economically poor

but knowledge rich, who could neither have the privilege of formal education nor could mobilize any support required in augmenting their knowledge from organized sector. NIF helps such grassroot innovators by recognizing, respecting and rewarding their creativity. NIF scouts their innovations, helps in nurturing them and finally scaling them up in the form of commercial enterprises. Under NIF, its regional unit Grassroot Innovation Augmentations Network (GIAN), in collaboration with State Governments of the region, works as the technology incubator to bring innovations and investments together in order to create viable enterprises.

CSIR helps in evaluation of such innovations and devices and explores further scope of improvement. The petroleum and energy related devices are sent to IIP, a constituent laboratory of CSIR at Dehra Dun.

The workshop was inaugurated by Shri Indrajeet Khanna, Chairman, GIAN-North and State Election Commissioner, Rajasthan. Shri Khanna said that NIF has so far collected 65,000 innovations from 450

districts of the country, and honoured 302 grassroot innovators in the competition organized by it. So far 139 patents have been filed out of which 3 in USA and 23 in India have been granted. Based on these innovations, 28 technologies in India and one technology in USA have been transferred. Dr Khanna expressed the hope that in future also NIF and GIANS would continue to play important role in bringing such talents to the limelight.

In addition to Shri Khanna, prominent guests to the workshop included: Smt. Vibha Puri Das, Principal Secretary, Uttarakhand; Dr Rajendra Dobhal, Director, Uttaranchal State Council for Science & Technology, Uttarakhand; Dr R M Singhal, Principal Co-ordinator, Rural Technology Action Group (RuTAG); Shri Rajeev Kumar Singhal, Chief Innovation Manager, GIAN-North.

In the welcome address Dr M. O. Garg, Director, IIP, said that IIP is equipped with all necessary infrastructures for the evaluation of petroleum and energy related products and appliances. He said that this is the first time



Display of the innovative products

such a workshop was being organized at IIP and assured full support of the IIP scientists in evaluation of innovations and suggestions for further development work on these so as to commercialize the same.

Shri Rajeev Kumar Singhal gave a presentation on activities of NIF. He said that through such workshops the grassroot innovators get a chance to interact with the scientists which helps them in

improving their ideas.

Shri Umesh Kumar Jaiswal, Scientist, IIP, who conducted the workshop, informed that a total of eight innovations have been received by IIP. Most of there are related to the appliances (stove, *chulha*, etc.) used in kitchen. He said that the innovators are from Kerala, Gujarat, Maharashtra, UP and Delhi. Following are the details of the innovations:

S. No.	Innovator	Innovation
1.	Shri Nirajan Prasad Sharma, Pilibhit, UP	<ul style="list-style-type: none"> • Stove which operates on kerosene and water • Stove which operates on kerosene and gas
2.	Shri Sarvesh Kumar Sharma, Pilibhit, UP	<ul style="list-style-type: none"> • Dosa burner
3.	Shri Agastya Narayan Shukla, New Delhi	<ul style="list-style-type: none"> • Safety valve for pressure stove
4.	Shri Bharat Agravat, Joonagarh, Gujarat	<ul style="list-style-type: none"> • Improved stove (<i>chulha</i>) which operates on firewood
5.	Shri (Late) Safruddin Qazi, Gujarat	<ul style="list-style-type: none"> • Kero-gas stove
6.	Shri Uttam Sambhu Bhai Patil, Maharashtra	<ul style="list-style-type: none"> • Match sticks made from jute
7.	Shri G. J. Joes, Kerala	<ul style="list-style-type: none"> • Multipurpose stove (<i>chulha</i>)



Speaking on the occasion, Smt. Vibha Puri Das observed that traditional knowledge available in the state needs to be documented and in addition to the innovations, the novel practices being used in the state also need to be recognized. All such innovations of the state should be available at one place.

Dr Rajendra Dobhal stressed on the need of patenting such innovations. He said that more workshops are required to create an awareness on the importance of protecting the innovation by IPR. Dr R. M. Singhal, informed that RuTAG is working to select the technologies suitable for the development of rural masses. The technical support to the innovations from various research organizations and RuTAG provide the financial support to them.

The Scouts and Volunteers of GIAN-North shared their experiences related to collection of such innovations. The innovators displayed their prototypes and explained their special features.

Shri Jaiswal expressed that in association with the innovators the prototypes would be evaluated in the next two days and suggestions for improvement would be given.

Seminar on Pollution Abatement and Effluent Control



Seen on dais during the seminar on 'Pollution Abatement and Effluent Treatment' (from left) are: Dr A.C. Kunwar, Dr Vara Prasad, Dr A.V. Rama Rao and Shri A. Krishna Reddy

THE Indian Institute of Chemical Technology (IICT), Hyderabad, organized a seminar on 'Pollution Abatement and Effluent Treatment' on 30 July 2007 in honour of Shri A. Krishna Reddy, Deputy Director and Head, Pilot Plant Division, who retired on superannuation on 31 July 2007 after rendering 29 years of service to CSIR.

