

# CSIR NEWS



Team CSIR



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## *Prime Minister of India Dr Manmohan Singh presents CSIR Diamond Jubilee Technology Award and Shanti Swarup Bhatnagar Prizes for 2003*

**Prime Minister of India Dr Manmohan Singh**, who is also President of the Council of Scientific & Industrial Research, gave away the CSIR Diamond Jubilee Technology Award-2003 and the Shanti Swarup Bhatnagar Prizes-2003 at a glittering function held at Vigyan Bhawan on 13 September 2004. Shri Kapil Sibal, Minister of State for Science & Technology, and Ocean Development and Vice President, CSIR, presided over the function, which was attended by a galaxy of eminent scientists, technocrats and media personnel. Also present was the Finance Minister Shri P. Chidambaram.

Dr R. A. Mashelkar, FRS, Director General, CSIR, extended a warm welcome and Prof. Samir K. Brahmachari, Director, IGIB, proposed a vote of thanks. A special feature was the brief narration of the success story of *Indica* and *Indigo* by Shri Ratan Tata, Chairman, TATA Motors Limited -- the winner of the first CSIR Diamond Jubilee Technology Award.

Also, the 'Bhatnagar Laureates (2003) Symposium' was held at National Physical Laboratory, New Delhi, on that day, where the Bhatnagar Prize-winners for 2003 highlighted their work.

Covered in this issue are the Award Presentation Function at Vigyan Bhawan and the Bhatnagar Laureates Symposium' at NPL.



"Our Government is fully committed to give Science and Technology a place of pride in all our national endeavours."

"Science must grapple with the key challenges facing the country today. These include the pressures of increasing population, greater health risks, changing demographics, degraded natural resources, and dwindling farmlands. We need new Science and Technologies, new priorities and new paradigms to address these fundamental challenges."

— Prime Minister Dr Manmohan Singh  
CSIR Diamond Jubilee Technology Award and  
Shanti Swarup Bhatnagar Prizes Presentation Function,  
Vigyan Bhawan, New Delhi, 13 September 2004

### Address by Prime Minister Dr Manmohan Singh at the CSIR Diamond Jubilee Technology Award & S.S. Bhatnagar Prizes Presentation Function

I am happy to be amongst you at a function to honour some of the most creative and dedicated people in the field of science and technology.

Let me begin by congratulating the winners of the Shanti Swarup Bhatnagar Prize for 2003. I am confident that the recognition implicit in receiving the nation's most prestigious prize in the field of science will inspire the awardees to still greater achievements in future. Many distinguished winners of this award have gone on to achieve new laurels. Therefore, I have full confidence that today's winners will realise the great responsibility placed upon them to continue to climb on the limitless ladder of excellence and creativity.

I am also happy to congratulate Mr Ratan Tata and his entire team, who have won the CSIR's first Diamond Jubilee Technology Award. The design, development, fabrication and launch of *Indica* was a major milestone in Indian auto industry. It is a matter of great pride for all of us today that an Indian *Indica* is being sold in the British market as City Rover! Tata's *Indica* achievement is

a tribute to Indian creativity, enterprise and team spirit, as well as to the dynamism of the Tata Group, led by Mr Ratan Tata.

Our technological prowess on the ground, as it were, is now being matched in the air: the inaugural flight of an indigenously designed and built civilian aircraft, *SARAS*, took place only last month. This is a great moment for our domestic civil aircraft industry. I am sure and hope that house of Tata will be in the forefront of national efforts to put us on the map of civil aviation industry as well. To me, *SARAS* is not an aircraft, just as *Indica* is not a car. Both stand for India's determination to win in the global technology race. It is this spirit that must propel us forward.

As I look around us, I am concerned that ours is a country of sharp contrasts and contradictions. On the one hand, we take satisfaction from the fact that over 100 global companies have come to India to set up R&D Centres, affirming the intellectual capital of our scientific and engineering community. But at the same time, it is saddening to note that science is no longer an automatic choice for our best and brightest students. Even amongst those who do



Dr Manmohan Singh delivering his address at the CDJT Award and Bhatnagar Prize presentation function

opt for the science stream at the University level, many do not pursue a career in science. We must redouble our efforts to make science an attractive career for our young people.

