

CSIR NEWS

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CSIR FOUNDATION DAY

Team CSIR

Celebration of Science.....

Prime Minister Dr Manmohan Singh presents:

- Shanti Swarup Bhatnagar Prizes for 2006
- CSIR Diamond Jubilee Technology Award 2006
- CSIR Award for S&T Innovations for Rural Development

Minister of Science & Technology and Earth Sciences

Shri Kapil Sibal, presents:

- CSIR Young Scientist Awards 2006
- CSIR Technology Awards 2006

and releases

- 'GENO-CLUSTER', bioinformatics software
- Compendium entitled 'Contributions of CSIR to Antarctic Research: Collected Reprints'

Dr R. A. Mashelkar,

Director General, CSIR, presents:

- CSIR Diamond Jubilee Invention Awards-2006 for School Children.

Screening of the film "Science Safari" — a film highlighting the innovative and path breaking achievements in Science and Technology in India

"Best is yet to come"

Rich tributes to Dr R. A. Mashelkar, DG, CSIR,



"To Dr. Mashelkar, I have to say: You have served our country and the cause of science and technology with the greatest distinction. On behalf of our people and our Government, I wish to convey to you our grateful regards. We all are proud of your achievements but I conclude by expressing the hope and prayer that perhaps we have not seen the best of you still — the best is yet to come. May your life and work continue to inspire generations of scientists and technologists in our country."

— *Dr Manmohan Singh, Prime Minister of India and President of CSIR CSIR Foundation Day Lecture at Vigyan Bhawan, New Delhi 26 September 2006*



"Today, we find that CSIR's external cash flow exceeds Rs.340 crore per annum of which merely one-third is derived from the private sector....CSIR's performance is all the more creditable in view of the fact that the investment by Indian industry in R&D is a dismal half-a-percent or so of their sales turnover. Who brought about this transformation? The credit for this goes to Dr Mashelkar and the CSIR family."

"The credit for elevating CSIR to a position of such primacy must go to the painstaking efforts and perseverance of Dr Mashelkar who has over the years brought about patent literacy, competence building and management of IP."

- *Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences and Vice President, CSIR. Speech delivered during CSIR Foundation Day Celebration at Vigyan Bhawan, New Delhi, 26 September 2006*





CSIR Foundation Day Celebrations

Twenty-sixth September is a very special day for the Council of Scientific & Industrial Research (CSIR). It is the Council's birthday! It was on this day in 1942 the CSIR came into being. Every year, the 38 laboratories/institutes of CSIR, spread all over the country, celebrate this day with great pomp and gaiety. It is an occasion to celebrate the accomplishments of the year that has gone by and plan for the future—to serve the nation with still greater dedication. It is also an occasion to accord recognition to excellence in science through the presentation of awards and prizes. The main function, which is attended by a large number of eminent scientists and dignitaries, is held in New Delhi.

This year's Foundation Day celebrations in New Delhi had several unique features. First of all, three major functions were held instead of the usual single function. The functions were held at Vigyan Bhawan, Hotel Le Meridien and CSIR Headquarters. In fact, the whole day was full of celebration of best of science and best of technology. It saw the presentation of Shanti Swarup Bhatnagar Prizes (2006), CSIR Diamond Jubilee Technology Award (2006) and the newly instituted CSIR Award for S&T Innovations for Rural Development by Prime Minister of India and President, CSIR Dr Manmohan Singh; CSIR Young Scientist Awards (2006) and CSIR Technology Awards (2006) by the Minister of Science & Technology and Earth Sciences and



Prime Minister of India and President, CSIR Dr Manmohan Singh with the Minister of Science & Technology and Earth Sciences and Vice President, CSIR Shri Kapil Sibal (right) and CSIR Director General Dr R.A. Mashelkar at the CSIR Foundation Day Function in Vigyan Bhawan

Vice President, CSIR Shri Kapil Sibal; and the CSIR Diamond Jubilee Invention Awards for School Children (2006) by CSIR Director General Dr R.A. Mashelkar. Shri Kapil Sibal also launched 'Geno Cluster'— a bioinformatics software developed jointly by the Institute of Genomics and Integrative Biology and Jalaja Technologies under the New Millennium Indian Technology Leadership Initiative (NMITLI) programme and released a Compendium entitled "Contributions of CSIR to Antarctic Research: Collected Reprints. Science Safari, a film highlighting the innovative and path breaking achievements in Science and Technology in India — an initiative by Ministry of Science &

Technology and Earth Sciences and the National Geographic channel was also screened on the occasion.

Prime Minister Dr Manmohan Singh also delivered this year's CSIR Foundation Day lecture.

Dr Manmohan Singh and Shri Kapil Sibal in their addresses paid rich tributes to Dr Raghunath Anant Mashelkar, FRS, Director General, CSIR, for orchestrating the CSIR transformation into a user-focused and market-oriented scientific industrial organization, and the galaxy of eminent scientists attending the function gave a standing ovation to Dr Mashelkar.

Dr Mashelkar is due to lay down his office on 31 December this year.



CSIR Foundation Day Function at Vigyan Bhawan

Prime Minister presents Shanti Swarup Bhatnagar Prizes, CSIR Diamond Jubilee Technology Award and CSIR Award for S&T Innovations for Rural Development for 2006



The Foundation Day celebrations began with a glittering function held in the morning at Vigyan Bhawan, New Delhi. Attended by a host of dignitaries and eminent scientists, it was a celebration of CSIR's commitment to its mandate and rejoice the achievements of the past year.

Prime Minister of India Dr Manmohan Singh, who is also President of CSIR, presented:

- Nation's most coveted award in science & technology, the Shanti Swarup Bhatnagar Prizes for 2006 to thirteen eminent scientists for their outstanding research contributions.
- CSIR Diamond Jubilee Technology Award for 2006 to Tejas Networks India Limited, a Bangalore-based *innovation-driven company, for development of Next Generation Optical (SDH/SONET) Networking products and their successful commercialization from India.*
- Newly instituted CSIR Award for S&T Innovations for Rural Development to Central

Leather Research Institute (CLRI), Chennai, in recognition of its contributions to designing, developing and delivering effectively several critical technologies impacting positively the livelihood of a large number of people engaged in the Indian leather sector.