The seminar was inaugurated by Shri Vara Prasad, Senior Advisor, BDMA and Member, A.P. Pollution Control Board. A well known expert in the field of pollution control and green technologies, In his inaugural address, Shri Prasad said that after globalization and economic liberalization, there has been great emphasis on adopting latest eco-friendly technologies, energy conservation system, artificial intelligence and logic control operations in the critical areas for the plant and maintenance. However, while companies and corporations

were racing towards information technology and software management, there was still a big vacuum in the field of pollution free, clean and green production oriented technologies. Hence, there was an immense need to have clean technologies that can be effectively, economically and easily adopted by the manufacturers.

Dr A.V. Rama Rao, former Director, IICT and CMD, AVRA Laboratories Pvt. Ltd, in his keynote address, spoke about the importance of effluent treatment in the chemical industry and said that after the implementation of different acts like Water (Prevention and Control of Pollution) Act, 1974; Air (Prevention and Control of Pollution) Act, 1981 by the A.P. Pollution Control Board, it was imperative for the chemical industry to go for the effluent treatment facility. He called the young and energetic scientists and chemical engineers to search for

newer processes and products with minimum pollutants.

Dr J.S. Yadav, Director, IICT, who presided over the function, said that Shri Krishna Reddy successfully took up R&D work related to difficult technologies, usually associated with hazardous chemicals and handling of these either as raw material or as finished product. He had excelled during the development of technology on pilot scale for cyanuric chloride.

Other important speakers of the seminar were Prof. M. Bhagavant Rao, former Professor, Osmania University; Dr Y.R. Akella, Executive Vice President, PETL, Hyderabad; Dr P. Eshwar Reddy, CEO, Ramkey, Hyderabad and Dr T.R. Kolanu, Co-ordinator, Stanford University, USA. About 50 participants from the industry, academic institutes and CSIR laboratories participated.

STRATEGIES FOR INNOVATIVE LEADERSHIP

Fourth NISTADS Silver Jubilee Lecture by Dr R. Chidambaram Principal Scientific Adviser to Government of India

DR R. Chidambaram, Principal Scientific Adviser to Government of India, and Chairman of Scientific Advisory Committee to the Cabinet, and Technology Information, Forecasting, and Assessment Council (TIFAC), delivered the Fourth lecture in the Silver Jubilee Lecture series of National Institute of Science, Technology And Development Studies (NISTADS), New Delhi, on 24 August 2007. The theme of the lecture was 'Strategies for Innovative Leadership'

In this lecture Dr Chidambaram stressed the need for 'Coherent Synergy' in India's S&T efforts to help put India on a sustained fast growth path. That India will be a developed nation, there is no doubt. The question is, Dr Chidambaram said, how fast shall we realize this goal. And for India to become a developed nation soon, we need to evolve innovative strategies and achieve competitiveness globally. Dr Chidambaram pointed out that there are no technological specifications for becoming a leader in any field; the only yardstick is that others should recognize one as a leader.

There are various indicators that show how advanced, how developed a nation is, e.g. GDP, per capita electricity consumption, average life expectancy, mortality rate, percentage of literacy and so on. Of these, Dr Chidambaram opined, per capita electricity consumption and the percentage literacy are more important indicators in the present day scenario where knowledge and innovation are the main driving force of development. He further said, We have to be

economically developed, scientifically advanced and militarily strong. There was a time, when USA and UK used to get Nobel Prizes and Japan used to make money. But now Japan is stressing on basic research. China is stressing on basic research. Fortunately India somehow has always been on the right path and paying attention to basic research all the time. However, today's main problem all over the world is to attract best talent to science as other sectors, e.g. Finance Management, are becoming more lucrative. We have to evolve strategies to make science careers more attractive, create cyber connectivity, grid computing to pool our intellectual resources to enhance the velocity of R&D.

Citing the history, Dr Chidambaram said that at one time violence determined the winner. From violence we came to wealth as the deciding factor and then knowledge power and innovation. History shows that India always had very good warriors but wherever we lacked technology, we lost. So deterrence is important. Technology is important and to generate it knowledge is important and innovation is important and also important is the IPR. We must become self-reliant and wherever needed, go for equal partnerships. All this requires technology foresight. Citing the example of Fast Breeder Reactor (FBR) technology, Dr Chidambaram said Russia, France, etc. were leaders in nuclear power. Tomorrow we may become leaders.

We should go for value addition so that in short-term we may need others



but in long-term they would need us.