There are other contrasts. I find that whereas we pride ourselves in launching the most advanced satellites, thousands of our villages continue to lack drinking water. While we



see ourselves as an IT superpower, 200 million of our people remain illiterate. The great challenge facing us is to make high technology work for the poor. For this, we need concerted efforts combining the creativity and energy of all sections of our society.

Indian science and technology must make a greater difference to the lives of our people. This requires not just more Government investment in science and technology, though it is a must, but also more private investment in R&D and innovation. The visible changes in a variety of sectors, from pharmaceuticals and biotechnology to the automotive industry, are of course very refreshing. They are indications of shape of things to come. These efforts should be multiplied manifold.

Last week, I was informed of a breakthrough discovery, of a new molecule to treat a dreadful disease like Tuberculosis (see box on p260). I am told this is the first new molecule to appear since 1963. This achievement is entirely due to a unique public-private partnership between manufacturing firms and public institutions, through CSIR's New Millennium Technology Initiatives. Since tuberculosis takes a toll of 5 lakh lives each year in our country, this discovery could be of immense social and economic significance. We need more partnerships that create leadership for industry while helping the nation combat problems of the common man, such as diseases.

I assure you that in so far our government has a role, our Government is fully committed to give science and technology a place of pride in all our national endeavours. I wish to take this opportunity to share with you a few specific thoughts and our Government's ideas on contemporary science, technology, medicine and agriculture in India.

Let me recall what Louis Pasteur said in 1871. He said, 'There does not exist a category of science to which one can give the name applied science. There are science and the applications of science, bound together as the fruit of the tree which bears it'. This has historically been characteristic of our approach in India, as exemplified by the work of J.C. Bose, Satyen Bose, P.C. Ray, C.V. Raman, Birbal Sahni, P. Maheshwari, S. Ramanujam, P.C. Mahalanobis, C.R. Rao, G.N. Ramachandran or S.S. Bhatnagar, in whose names the prizes awarded today have been instituted. These men of learning have carried forward, in an unbroken chain, the true intellectual heritage of our country – the quest for knowledge. In my view, where there is good science, good applications follow. It is fundamental chemistry that gave us catalysts, polymers, semiconductors and nanomaterials. It is good biology that gave us the green revolution and the hepatitis vaccines. Therefore, I wish to set at rest today the debate about what our priority should be – basic or applied science. I think the answer is both. We need to have both basic and applied knowledge, and the ability to utilise them to the best advantage of our national effort. It will be our endeavour to promote good science, and useful applications will emerge from it.

I am told the Rand Corporation has classified 22 of 192 nations of the world as scientifically advanced, 24 as scientifically proficient, 40 as scientifically developing and the rest as deficient. India is ranked among the scientifically proficient nations. We must ask ourselves how we move from the 'scientifically proficient' category to the rank of scientifically advanced nations. Jawaharlal Nehru

said fifty-one years ago, 'The modern world is a world of science. Whatever the sphere of life we examine, we find we cannot live without science. That is why we have determined that our country should progress in science. We should produce high-class scientists. We require them in thousands. Only then our country will progress'. It is clear that Nehru's dream of 'scientists by the thousands' must be realised if we are to become a scientifically advanced nation. What will make India so? More funding and less restrictions. This is what our Government aims to do.

Science must grapple with the key challenges facing the country today. These include the pressures of increasing population, greater health risks, changing demographics, degraded natural resources, and dwindling farmlands. We need new science and technologies, new priorities and new paradigms to address these fundamental challenges. We in India are practising now physics and new chemistry to make new materials. These are of direct relevance to the Millennium Development Goals of the United Nations. We need to underline and emphasise our priorities in all these areas.