(Please see pp.296-299 for details about the awards, citations and response of the awardees)

Dr Manmohan Singh also delivered the CSIR Foundation Day Lecture *(for PM's lecture please see page 292).*

Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences and Vice President, CSIR, presided over the function and also addressed the audience *(for Shri Sibal's lecture please see page 294).*

Mementoes were presented to Prime Minister Dr Manmohan Singh and to Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences. Earlier, Dr R.A. Mashelkar, Director General, CSIR, had pointed out, to thunderous applause from the audience that it

was the birthday of the Prime Minister as well as the birthday of CSIR.

Dr Mashelkar announced the awardees and read out the citations.

Shri Sanjay Naik, CEO of *Tejas Networks India Limited*, sincerely thanked CSIR in his brief Acceptance speech and said that the Tejas team was honoured to receive CSIR Diamond Jubilee Technology Award for 2006 *(Please see pp.297-298).*

Announcing the first CSIR Award for S&T Innovations for Rural Development, Dr Mashelkar remembered the contributions of Dr T. Ramasami, former Director, CLRI and currently, Secretary, Department of Science and Technology, Government of India, who could not be present at the function. Dr A. B. Mandal, Acting Director and Dr S Naidu accepted the award on behalf of Team-CLRI. In his acceptance speech, Dr Mandal said that CLRI was honoured to receive the Award *(Please see pp.299).*

Dr Mashelkar also delivered the Vote of Thanks *(Please see pp.295).*



Prime Minister Dr Manmohan Singh's CSIR Foundation Day Lecture at Vigyan Bhawan

“I am very happy to be here today amongst a galaxy of scientists and each one of you are a nation-builder. I congratulate each of the awardees gathered here, and the staff and employees of the Council for Scientific and Industrial Research on the 64th Foundation Day of CSIR. As the President of CSIR Society, I am proud of the achievements of CSIR.

India can attain its rightful place in the comity of Nations and become a major pole of the evolving global economy only on the basis of a firm commitment to reason and rationality and the inculcation of what Jawaharlal Nehru used to describe as the scientific temper. Science and technology, therefore, have to be pace setters in our Nation's quest for a life of dignity and self respect for all our people and for us to attain our rightful place in the comity of Nations. I congratulate the winners of our most coveted science prize, the Shanti Swarup Bhatnagar Award. Since 1961, when Prime Minister Jawaharlal Nehru gave away the first of these prizes, these awards have acquired great prestige within the community of scientific researchers in our country.

I am heartened to learn that of the four hundred plus Bhatnagar prize winners, hardly any one have

left the shores of our country and seeking employment abroad. This is indeed really commendable. I hope this year's awardees will also dedicate themselves to the service of India through their commitment to the promotion of science and technology in our country.

I also take this opportunity to congratulate *Tejas Networks* and the Central Leather Research Institute. I understand that CLRI's work has influenced the livelihoods of about 1.4 million people in the Indian leather sector. May your example prove a pace setter in using science and technology to serve our Nation's goals and objectives.

What are the big challenges that Indian science & technology face today? On the supply side, we have to enhance the supply of skilled scientists and technologists. This needs to be done through a judicious balancing of 'expansion', 'inclusion' and 'excellence'. On the demand side, we have to promote 'technology-led accelerated inclusive growth'. Let me elaborate on these challenges.

Numbers is the first issue. I understand that we have only 157 scientists and engineers per million people involved in Research &



Development. Korea has 50 times more and United States and Japan have over 30 times more! Quality and output is yet another issue. In ten years, I have been told China has overtaken India in the number of scientific research papers published in the internationally peer reviewed journals. In fact they publish three times our numbers.

Our Government is determined to ensure an expansion of supply, demand and productivity in the area of Science & Technology. After a gap of a hundred years, we are now setting up three new Indian Institutes of Science, Education and Research (IISERs). Each of these institutes will be unique in terms of integration of science education and research.

Our best minds are not turning to science, and those who do, do not remain in science. This is a common refrain whenever I meet with the Scientific Advisory Committee to the Prime Minister. We must



therefore find ways and means of making these disciplines more attractive to our children and to our young. We have to redesign school and college education to build on the natural curiosity of our children.

We must also maintain the excellence of current institutes of higher learning, who have already been recognized globally. This can be achieved only through the recruitment of the very best faculty. We must create an environment conducive to the pursuit of excellence. It might appear that expansion, inclusion and excellence are mutually contradictory objectives. I do not think so. With determination and with some innovation, I am sure we can harmonize these objectives and this we must do.

The process of expansion must also be inclusive and relevant. Our real challenge seems to be to get the best minds in India to engage in providing practical pragmatic solutions to our many fold social and economic problems. Can you imagine the impact if we had a good vaccine for malaria? Can we imagine what impact a breakthrough in low cost fuel cells and photovoltaics for decentralized power supply can have on the life of our people? We must therefore find ways and means by which the best scientific minds in India could be ignited to tackle these basic societal challenges. Science & Technology have an enormous potential to enable us to meet the basic human needs of our people. We have therefore to make determined

efforts to harness the vast latent potential in full measure.

It's often said that we live today in an increasingly interdependent world in which science and technological knowledge is growing at an unprecedented pace. International cooperation in science and technology development therefore offers exciting opportunities in this globalised world that we live in. We need therefore coordinated international efforts to address common technological issues. Countries could cooperate in meeting the energy needs of the world; in tackling disease; in using technology for better education; and in meeting the food requirements of the growing population of the world. These are only illustrative examples. There could be many more. We need to explore mechanisms for making cooperative global efforts possible and relevant.

We ought to take note also of the growing privatization of science and technology in the advanced developed countries. Multinational corporations are playing today an increasing role in the generation of new knowledge in areas such as biotechnology, pharmaceuticals, information technology and energy. The challenge before the world community therefore is to find more pathways to sustain adequate incentives for the generation of new knowledge and simultaneously to make the fruits of this knowledge available at affordable prices to the poorer countries in the world. We need global action to harmonize these

twin requirements.

In this context, the international system for the protection of intellectual property rights needs to be adequately sensitive to both these concerns. Advances in science and technology have made a powerful contribution to globalization of the world economy. The challenge ahead is to ensure that the evolving global economy is so managed that it promotes the interests of all countries, rich and poor. Time is ripe to evolve concerted strategies to make globalization and the knowledge revolution that is propelling it a win win situation for the entire humankind. India ought to be in the forefront of intellectual efforts to find meaningful and purposeful solutions to these global concerns.