Stressing on the need for an effective interface between academia and industry, Dr Chidambaram said that while academia had capital 'R' (i.e. strong in research) and small 'd' (i.e. not so strong in development) industry had small 'r' and capital 'D' and together they can accelerate pace of growth in a big way. Major weakness in the Indian context was the rural development and this required altogether different strategies as compared to those for industrial development. Money was not a constrain, the major problem was of delivery. We require effective strategies that will enhance production, bring about value addition and make the rural India prosperous.

Addressing the climate change issue, Dr Chidambaram pointed out that there is not sufficient fossil fuel available all over the world that will enable India and China to have the same per capita energy consumption as in the west. So we have to look for other energy sources that are clean and meet our demand.

We have to go for coherent strategies that will enable us to move at a much faster pace, transform India into a developed nation and make us leader in chosen fields, concluded Dr Chidambaram.

Earlier, Dr P. Banerjee, Acting Director, NISTADS, who presided over the function, welcomed the distinguish speaker and introduced him to the audience.

First Meeting of Max Planck Society, Germany - India Partner Groups



Seen on the dais during the inaugural meeting (from left) are:
Dr Felix Kahle, Prof. David Heckel and Dr S. Sivaram

THE National Chemical Laboratory (NCL), Pune, organized a three-day meeting between Max Planck Society, Germany - India Partner Groups and representatives of Indian funding agencies such as CSIR, DST, DAE and MHRD during 15-17 July 2007. The meeting was arranged to discuss the research

projects funded by Max Planck Society, exchange scientific knowledge, identify areas of mutual interest and develop new programmes to enhance the bilateral research programmes between India and Germany.

The meeting was attended by scientists from several Max Planck Institutes (MPI), including Prof.



Max Planck Society, Germany - India Partner Group members along with Max Planck Society officials



David Heckel, Director of Max Planck Institute for Chemical Ecology, Jena; Dr Felix Kahle, Programme Manager, Max Planck Society; Dr Silke Rathgeber, Project Leader, Max Planck Institute for Polymer Research, Mainz and Dr Himadri Gupta, Research Group Leader, Max Planck Institute of Colloids and Interfaces, Golm (Postdam), besides leaders/representatives of partner groups from Indian institutions such as TIFR, Mumbai, IITs at Delhi and Roorkee, JNCAS, Bangalore and NCL.

Dr S. Sivaram, Director, NCL and Prof. David Heckel initiated the scientific session on 16 July with welcome remarks. Later, Prof. Heckel gave a lucid presentation on 'Frontiers in the chemical ecology of insect-plant interactions'. Subsequently, Dr Naveen Garg from IIT, New Delhi, presented a general overview on the activities of Max Planck Partner Groups. This was followed by a series of talks highlighting the current project status presented by the respective heads of each Indian partner groups. A visit to the various lab facilities at NCL was also arranged.

On the third and concluding day of the meeting, a programme by leading scientists from the biological, material and polymer sciences was arranged besides the presentations by distinguished scientists from MPI. In the category of biological sciences, Prof. David Heckel addressed the meeting on 'Mechanisms of resistance by insects to *Bacillus thuringiensis* toxins' and Dr Vidya Gupta from NCL gave a talk on 'Plant proteinase inhibitors to control lepidopteran insect infestation: A strategy'. Later, Dr Hemadri Gupta and Dr K. Vijayamohan spoke on 'The involvement of cooperative deformation, temperature activated plasticity and lamellar springs in bone micromechanics' and 'Electron transfer behaviour of hybrid materials: Nanoclusters, nanowires, Y junctions and network structures', respectively covering material sciences. During post-lunch session under the polymer sciences category, Dr Silke Rathgeber spoke on 'Highly branched polymers: from fundamentals to applications questions and discussion' while Dr Ashish Lele from NCL talked on 'Bridging polymer dynamics and polymer processing'.

The meeting concluded with a vote of thanks from the organizing secretary Dr Ashok Giri, NCL, who summarized the scientific sessions.

Dr S. Shivaji selected as a Member of India's First Expedition to the Arctic

DR S. Shivaji, Director-Grade Scientist, Centre for Cellular and Molecular Biology (CCMB), Hyderabad, has been selected as a Member of India's First Expedition to the Arctic, the northern end of the Earth.



Dr Shivaji has earlier visited Antarctica twice along with the Indian delegation in 1984 and with the US expeditionary in 1995 and is now visiting the North Pole. He had discovered several new species of microbes from Antarctica and identified genes required for the growth and survival of life forms at freezing temperatures. His main interest is centered around microbes from extreme habitats such as Antarctica, Himalayan glaciers, deep sea, stratosphere and now, the Arctic. His overall aim is to define the limits of life with respect to temperature, to understand the survival capabilities of life forms at extremes of temperatures such as below the freezing point and above the boiling point of water and also to find relationship between organisms, which are separated geographically by enormous distances.