Ultimately, all research efforts require not just policy statements and encouragement, but funding. I am keenly aware that we must commit more resources to science and technology to emerge as a scientifically advanced nation by the year 2020. As Jawaharlal Nehru said in 1961, 'It is science alone that can solve the problems of hunger and poverty, insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inhabited by starving people. Who indeed could afford to ignore science today? At

## Sudoterb --A new anti - tuberculosis molecule discovered under NMITLI project

THE discovery of Sudoterb, a new anti-tuberculosis molecule which holds promise to bring down the treatment period from 6-12 months to just two months, is a landmark Indian breakthrough in the fight against tuberculosis (TB). Though the efforts to find a new molecule for more effective management of tuberculosis have been going on globally, the development of Sudoterb is the first success in this direction since the discovery of Rifampicin--the last anti-TB drug in 1963. Announcing the discovery of the new molecule on 6 September 2004, Shri Kapil Sibal the Minister of State for Science & Technology and Ocean Development said, "It is a day of pride for all of us. We will be recognized as world leader in pharmaceutical and drug development henceforth".

The discovery of Sudoterb is the outcome of the public-private partnership (PPP) for developing 'New Targets, Drug Delivery Systems, Bio-enhancers and Therapeutics for Latent *Mycobacterium tuberculosis*' under 'New Millennium Indian Technology Leadership Initiative' (NMITLI) being co-ordinated by the Council of Scientific & Industrial Research. The discovery, which is being hailed as a major breakthrough in the fight against a disease that continues to ravage one of the world's most populous nations - is testimony to the success of the project.

The NMITLI project on TB, which led to the discovery of Sudoterb has, in addition to Lupin Laboratories, the following four major partners: Central Drug Research Institute (CDRI), Lucknow; Indian Institute of Chemical Technology (IICT), Hyderabad; National Chemical Labo-

ratory (NCL), Pune; and University of Hyderabad. The team has secured patent protection in India and USA and applied to the Drug Controller General of India for permission to start clinical tests. The three phases of the clinical trials are likely to take around four years, after which the drug can hit the market.

During the pre-clinical studies Sudoterb has been found to be quite compatible with the present anti-TB drugs, viz. Isoniazid, Rifampicin, Pyrazinamide, Ethambutol and Streptomycin, and works very well by replacing one or two drugs from the present cocktail of four-drug therapy. The cocktail with Sudoterb is less toxic, clears the infection in two months and no recurrence has been observed.

The new drug is poised to make a tremendous impact globally. Worldwide, around two billion people, i.e., one-third of the world's total population, are infected by *M. tuberculosis*. Nearly eight million new cases are added, and around two million deaths are reported every year. The South-East Asia Region has the largest number of cases (almost 33% of the total), with India accounting for a substantial chunk. In

India, each year around two million people develop TB and around 0.45 million die due to it. TB kills more people than HIV; STD, malaria, leprosy and tropical diseases combined. It is a major barrier to the nation's economic development, costing Rs 12,000 crore annually.

The success in discovering a new anti-tuberculosis molecule is a sign that domestic research can compete at the highest global level. But it is clear that India needs to find more researchers. □



प्रधान मंत्री  
Prime Minister

New Delhi  
September 7, 2004

Dear Kapil,

Thank you for your letter of September 4, 2004 conveying the news of the discovery of a new anti-tuberculosis molecule under the aegis of CSIR and its partner in the private sector, Lupin Limited.

I congratulate all those associated with this public-private initiative, aimed at eliminating this major scourge from our country. I trust that the entire process of regulatory examination, trials and other essential elements of the process of introducing new medication are undertaken, with necessary attention to detail, at the earliest.

I wish you and all those associated with this effort every success.

With regards,

Yours sincerely,

Shri Kapil Sibal  
Minister of State (Independent Charge)  
for Science & Technology and Ocean Development  
New Delhi

every turn we have to seek its aid the future belongs to science and to those who make friends with science".

Yet due to the deteriorating health of our Universities in the past two decades, our scientific research base has not grown fast enough, commensurate with our need. While a few good scientific institutions have come up in recent years, they cannot be a substitute for the spread, vitality and vibrancy of the university system. Reconstruction of our university system must be a top priority and the issue has to be addressed comprehensively, not in a piecemeal fashion.

New strategies need to be developed to induct, nurture and retain young talent in the science stream. In particular, science and education at 10+2 and undergraduate levels need special attention. Approaches that harmonise the professional satisfaction of a creative endeavour with reasonable financial compensation must be put into shape. Every effort should be made to broad-base career opportunities in private and public R&D as well as in the university system. A provision for creating special positions and giving monetary incentives should be made, to retain high quality talent in S&T.