I wish to congratulate once again all the award winners who have distinguished themselves in their respective fields. I hope they will continue to be inspired to scale new peaks of excellence.

To Dr Mashelkar, I have to say you have served our country and the cause of science and technology with the greatest distinction. On behalf of our people and our Government, I wish to convey to you our grateful regards. We all are proud of your achievements but I conclude by expressing the hope and prayer that perhaps we have not seen the best of you still - the best is yet to come. May your life and work continue to inspire generations of scientists and technologists in our country."



Address by Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, at CSIR Foundation Day Function in Vigyan Bhawan



“It is indeed a privilege for me to welcome our respected Prime Minister to the CSIR Awards Function to do the honours. He has never hesitated to support the scientific community in its hour of need and has always recognized the centrality of science & technology in developmental processes. Thank you Sir for being with us today and thank you for your encouragement. This time around, the CSIR has introduced one more national award – that is for S&T Innovations for Rural Development reflecting the enhanced national concern for the disadvantaged sections of our society. The award is in addition to the two ongoing prestigious awards, the Bhatnagar Prizes in Science – that are hailed as India’s Nobel Prizes and the Diamond Jubilee Technology Award. My hearty welcome to all the awardees and their associates and friends. I see in front of me a galaxy of luminaries from the Indian S&T community – my sincere thanks to you for bestowing upon CSIR your blessings and good wishes. I also wish to welcome my friends from the media, who spread the much needed message of science and the achievements of our scientists, to our people.

Sir, it was exactly twenty years ago, in 1986, that Rajiv Gandhi, as President of CSIR labs was concerned with the disconnect

between CSIR laboratories and the utilisation of their outputs. He, therefore, ordered a review of the functioning of CSIR and its laboratories. As a result, Rajiv Gandhi directed CSIR to be more customer oriented and to raise one third of its expenditure from outside of government grants. This was meant not only to enhance earnings but to inculcate financial accountability and make CSIR responsive to customer needs. Rajivji also hoped that this would motivate other scientific establishments to the discipline of commercial accountability.

Sir, I must congratulate CSIR for realising in ample measure this expectation of Rajiv Gandhi. Today, we find that CSIR’s external cash flow exceeds Rs. 340 crore per annum of which merely one-third is derived from the private sector. Sir, you will concede that CSIR’s performance is all the more creditable in view of the fact that the investment by Indian industry in R&D is a dismal half-a-percent or so of their sales turnover. Who brought about this transformation? The credit for this goes to Dr Mashelkar and the CSIR family. It all started with his pioneering report on ‘Marketing of CSIR knowledgebase’ submitted while he was still with NCL. Taking over as Director General, CSIR he implemented it with vigour and

single-minded zeal. He successfully persuaded others to embrace the ideas of ‘market responsiveness’ and ‘customer satisfaction’ across the entire Indian S&T community. Today scientific institutions and agencies are vying with each other for raising external financial resources. A remarkable turnaround for Indian S&T.

As regards the utility of CSIR’s research outputs, it enjoys an enviable position globally amongst all publicly funded institutions particularly with respect to patents. I understand that its portfolio of over 1000 domestic and foreign live patents each is the highest in the world achieved by any publicly funded institution. Moreover, CSIR alone accounts for more than one-third of all of the US patents granted to Indian inventors so far.

The credit for elevating CSIR to a position of such primacy must go to the painstaking efforts and perseverance of Dr Mashelkar who has over the years brought about patent literacy, competence building and management of IP. The turnaround commenced ten years ago with Dr Mashelkar enunciating



the first ever Intellectual Property Management Policy, by any publicly funded R&D. Then came the victory for CSIR in the now famous 'Haldi (ghati) battle' at the USPTO; and more recently, with the international success in having 'Traditional Knowledge' included in the International Patent Classification System.

Remarkably the transformation of CSIR to a 'market responsive' organisation has not been at the cost of excellence in science, as has occurred with most other publicly funded organisations in Europe, Australia & Africa. In the past decade, CSIR's science output as reflected by the number of publications has more than doubled with the quality of papers also improving from the average impact factor of 0.85 in 1995 to over 2 in 2005, comparing favourably with the best of Indian academic institutions. This is no mean achievement.

Sir, what has surprised me even more is the bagging of the first ever CSIR Award for S&T Innovations for Rural Development by the Central Leather Research Institute of CSIR. Dr Ramasami is unable to be here amongst us, nonetheless I congratulate him and his erstwhile team of committed and dedicated scientists at CLRI who have helped the disadvantaged sections of our society to vastly enhance their earnings and improve their quality of life. This brings to light a little known facet of CSIR's work for the common man.

There is no doubt Sir, that with these all-round accomplishments CSIR is a much admired research organisation both in India and internationally. However, the nation has still higher expectations from CSIR. We would like to see CSIR being challenged to rise to much greater heights and excel its own performance. This is enunciated by Dr Mashelkar in his path setting White Paper on "CSIR 2021 : Vision & Strategy"; The nation would like to see the external cash flow of CSIR to reach the level of Rs. 700 crore/annum with earnings of \$ 40 million/year from foreign sources before the end of the Eleventh Five Year Plan. With committed leaders like Dr Mashelkar this is not beyond our grasp.

Once again, my hearty congratulations to the Awardees for their excellent achievements. You have done the nation proud. We all salute your success.

Vote of Thanks by Dr R.A. Mashelkar



Dr R.A. Mashelkar, FRS, Director General, CSIR, began by

pointing out, "*Today is a special day. What we are seeing is the best of science, the best of technology making a global impact and the best of S&T making a local impact.*"

He thanked Prime Minister Dr Manmohan Singh for gracing the function and for kindly consenting to give away the awards. He said that the tradition of the Prime Minister giving away the country's highest S&T honours has continued as an unbroken trend since 1996 to the present day. He recalled Dr Singh's instruction to him at their first meeting after Dr Singh had assumed office: "...make hi-tech work for the poor", and briefly mentioned the CSIR endeavors in this direction. In fact, Dr Mashelkar has delivered a popular lecture on this theme at various fora, including the Indian Science Congress, drawing keen interest of the audience to serve the poor.