Dr Shivaji would like to explore the possibility of using Arctic microbes as workhorses of biotechnology. To this end he would be conducting investigations on Arctic microbes to establish their identity, to understand their dynamics in the environment and to identify unique bioactive molecules with immediate application in the industry. Microbial biodiversity has become extremely important due to the associated biotechnological potential of the microorganisms, which could be utilized for the betterment of mankind with their ability to synthesize biomolecules of use in medicine and agriculture. The delegation left New Delhi on 3 August 2007 and reached Arctic via Oslo on 6 August 2007.



Dr A.P. Mitra, FRS, passes away

1965 and then Middle Atmosphere in eighties and IGBP in nineties

Dr Mitra introduced tropospheric radio research in India in the 1970s, and made significant contribution to major improvements in radio communication capabilities in the country. He initiated new experimental techniques for ionospheric and tropospheric monitoring, developed an ionospheric prediction system that supported broadcasting and point-to-point communication systems over the past three decades, provided reference data base for radio communication over frequencies from VLF to microwaves, developed a scientific base for troposcatter design and performance analysis and for estimation of radar target errors, established an International Radio and Geophysical Warning Centre serving India, Middle East and South East Asia, and established one of the most extensive radio flare detection systems.

His studies on atmospheric chemistry, greenhouse gases and ozone depletion, and global environmental chemistry have had international impact. He led global change science programme in India and South Asia, Indian programme for INDOEX, Indian component of ALGAS Programme (in association with TERI), Methane Asia Campaign 1998, etc. New programmes that had his involvement include: Megacities and Greenhouse gas emissions (a programme of Asia Pacific Network), Climate Change and Human Health (India-UK Programme), UNFCCC related GEF activities, a synthesis report on South Asian Global Change Science for IGBP, etc.

As CSIR Director General he emphasized on a close interaction between research, academia and industry to pool the resources for the advancement of knowledge and development of

technologies for the nation's growth.

Dr Mitra was President of URSI during 1984-87 — the first Indian and second Asian to be elected to this high office. He was a member of the General Committee of ICSU, 1984-88 and in addition, was associated with several policy-making bodies. He served COSPAR in various capacities; was Chairman, National Committee for International Union of Geosphere-Biosphere Programme (1991-94); Chairman/member of START-SASCOM and Director, SASCOM-RRC; Chairman, Indian Advisory Committee on Space Sciences; Chairman, Governing Council of National Council of Science Museums; Member, Advisory Committee on Climate Change, Ministry of Environment and Forests; Chairman, SAC - NMRF; Bureau Member in ICSU Scientific Committee on Solar-Terrestrial Physics; Member, Council of United Nations University; Member, Scientific Planning Group, Asia Pacific Network. Advises Ministry of Environment and Forests on Global Environment.

The large number of prestigious awards won by him include: Shanti Swarup Bhatnagar Prize for Physical Sciences (1968), Sir K. S. Krishnan Memorial Lectureship of INSA (1975), C. V. Raman Award of UGC (1982), FICCI Award for Physical Sciences (1982), Jawaharlal Nehru Fellowship (1978-80), Om Prakash Bhasin Award for Physical Sciences (1987), Meghnad Saha Golden Jubilee Award of Indian Association of Science (1991), Modi Science Award (1992), Meghnad Saha Medal by Asiatic Society (1994), S.K. Mitra Centenary Medal by ISCA (1995), Senior Homi Bhabha Fellowship (1966-98). He was Fellow of the INSA, IASc, NASc; TWAS and International Academy of Astronautics; past president, NASc and Secretary, INSA (1979-82), and INSA Council Member (1994-95).

CSIR News records with deep sorrow the sad demise of Dr Ashesh Prasad Mitra, FRS — an internationally renowned climate scientist and former Director General of CSIR, on 3 September 2007.

Born on 21 February 1927 in Kolkata, Dr Mitra did his D.Phil. in 1955 from the University of Calcutta under the supervision of late Prof S.K. Mitra, FRS, a pioneer in ionospheric and related atmospheric research. He joined National Physical Laboratory (NPL), New Delhi, in 1954 and rose to become its Director in 1982. He was Director General of CSIR from 26 February 1986 to 16 April 1991. In 1989, he was awarded Padma Bhushan. Even at the age of 81 he was actively engaged in research as Scientist of Eminence at NPL, where he had set up the Radio Science Division in the early sixties, and where his recent efforts had led to the establishment of a 'Regional Facility on Radio Science for Development' (RFRS) in February 2007.

Dr Mitra will be remembered for his pioneering contributions to the field of earth's near-space environment through ground-based and space techniques. His work on cosmic radio noise for studying the upper atmosphere led to several new discoveries in ionosphere, solar physics and cosmic rays. He was the driving force for the Indian programme of the International Geophysical Year 1957-58, International Quiet Sun Year (IQSY) 1964-