Many S&T initiatives in the past seem to have grown in isolation, due to limitations that prevent the university system from absorbing them. We need to have a fresh look at the linkages between our national laboratories and the university system. As far as possible, future S&T programmes and initiatives should seek to strengthen the base, that is, our university system. We must also modernise many of the instruments, which support research, to make them relevant to our present context. There is an urgent need to either

drastically restructure them or create now, responsive, independent and forward looking entities.

Issues related to sustainable development offer challenges in the form of 'new science and technology' for the 21st century. It provides a great opportunity for bringing synergy between various S&T disciplines and can be a forum for confluence of different knowledge streams. A holistic, research - driven approach to 'science for sustainable development' can be of great benefit in addressing issues of poverty, employment, energy and environment that are very relevant to our country.

Finally, there is an under-explored international dimension to S&T in our country. This pertains to engaging with the developing world. Developing countries seek to benefit from our experience in building a good base in R&D. There is a great opportunity for us to increase our presence, influence and future trade prospects in the developing world by strengthening S&T linkages through cooperation and networking. These can be achieved through a mix of governmental outreach and academic and non-governmental contacts. Special attention should be given to forging new collaborative programmes and research links, particularly with countries in Africa, Central Asia and our neighbourhood.

Let me conclude by making a few specific commitments for our government.

- I reaffirm India's commitment to basic science, applied science and the promotion of excellence.
- A commitment to rebuild the science base in the universities. This will include creating synergy between new initiatives in S&T and our university system.
- A commitment to promote public-private partnerships vigorously, to

increase funding for frontier areas of scientific research.

- A commitment to the assurance of autonomy, accountability and de-bureaucratisation of S&T institutions.
- A commitment to restructure our S&T support systems.
- A commitment to create career opportunities and the potential for retaining talent in the S&T sector.

Science and technology is an area of special concern for our Government. I want to renew the commitment that our great leaders like Jawaharlal Nehru and Indiraji made to the development of science and technology in India. We have had a rich tradition of building a modern world-class knowledge economy in an economically developing country. Perhaps in recent times we have not done enough. But I am convinced that our country's future and the prosperity of our people are vitally dependent upon the development of science and technology and the harnessing of the gains of S&T for development. Equally, we must renew our commitment to fostering a scientific temper among the people so that we are able to deal with the challenges at hand in a rational and reasonable manner. In this context, I propose to constitute a Science Advisory Council to the Prime Minister, to be headed by a very distinguished scientist. The SAC will advise us on strategies, policies and programmes for the development and utilisation of science and technology as an essential input for all our developmental processes.

With these words, let me conclude by wishing you well. I hope that with your commitment and scholarship, you will take our country to greater heights of excellence through creative endeavour." □

### Presidential Address by Shri Kapil Sibal, Minister of State for Science & Technology and Ocean Development

**H**ON'BLE Prime Minister of India Dr Manmohan Singh, Secretary Dr Ramesh Mashelkar Ji, Members of the Scientific Community, Representatives of the Media, Ladies & Gentlemen:

The Council of Scientific and Industrial Research believes in excellence and recognizes achievers of excellence in the field of science and technology. We gather here to applaud the innovators and entrepreneurs of today. We do this as a token of our appreciation for their invaluable contribution to societal causes in the context of our contemporary requirements. We are in the midst of a world where innovations in science and technology are changing the relationship not only between man and man but also between man and his environment. As I speak, somebody, somewhere in the world is innovating and the new technologies that will emerge will change our vision of the future.

Science & Technology is a most potent tool in the hands of those who yearn for solutions that confront humanity and cut across all disciplines. We applaud the achievers of today and march forward in search of the achievers of tomorrow.

At the outset I thank the Hon'ble Prime Minister for gracing this function. This gesture Sir, will signal to the scientific community your deep and abiding faith, commitment and support to use science and technology as an integral tool for all developmental activities.

I would like to take this opportunity to applaud the indomitable spirit

of entrepreneurship of the House of TATA's to take up the daunting venture to design, develop and commercialise a truly Indian car in the market place swarming with global industrial giants.

My felicitations to the Bhatnagar Prize

Awardees for their commendable achievements that bagged them the most prestigious of science awards in the country. Today you rank among the elite list of 'Who's Who' of Indian Science.