Dr Mashelkar also thanked Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences for "bringing new life, energy and hope to science."

He announced that this was his last public function as DG, CSIR. He said, "As I step down ...I can only say that I have tried to do my very best to serve the nation and I hope that my best was good enough." He then repeated the words of the Prime Minister (who in his address on the occasion had said, "To Dr. Mashelkar, I have to say you have served our country and the cause of science and technology with the greatest distinction. On behalf of our people and our Government, I wish to convey to you our grateful regards. We all are proud of your achievements but I conclude by expressing the hope and prayer that perhaps we have not seen the best of you still - the best is yet to come....."), and said that he would continue to serve the nation and humanity till his last.



Shanti Swarup Bhatnagar Prizes

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

knowledge and progress — fundamental or applied — in the particular field of endeavour, which is his/her specialization. The prize is awarded on the basis of contributions made through work done primarily in India during the five years preceding the year of the prize.

Shanti Swarup Bhatnagar Prize-winners for 2006

Biological Sciences

Dr Vinod Bhakuni, Central Drug Research Institute, Lucknow: *Dr Bhakuni has made outstanding contributions to our understanding the role of noncatalytic structural*

domains and ionic interactions in regulating the functional activity of the catalytic domains in proteins.

Dr Rajesh Sudhir Gokhale, National Institute of Immunology, New Delhi: *Dr Gokhale's work has discovered a new family of long-chain fatty acyl-AMP ligases (FAALs) and has also elegantly elucidated 'biochemical crosstalk' between fatty acid synthases and polyketide synthases, which produce diverse unusual lipids of the complex cell wall of Mycobacterium tuberculosis. His studies have significantly expanded our understanding of how pathogens evolve their gene products to generate metabolic diversity.*

Chemical Sciences

Dr Srinivasan Sampath, Indian Institute of Science, Bangalore: *Dr Sampath has made outstanding contributions in developing supercapacitors and nanobimetallics and their novel applications.*

Dr K George Thomas, Regional Research Laboratory, Thiruvananthapuram: *Dr Thomas has made significant contributions to photoresponsive nanomaterials and their applications.*

Earth, Atmosphere, Ocean & Planetary Sciences

Dr Gufran-ullah Beig, Indian Institute of Tropical Meteorology,



The Shanti Swarup Bhatnagar Prize-winners with Prime Minister Dr Manmohan Singh, Minister of Science & Technology and Earth Sciences Shri Kapil Sibal and CSIR Director General Dr R.A. Mashelkar



Pune: Dr Beig has made significant contributions related to middle and upper atmospheric response to anthropogenic emissions of green house gases. His prediction of mesospheric cooling by 2 to 4k/decade has serious future implications.

Dr Pulak Sengupta, Jadavpur University, Kolkata: Dr Sengupta has made fundamental contributions to an understanding of grain-scale reaction mechanism and its application to ultra-high temperature regional scale metamorphism.

Engineering Sciences

Dr Ashish Kishore Lele, National Chemical Laboratory, Pune: Dr Lele has made pioneering contributions by probing micro and mesostructure of polymeric materials and relating it to the macroscopic dynamical and equilibrium properties using a combination of theory and experiments.

Dr Sanjay Mittal, Indian Institute of Technology, Kanpur: Dr Mittal has made fundamental contributions to the understanding of flow instabilities in the presence of fluid-structure interactions, specially when structure is flexible and interactions are highly dynamic and unsteady.

Mathematical Sciences

Dr Vikraman Balaji, Chennai Mathematical Institute, Siruseri: Dr Balaji has made significant contributions to moduli problems of principal bundles over algebraic

varieties, in particular on the Uhlenbeck-Yau compactification of the Moduli Spaces of μ -semistable bundles. Further his work on holonomy groups for stable bundles on surfaces is significant.

Dr Indranil Biswas, Tata Institute of Fundamental Research, Mumbai: Dr Biswas is a very productive mathematician who has contributed significantly to algebraic geometry, centering around moduli problems of vector bundles. He is also an acknowledged expert on moduli of parabolic bundles.

Medical Sciences

Dr Virender Singh Sangwan, L V Prasad Eye Institute, Hyderabad: Dr Sangwan has made outstanding contribution to the application of limbal stem cell biology to restore vision to victims of corneal injury.

Physical Sciences

Dr Atish Dabholkar, Tata Institute of Fundamental Research, Mumbai: Dr Dabholkar has established how quantum theory modifies the entropy of black holes and made pioneering studies on supersymmetric solitons in string theory.

Dr Sanjay Puri, Jawaharlal Nehru University, New Delhi: Dr Puri has made outstanding contribution to understanding problems in nonequilibrium statistical physics, such as kinetics of phase ordering, including the effects of confined geometries, as well as the role of defects in phase separation dynamics.

CSIR Diamond Jubilee Technology Award for 2006 awarded to Tejas Networks India Limited, Bangalore

The CSIR Diamond Jubilee Technology Award, given annually, was instituted in commemoration of CSIR Diamond Jubilee in 2003. It is given for technological development in the country by Indian innovators and which meets the highest global standards. The award carries a cash prize of Rs ten lakh, a shield and a citation.

The CSIR Diamond Jubilee Technology Award for 2006 was awarded to Tejas Networks India Limited, a Bangalore-based next-generation company, by Prime Minister Dr Manmohan Singh at the CSIR Foundation Day function at Vigyan Bhawan, New Delhi.

Citation

"Tejas Networks India Limited", an innovation-driven company has been conferred with the CSIR Diamond Jubilee Technology Award 2006 for Development of Next Generation Optical (SDH/SONET) Networking products and its successful commercialization from India.

Tejas products are differentiated by their embedded software intelligence, which



Prime Minister Dr Manmohan Singh presenting the CSIR Diamond Jubilee Technology Award for 2006 to Tejas Networks India Limited, Bangalore

enables advanced features such as auto-discovery of network topology, automated end-to-end provisioning through an easy-to-use, web-based Network Management System (NMS) that simplify operation and management of optical networks.

The cost-effective modular but scalable products are targeted at an entire range of networks starting from small and medium customers to large carrier-class networks to cover the complete gamut of carrier-access requirements. The technological edge that Tejas has acquired is reflected in the immense customer acceptance that it has achieved. Besides being the leading equipment supplier to Indian telecommunication carriers and service providers, Tejas has also made its presence felt in global markets by deploying tens of thousands of Tejas equipment across the globe in various customer networks in over 50 countries.