Today we honour the best of Indian Technology Initiative and Excellence in Science. It is such intermingling of high science with technological innovation and daring entrepreneurship that is necessary to propel India to a 'developed nation status'.

The marriage of high science and high technology in a sense symbolizes the underlying spirit of CSIR, that is to, strive for excellence in science and to apply it to uncharted technology domains.

About a month ago, I had the opportunity to witness the realization of the spirit of CSIR in the test flight of its 14-seater light transport aircraft



Shri Kapil Sibal delivering his address at the CDJT Award and Bhatnagar Prize presentation function

– SARAS. A 'flight into the future' for civil aviation in India. It was a thrilling and a proud moment for me to see an Indian plane soaring in the skies. Clearly, CSIR has soared out into the techno space of design and fabrication of small civilian aircraft.

It was JRD Tata who pioneered civil aviation in India. The year 2004 is a tri-centenary year for the house of TATA's. I feel the moment has come for the TATA's to take up the baton from CSIR and carve out for India a niche in civilian aircraft manufacture. Such synergistic public-private partnerships can bring to the people of India 'all the benefits that science and technology can bestow'.

It is not only in the economic domain that we are seeking such public-private partnerships. It is also for improving the quality of life of our people that we devise appropriate

means and mechanisms to forge, strengthen and advance public-private partnerships. We have made a beginning in the infrastructure sector; we shall do so in other areas as well. I would urge all of you to come

forward and contribute all your mite in this endeavour.

The awardees have done India proud with their singularly momentous achievements. They deserve our congratulations. They are the torchbearers of tomorrow. On the

strength of their achievements today, future innovators will take their dreams forward. They are the building blocks that make a strong nation. They are our strength and we salute them.

### Welcome Address by Dr R. A. Mashelkar, FRS Director General, CSIR

**E**ARLIER, while welcoming the distinguished gathering, Dr R. A. Mashelkar, FRS, Director General, CSIR, said; "This is a great evening—an evening of celebration of the very best that both the Indian Science and Technology have to offer. It is a very unique event because, till now, normally science and technology events used to be held separately. I believe it is the first occasion when the best of Indian Science and the best of Indian Technology will be applauded together.

Extending a hearty warm welcome to Prime Minister Dr Manmohan Singh, Dr Mashelkar said, "Your very presence here is most inspiring for all of us. Your deep commitment to Science and Technology was evident over the years, but it was most evident when you made repeated references to the critical role, the vital role that Science and Technology is going to play in building the new India of your dreams, when you addressed the nation from Red Fort on 15<sup>th</sup> of August. I assure you, on behalf of the entire scientific and technological community of India, that we will give every ounce of our energy to fulfil this dream."

Welcoming Shri Kapil Sibal, Dr Mashelkar said, "In a short period since you have assumed charge, you have charmed India and inspired the entire scientific and technological community with your energy, pas-

sion and vision. You have filled the scientific community with aspiration, a new sense of urgency and a new sense of purpose." "In a lighter vein, I can also say, you have been lucky for us! If one takes a look at the past 100 days of S&T in India and in particularly what CSIR and CSIR-associated projects have been able to achieve, one can see a number of high points", and you have spoken glowingly about these indigenously designed and built *Saras*' soaring flight into the future ("dawn of Civilian Aviation Industry in India though of course, we still have miles to go"); the breakthrough in psoriasis ("a very difficult disease") and tuberculosis ("the first new molecule on the horizon since 1963"); the unique partnership with Tata Consultancy Services and the Bioinformatics software *BioSuite* ("software first launched in San Francisco, then in Hyderabad); and efforts to combine traditional knowledge with modern science ("our dream to look at our traditional knowledge and combine it with modern science, that is coming to fruition)."

Regarding the Bhatnagar Prizes Dr Mashelkar said, "There is no question that the Shanti Swarup Bhatnagar Prize is the most prestigious that India has to offer." The



Dr R. A. Mashelkar, Director General, CSIR delivering his welcome address

Bhatnagar Prizes were instituted in 1958 and in 1959, Pandit Jawaharlal Nehru gave the first Bhatnagar Prize to Dr K. S. Krishnan—the great physicist. Since then it has been a long and glittering list of names. "One can get many awards and international honours in one's life time but as a scientist, it is, the most cherished award."