Continuing with its leadership position in this technology, Tejas is now well poised to leverage its R&D

have a significant footprint across the global telecom industry.”

Shri Sanjay Naik, CEO of Tejas Networks India Limited sincerely thanked CSIR in his brief Acceptance speech and said that the Tejas team was honoured. He

expressed thanks that such a young company was chosen for this prestigious award. He told the audience that six years ago, Tejas was set up in Bangalore with a vision to start a major telecom company. It has been a tremendously exciting journey and that global equipment companies are choosing Tejas as a partner. He emphasized that this was a situation where India was developing a product that global MNCs were taking up instead of the other way around and that this gives encouragement to go on.



Shri Sanjay Naik, CEO of Tejas Networks India Limited delivering the acceptance speech

proceed to deliver breakthrough products in the field of “Packetized Optical Transport.” These products are designed to combine the features of Next-Generation of SDH/SONET with MPLS in a seamless way, enabling Tejas Networks to

Central Leather Research Institute, Chennai gets the First CSIR Award for S&T Innovations for Rural Development

The CSIR Award for S&T Innovations for Rural Development has been instituted from this year (2006) to recognize those S&T innovations that have helped transform the lives of rural people or alleviated the drudgery of the rural people or have helped in generation of employment. Only successful S&T innovations that have been implemented at ground level are considered for the award. The award carries a cash prize of Rs 10 lakh, a shield and a citation.

Prime Minister Dr Manmohan Singh gave away the CSIR Award for S&T Innovations for Rural Development at the elegant function at Vigyan Bhawan, New Delhi, to the Central Leather Research Institute (CLRI), Chennai.

Citation

The CSIR Award for S&T Innovations for Rural Development has been given to CLRI in recognition of its contributions to designing, developing and delivering



effectively several critical technologies impacting positively the livelihood of a large number of people engaged in the Indian leather sector.

CLRI has made several S&T innovations, which are suited to village micro-enterprise sector. A basket of critical technologies of socio-economic relevance to nearly 1.4 million people engaged directly in rural leather sector has been designed, developed and delivered effectively. These technologies include innovative methods for recovery and fuller utilization of carcasses of fallen animals in villages, improved vegetable tanning and standardized production of open type ethnic footwear (Kohlapuri). The main connecting feature of S&T innovations of CLRI is in rendering the relatively small economies of scale associated with low investment capacities of village micro-enterprises.

The design intervention in Athani region for quality production of ethnic footwear has made a difference to the rural economy of the region. The technology packages developed and delivered by CLRI in a large number of locations in the country are in practice and serve as models for replication of these S&T innovations for rural development. The missionary zeal of CLRI in delivering the technology packages is unique.

Announcing the Award, Dr R.A. Mashelkar, remembered the contributions of Dr T. Ramasami, former Director, CLRI and currently, Secretary, Department of Science and Technology, Government of India, who could not attend the Award function.

Dr A.B. Mandal, Acting Director, CLRI and Dr S. Naidu received the award on behalf of Team-CLRI. In his acceptance speech, Dr Mandal said that CLRI was honoured to receive the first CSIR Award for S&T Innovations for Rural Development. His reminiscences took the audience back in time to the early days of CLRI when Sir C.V. Raman had paid a visit. Sir Raman had asked about the kind of research CLRI could do and the erstwhile Director of CLRI was quick to point out that the shoes of the distinguished visitor were made of leather — the result of high science. Dr Mandal concluded by saying, “We re-dedicate ourselves

to carry forward the mandate. The success of CLRI is the success of CSIR and thus, the country.”



Dr A.B. Mandal, Acting Director, CLRI, giving the acceptance speech



Prime Minister Dr Manmohan Singh presenting the CSIR Award for S&T Innovations for Rural Development to Central Leather Research Institute (CLRI), Chennai.



Group photo of the representatives of 'Team Tejas' and 'Team CLRI' with Dr Manmohan Singh, Shri Kapil Sibal and Dr R.A. Mashelkar



CSIR Foundation Day Celebrations

CSIR Foundation Day Function at Hotel Le Meridien, New Delhi



Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, presents CSIR Young Scientist Awards and CSIR Technology Awards for 2006 and releases 'Geno Cluster' and Compendium on Antarctica

The CSIR Foundation Day celebrations at Hotel Le Meridien, New Delhi, included the presentation of the CSIR Young Scientist Awards and CSIR Technology Awards for the year 2006, the launch of 'Geno Cluster' — a bioinformatics software developed jointly by the Institute of Genomics and Integrative Biology and Jalaja Technologies under the New Millennium Indian Technology Leadership Initiative (NMITLI) programme and release of a Compendium entitled "*Contributions of CSIR to Antarctic Research: Collected Reprints. Science Safari*, a film highlighting the innovative and path breaking achievements in Science and Technology in India — an initiative by Ministry of Science & Technology and Earth Sciences and the National Geographic channel was aired for the first time.

Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences and Vice President, CSIR, graced the occasion with his august presence and gave away the awards, launched the Geno Cluster and



CSIR Foundation Day Function at Hotel Le Meridien, New Delhi. Seated on the dais (from right) Dr R.A. Mashelkar, Director General, CSIR; Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, and Dr Vikram Kumar, Director, National Physical Laboratory, New Delhi

released the compendium on Antarctica. A memento was presented to Shri Sibal by Dr R.A. Mashelkar, Director General, CSIR.

Shri Kapil Sibal's Speech

Casting away his prepared speech, Shri Sibal chose to speak from his heart in an address that touched the audience deeply with its eloquence. He congratulated all the awardees and reiterated that he would remain a part of the CSIR

family and the S&T fraternity always.

He quoted Alan Lightman at the beginning of his speech and that set the mood for the rest of the evening. "All of the scientists I've known have at least one more quality in common: they do what they do because they love it, and because they cannot imagine doing anything else. In a sense, this is the real reason a scientist does science. Because the scientist must. Such a compulsion is both blessing and burden. A blessing because the



creative life, in any endeavor, is a gift filled with beauty and not given to everyone, a burden because the call is unrelenting and can drown out the rest of life."

Excerpts from the speech

"...it is this unrelenting call that made Dr R.A. Mashelkar and all the scientists here, what they are. It is all about romance & about the dream that all is possible. The boy began a career not knowing where it would take him. He joined NCL. He took up leadership of CSIR for eleven long years and now finds it difficult to say goodbye. That touches me. He cannot think of life without that romance — that achievement. This has also been my experience with the scientific community."

"Not intellect, but character defines a scientist and there is an abundance of character in this hall today."

"The PM was right (while talking about Dr Mashelkar earlier at Vigyan Bhawan) that the best is yet to come. But when you talk of retirement and correlate it with age, it is just a number, a cipher. Can you retire your experience? You have to use it. It is this experience that will allow you to achieve much more with much less energy. In employment you can take a day off but not in retirement."

"I am reminded of a saying by Sir Winston Churchill. He said, "We make a living by what we get, we make a life by what we give." Thank you for giving me the opportunity to have come to know you."

"I know the heart of a scientist, the passion within and recognize it.

"The flight from mind to market is an exciting flight and I have observed this. The scientists do not need the skies, it is not the galaxies they want"

"The sense of frustration in a cold-blooded, unrelentingly autocratic heartless system and I understand this. The lack of finance, slow movement of files, bureaucracy...but we have to work within the system."

"I have worked hard to change the system, to together lay the foundation of a new India, a new vision of what we want out of life and give to our people & daresay in the future it will be achieved."

"Science is all about people. It is a journey of discovery—not experiments. The more we discover, the more we learn that we do not know."

Shri Kapil Sibal congratulated the winners of the CSIR Young Scientist Awards and CSIR Technology Awards for the year 2006.

Launching the Geno-Cluster, a bioinformatics software developed jointly by the Institute of Genomics and Integrative Biology and Jalaja Technologies under NMITLI, Shri Sibal pointed out that NMITLI is the largest public-private-partnership R&D initiative of the Government of India. In a short span of time, the programme has several significant achievements to its credit. These include the TB molecule, herbal formulations for Psoriasis, low cost computer, weather forecast system, Bio-

informatics products, etc, with Geno-Cluster being one of them.

Releasing the compendium: *Contributions of CSIR to Antarctic Research: Collected Reprints*, the Minister said that the publication consists of published papers from national and international SCI journals pertaining to scientific work carried out by CSIR scientists and thus provides a comprehensive view of the work carried out by CSIR scientists during the last 25 years in Antarctic research.

This publication is an important contribution for CSIR — an organization that has participated in all 25 expeditions without a break and, which has been in the forefront, contributing significantly to Antarctic research.

Shri Kapil Sibal spoke glowingly about his experiences on the icy continent: "I have visited Antarctica and am delighted with the book released today"..... "In Antarctica, I discovered the enormity of nature...and discovered the irrelevance of the human being. As they say, life is a stage and we play a little role...some with flying colours and some not."

With reference to the screening of *Science Safari*, Shri Kapil Sibal drew the audience's attention to the theme, "Think Beyond." "That," he said, "is what we have been trying to do at the Ministry of S&T. This would be a tribute to the man — a great son of India, Dr Mashelkar." He invited the audience to give a standing ovation to Dr Mashelkar and there was thunderous applause from the audience that got up to its feet to cheer the Director General.



Welcome address by Dr R. A. Mashelkar, Director General, CSIR

Earlier, Dr R.A. Mashelkar, Director General CSIR, delivered the Welcome Address.

Dr Mashelkar began by welcoming Shri Kapil Sibal "...our adored, respected, beloved, Minister...guru, guide and friend to CSIR and the entire S&T fraternity", and then expressed his happiness at the fact that on the day of CSIR's Foundation, "...CSIR itself has figured in a big way at the National Awards given away earlier this day at Vigyan Bhawan. At the SSB Prize award ceremony there were three scientists from CSIR who got this award. They are Dr Vinod Bhakuni of Central Drug Research Institute, Lucknow, Dr K. George Thomas of RRL, Thiruvananthapuram and Dr Ashish Lele of National Chemical Laboratory, Pune." He pointed out that, "CSIR is not meant to do only science, but also use this science for the good of the nation." He spoke about the CSIR Award for S&T Innovations for Rural Development, which has been instituted from this year (2006) to recognize those S&T innovations that have helped transform the lives of rural people or alleviated the drudgery of the rural people or have helped in

generation of employment. He said that he was proud that the committee actually selected a CSIR laboratory for the award. "I am proud that on one hand we are doing the best in science and on the other hand we are contributing to society. CSIR technology is making a difference in the lives of people—many of them poor people."

Dr Mashelkar spoke about the emerging concept of the "Triple bottom line," which in practical terms, means expanding the traditional corporate culture to take into account the environmental and societal performances in addition to financial performance. This he said was what CSIR's work was all about and then he elaborated on the "essence of CSIR."

He reiterated the PM's statement earlier this morning at Vigyan Bhawan about the need to "promote, technology-led accelerated inclusive growth" and stressed the need to "include those who are excluded. This is precisely what CSIR is, and should be, doing."

On a more sombre note he pointed out, "This would be the last year that I am attending the Foundation Day as DG, CSIR. I am laying down office on 31 December this year." He then recalled the days of 1995 when he had just assumed office and took what he said was, "a snapshot of what we were then and what we are now." "There is cause to be happy...CSIR has evolved in many ways...and the current year

has been the best year for CSIR in terms of both science and business. He emphasized that the public and the media's perception of CSIR had gone up. Entire chapters are being devoted to CSIR's turn around in Management books and people of the stature of the World Bank President want CSIR's story to be told to leaders such as President Putin. He then struck a note of caution. "Of course, there are great expectations too. We have to move from third to fourth gear and if there is a fifth gear, we have to discover it."

On a personal note he thanked everyone, "...for the trust and confidence the people of this country reposed in a young boy who went barefoot till the age of twelve and who studied under streetlights...I am beholden to this country. I have done my very best and hope that it is good enough. But as the Prime Minister has said. "The best is yet to come," I shall continue to serve till end. I thank you all for this wonderful opportunity."

Dr Vikram Kumar, Director, National Physical Laboratory, New Delhi, delivered the Vote of Thanks following which *Science Safari* was screened.