Regarding the CSIR Diamond Jubilee Technology Award, Dr Mashelkar said that this award was instituted by CSIR in commemoration of its Diamond Jubilee in 2003, to acknowledge the most outstanding

technological innovation that has brought prestige to the nation. The award consists of a cash prize of Rs ten lakh, a citation and a shield. It is given to a technology that has been developed in the country by Indian innovators and meets the highest global standards. Technologies leading to commercially successful products, processes and services, which give India a sustainable competitive advantage, are considered for the award. The idea is to celebrate and applaud the very best of Indian technology, for the CSIR Diamond Jubilee Technology Award - 2003, Dr Mashelkar informed.

The shield has been especially designed. A strong foundation in research is the basis for achieving excellence. The solid, stable base of the shield is a metaphor for this strong foundation. Building on the foundation are the Processes and

Products, which run the company and are responsible for its very existence. The two Ps are represented by the twin halves of the memento, in mirror finished gold and silver reflecting excellence.

The circle represents perfection. And the sphere, being an extension of the circle, symbolizes super-perfection. The toothed wheel on the face of the silver half is an accepted symbol for industry and industrial progress. The rotating disc at the centre of the toothed wheel represents the continuity of self-betterment and innovation, which alone leads to eventual excellence. The well-integrated form towers to an apex, its sail-like silhouette emphasizing the constant search to do better and reach higher. Gold and silver, being precious metals, are ideal symbols of the prestige that is associated with this award.

CSIR had received 116 nominations and that a very eminent board did the selection after a stringent selection procedure by adopting a two-tier rigorous evaluation and assessment process. He said, "We are very proud that the very first award is going to an Indian enterprise that is the most respected in the country. An enterprise that has demonstrated its determination, an enterprise that is well-known for having accumulated the highest standard of social and ethical standard in the country today." He announced, "We honour Tata Motors for showcasing India on the World Automobile Map."

He then read out the Citations of CSIR Diamond Jubilee Technology Award & Shanti Swarup Bhatnagar Prize-winners (p 265 & 266 respectively).

### Shri Ratan Tata, Chairman, Tata Motors, responds

**I**N his Acceptance Speech, Shri Ratan Tata, Chairman, Tata Motors Limited said, "It is an extremely great honour to receive this Award on behalf of Tata Motors." He said that he was, "Honoured to receive it on behalf of the 700 young engineers who accepted the challenge that many said couldn't be done." He said that the team persevered despite toothy troubles and frustrations and finally the *Indica* project was brought to fruition. As "an Indian who is proud of his country", he observed, "There are many, many such projects and many, many such achievements that are possible in the Science and Technology arena in India today. We have the manpower, we have the skill and the human capital, but we sometimes lack the belief that we can do it. We, as Indians need to

believe in our (own) capabilities. I would like to speak about the feeling that this country has a tremendous future but we, as Indians, need to believe in our country and in our people's capabilities more than what we give them credit for." He shared with the audience

his personal experiences during the days when Team Indica was still working on the project. Many people (foreigner friends) said they, "shouldn't do it as no one had done



Shri Ratan Tata, Chairman, Tata Motors, delivering his address

such a thing alone." Indian friends warned him that he shouldn't do it as he would "fail." At the prototype stage many friends distanced themselves for fear of failure. Shri Ratan

**CSIR Diamond Jubilee Technology Award 2003**  
**CITATION**



"The first CSIR Diamond Jubilee Technology Award for 2003 was conferred on Tata Motors for the successful indigenous design, development, manufacturing and commercialization of passenger cars, Indica and Indigo. Tata Motors took up the seemingly insurmountable challenge at a time when other Indian manufacturers thought it was not possible to compete with globally established players. They not only took up the challenge, but also successfully competed against them. Their cars have come to command customer preference and loyalty, and are building inroads in the highly competitive export market. It has catapulted India into the select league of a handful of nations who make and export their own cars. The success of Tata Motors has demonstrated the redoubtable technological and engineering capabilities of India and the competitive spirit of the nation."