Vote of thanks by
Dr Vikram Kumar,
Director, National
Physical Laboratory,
New Delhi



CSIR YOUNG SCIENTIST AWARDS

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

CSIR Young Scientist Award-winners for 2006

Biological Sciences

Dr Mohammad Sohail Akhtar, Central Drug Research Institute, Lucknow, for providing intriguing insights into the role of structural domains of *Streptococcus hyaluronate lyase* and of ionic interactions in modulating the functional activity and stability of this enzyme.

Chemical Sciences

Dr Rajkumar Banerjee, Indian Institute of Chemical Technology, Hyderabad, for his significant contributions to targeted cancer theory using molecular level approach.

Dr Srinivas Hotha, National Chemical Laboratory, Pune, for his important contributions to development of novel diversity oriented pathways for synthesis of chiral, oxygen-rich chemical libraries for applications as chemical genetic probes.

Earth, Atmosphere, Ocean, and Planetary Sciences

Dr Sandip Kumar Mukhopadhyay, Central Salt & Marine Chemicals Research

Institute, Bhavnagar, for his significant contributions to our understanding of estuarine biogeochemical processes and to the emission of greenhouse gas emissions from coastal wetlands.

Dr Prakash Kumar, National Geophysical Research Institute, Hyderabad, for his contributions to the understanding of lithosphere-aesthenosphere boundary which will have impact as the model for regional plate tectonics for Indian plate.

Engineering Sciences

Dr P. Thanikaivelan, Central Leather Research Institute, Chennai, for being instrumental in the innovation of a new pollution free route to leather processing of great industrial significance.



CSIR Young Scientist Award -winners for 2006 with Minister of Science & Technology and Earth Sciences Shri Kapil Sibal and CSIR Director General Dr R.A. Mashelkar



CSIR TECHNOLOGY AWARDS

With a view to fostering and encouraging in-house multi-disciplinary in-house team efforts and external interaction for technology development, transfer, marketing and commercialization, CSIR in 1990, instituted two sets of Technology Awards, viz. Technology Shields, and Technology Prizes.

Technology Shield

One shield each of Process and Engineering Technology, is awarded for major multidisciplinary technological contributions that have a sustained and visible economic, industrial and societal impact. The award comprises a prestigious rolling shield, a citation, a plaque and a grant of upto Rs 30 lakh for a specific project to the awardees.

Technology Prizes

One prize each in the four technological areas of Biological, Chemical, Engineering and Materials Technology is awarded to individual(s) or a team from CSIR and to the contributors external to CSIR for a specific and outstanding technological achievement. Each Technology Prize comprises a cash award of Rs 200,000, a citation and a plaque.

A fifth prize for Business Development and Technology Marketing of value Rs 100,000 is awarded for making significant contributions to enhancing of

business for CSIR knowledgebase.

The Prizes are shared among the individuals or members of the team; a plaque and a citation is awarded to each member of the group(s).

During the period of last sixteen years, on an average only half of these have been awarded, signifying the rigour and true high standards that these awards maintained. Thus, these Awards, over the years have come to enjoy a very high reputation internally as well as externally.

Winners of the CSIR Technology Awards for 2006

No Technology Shield was awarded this year and among the CSIR Technology Prizes only that

for Chemical Technology and the Prize, for Business Development and Technology Marketing were presented:

CSIR Technology Prize for Chemical Technology

“Awarded to Team Indian Institute of Petroleum (IIP), Dehradun, comprising A.K. Chatterjee, U.C. Agarwal, R.C. Ghildiyal, V.K. Bhatia and N.N. Kulsrestha for developing comb type polymeric wax crystal modifier and dewaxing aid additives for production of LOBS.

The wax crystal modifier is a versatile tailored comb-type polymeric filter aid additive to enhance slurry filterability during dewaxing/deoiling operations and



Recipients of the CSIR Prizes for 2006 with Shri Kapil Sibal and Dr R.A. Mashelkar



very effective at small dosages for a wide range of feed stocks and offers many advantages over other commercial additives.

It prevents agglomeration/ amorphous lumping or gel formation during crystallization which may impede filtration and leads to higher unit throughput and lower consumption of solvent and other utilities. M/s DorfKetal, Mumbai is producing and marketing the additive.”

Prize for Business Development and Technology Marketing

“Awarded to Team Central Leather Research Institute, Chennai, for significantly enhancing the business and markets for its knowledgebase.

CLRI has emerged as customer sensitive and globally competitive research institute during last decade. It has introduced technology partnership models for business process and adopted income approach model for pricing to share knowledge, develop technology and strategic assets which has led to a sustainable cumulative aggregated growth of over 15-17% in its External Cash Flow over a prolonged period of ten years.”

Dr A SubbaRama Naidu received the award on behalf of Team CLRI.

Geno Cluster



Launching of Geno Cluster: ‘Team IGIB- Jalaja Technologies’ with Shri Kapil Sibal, Dr R.A. Mashelkar and Dr D.Y. Rao

At the CSIR Foundation Day function held in Le Meridien, Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, launched the Geno Cluster, a bioinformatics software developed jointly by the Institute of Genomics and Integrative Biology (IGIB) and Jalaja Technologies under the New Millennium Indian Technology Leadership Initiative (NMITLI) programme.

Geno Cluster is a suite of high-end software applications based on concepts, which are fundamental to comparative genomics. The tools primarily aim to predict genes, protein functionality and virulence factors and work in tandem to provide a platform conducive to cutting edge research in the *in-silico* design of novel drug molecules and vaccines. The highly sophisticated Artificial Neural Networks (ANNs) are employed to identify genes/non genes/virulent factors. The high accuracy of the results emphasizes the success of the machine learning and statistical biology concepts. The software package includes a number of stand-alone software tools namely,

Gene ‘D’cfer, Proteome calculator and Seapath as well as PL-HoSTFA developed by IGIB independently.

Launching the bioinformatics software, Shri Kapil Sibal pointed out that NMITLI is the largest public-private-partnership R&D initiative of the Government of India. In a short span of time, the programme has several significant achievements to its credit. These include the TB molecule, herbal formulations for *Psoriasis*, low cost computer, weather forecast system, Bioinformatics products etc, with Geno Cluster being one of them.

He further said that the NMITLI programme is poised to charter new territories. It would not only build on innovation driven technology niches for economic and industrial development of the country but also to explore and develop newer models for innovation development.

Shri Kapil Sibal, Dr R.A. Mashelkar, Dr Samir Brahmachari, Director, IGIB, Dr D. Yogeshwara Rao, Head, TNBD (CSIR), and representative of Jalaja Technologies shared the dais on this happy moment.



Compendium entitled *Contributions of CSIR to Antarctic Research: Collected Reprints*



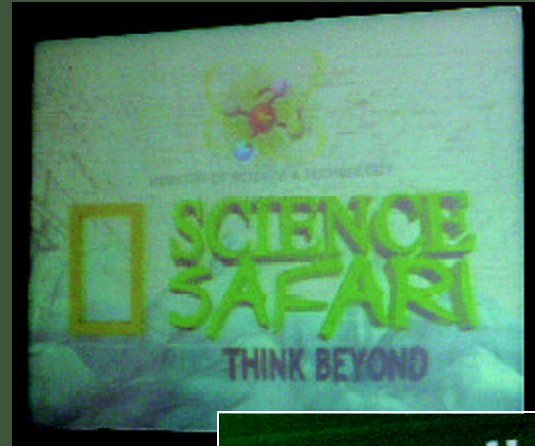
Release of the Compendium entitled: Contributions of CSIR to Antarctic Research: Collected Reprints

CSIR has been in the forefront in Antarctic Research. In fact, it has participated in all the 25 Indian expeditions, without interruption, and contributed a great deal both in terms of scientific papers as well as creating appropriate infrastructure for carrying out research.

Shri Kapil Sibal, Minister of Science & Technology and Earth Sciences, released a compendium entitled: *Contributions of CSIR to Antarctic Research: Collected Reprints* at the CSIR Foundation Day function held in Le Meridien, New Delhi. The compendium consists of papers pertaining to scientific work carried out by CSIR scientists in Antarctic research and published in national and international SCI journals, and thus provides a comprehensive view of the contribution of CSIR scientists in the area during the last 25 years.

Releasing the publication, Shri Kapil Sibal observed that this publication is an important contribution for CSIR—an organization that has participated in all 25 expeditions without a break and, which has been in the forefront, contributing significantly to Antarctic research. He spoke glowingly about his own experiences on the icy continent. “I have visited Antarctica and am delighted with the book released today.” “In Antarctica, I discovered the enormity of nature...and discovered the irrelevance of the human being. As they say, life is a stage and we play a little role...some with flying colours and some not.”

Science Safari — A film



Science Safari, a film highlighting the innovative and path breaking achievements in Science and Technology in India – an initiative by Ministry of Science & Technology and Earth Sciences and the National Geographic channel was aired for the first time.



Prior to screening of the film, Shri Kapil Sibal in his address drew the audience’s attention to its theme, “Think Beyond.” “That,” he said, “is what we have been trying to do at the Ministry of Science & Technology. This would be a tribute to the man — a great son of India, Dr Mashelkar.” He invited the audience to give a standing ovation to Dr Mashelkar and there was thunderous applause from the audience that got up to its feet to cheer the Director General.



CSIR Foundation Function at CSIR Headquarters, New Delhi



Dr R.A. Mashelkar presents CSIR Diamond Jubilee Invention Awards for School Children

At a function held at CSIR Headquarters in the afternoon, Dr R.A. Mashelkar, Director General, CSIR presented 'CSIR Diamond Jubilee Invention Awards for School Children' for 2006. The function was attended by Shri Nikhilesh Jha, Joint Secretary; Dr Naresh Kumar, Head, RPBD; Shri R.K. Gupta, IPMD; Shri Y.K. Sharma, Deputy Secretary, and a large number of scientists and officers of CSIR and school students.

The CSIR Diamond Jubilee Awards for Invention of School Students were instituted on the World Intellectual Property Day (26 April, 2002), with a view to encouraging the school students to innovate, and generating greater IPR awareness among them. The competition is open to bonafide school students, below eighteen years of age. Sixty prizes can be given; the



Dr R.A. Mashelkar addressing the award ceremony for 'CSIR Diamond Jubilee Invention Awards for School Children' at CSIR Headquarters. Seen on the dais from right are: Shri Nikhilesh Jha, Joint Secretary; Dr Naresh Kumar, Head, RPBD; and Shri Y.K. Sharma, Deputy Secretary, CSIR

first prize carries Rs 50,000. CSIR not only gives these awards but also helps in filing patents for the inventions that are patent worthy.



View of audience at Le Meridien



Winners of CSIR Diamond Jubilee Invention Awards for School Children for 2006

For the year 2006, after rigorous scrutiny of the entries received, only six could qualify for these awards — two for the third prize, one for the fourth and three for the fifth prize. None was found suitable for the first prize (Rs 50,000) or the second prize (Rs 25,000).

The winners are:

THIRD PRIZE

(No. of Prizes – Two of Rs 15,000/- each)

G. Karthik, of the Bala Vidya Mandir, Senior Secondary School, Gandhi Nagar, Adyar, Chennai, Tamilnadu, *for developing a new compound using ionic liquid and heteropolyacid*

Shikhar Bhandari of the B.V.B. Mehta Vidyalaya, K.G. Marg, New

Delhi, *for developing a Cycle Boat*

FOURTH PRIZE

(No. of Prizes – One of Rs. 10,000/-)

Sayali Arun Kulkarni of the Fergusson Junior College, Pune, *for developing a Water absorbent formulation of bio-degradable organic material and a moulding machine therefor*

FIFTH PRIZE

(No. of Prizes – Three of Rs. 5,000/- each)

Varun Mittal of the S.D. Public School, B.U. Block, Pitampura, New Delhi *for developing a method of preparation of chinaberry (Melia azedarach) fruit extract oil useful for feeding, growth and fecundity of diamond black moth (DBM) Plutella xylostella*

Neha Lalit Sharma of the FR

Agnel Multipurpose School, Sector 9A, Vashi, Navi Mumbai, *for developing a novel dermal applicator for animals, useful for dispensing liquid formulation*

Himanshu Gaur of the Kendriya Vidyalaya, O.L.F, Raipur, Dehra Dun, Uttaranchal, *for developing a multipurpose angle detector.*



Winners of the 'CSIR Diamond Jubilee Invention Awards for School Children' with Dr R.A. Mashelkar and Shri R.K. Gupta, Head, IPMD, CSIR



View of audience at the function at CSIR Headquarter