Shri Ratan Tata and his team Indica with Dr Manmohan Singh, Shri Kapil Sibal, Dr R.A. Mashelkar and Prof. Samir K. Brahmachari



Shri Ratan Tata receiving the CSIR Diamond Jubilee Technology Award from Dr Manmohan Singh. Also seen (from left) are: Dr R.A. Mashelkar and Shri Kapil Sibal



September 16, 2004

Ratan Tata  
 Chairman

*Dear Dr. Mashelkar,*

All of us at Tata Motors have been extremely excited in having been recognized and to have received the CSIR Diamond Jubilee Technology Award from the Prime Minister on Monday.

Being with you at Vigyan Bhawan that evening brought back memories of the very enjoyable time in Bonn when we got to know each other a little better, and spent time there discussing technology – much to the annoyance of the other delegates!

I greatly admire what you have been able to do for India in the area of science and technology, and the tremendous change you have created at CSIR.

With warm personal regards,

Yours sincerely,

*Ratan*

Dr. R.A. Mashelkar  
 Director General  
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**TATA MOTORS LIMITED**

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Tata candidly admitted, "...and a time came when even I thought I had failed." Then he smilingly added, "Of course they came back again as teething troubles got over and were

closest friends again." "There is tremendous talent in young scientists and young engineers. We need to give them a chance to prove themselves. We need to recognise their

ability and achievements. This kind of recognition is a tremendous shot in the arm for such engineers and such scientists and given this kind of opportunity, I think this country can shine far, far more than it has done," he said.

*A movie on the Success Story of Indica Project was screened.*

Prof. Samir K. Brahmachari, Director, Institute of Genomics and Integrative Biology, Delhi, proposed a vote of thanks and expressed gratitude to all those who made the occasion a grand success. □



### Shanti Swarup Bhatnagar Prizes-2003

#### CITATIONS

#### Biological Sciences

##### Dr Satyajit Mayor

Dr Satyajit Mayor of the National Centre for Biological Sciences, Bangalore, has made outstanding contributions to the study of endocytosis in living cells. His work has greatly advanced the understanding of the endocytic pathway of lipid-anchored proteins. The concept of lipid rafts has emerged directly from Dr Mayor's work. His studies of endocytic processes have been based on the development of novel fluorescence methodologies, which permit visualization of specialized domains in cell membranes. Dr Mayor's work represents a significant advance in the understanding of membrane-associated trafficking events in cells.

#### Chemical Sciences

##### Dr Santanu Bhattacharya

Dr Santanu Bhattacharya of the Indian Institute of Science, Bangalore,

has made significant contributions in the domains of molecular design of lipids and membranes and synthesis of novel peptides for sequence-specific DNA recognition.

##### Dr Vadapalli Chandrasekhar

Dr Vadapalli Chandrasekhar of the Indian Institute of Technology, Kanpur, has made significant contributions to the chemistry of inorganic clusters and rings. His work has provided novel solutions to many synthetic and structural problems.

#### Earth, Atmosphere, Ocean and Planetary Sciences

##### Dr Guntupalli Veera Raghavendra Prasad

Dr Guntupalli Veera Raghavendra Prasad of the University of Jammu, Jammu, has made outstanding contributions on the origin, diversity, and biogeographic relationships of various Mesozoic (245 – 65 m.y.) vertebrate groups of India, with special reference

to Cretaceous mammals and the Late Cretaceous palaeobiogeographic reconstructions of the Indian plate.

##### Dr Kanchan Pande

Dr Kanchan Pande of the Physical Research Laboratory, Ahmedabad, (presently with the Indian Institute of Technology Bombay, Mumbai), has made outstanding contributions in providing geochronological constraints for the evolution of continental flood basalts in the Indian subcontinent, especially the Deccan, and their geological and geochemical implications.

#### Engineering Sciences

##### Dr Atul Harish Chokshi

Dr Atul Harish Chokshi of the Indian Institute of Science, Bangalore, has made significant contributions to the understanding of the role of interfaces in high temperature deformation and failure of ceramic materials.

## CSIR DJT Awards & S.S. B. Prize Presentation Function



Dr Manmohan Singh, Prime Minister of India, presenting the Shanti Swarup Bhatnagar Prizes for the year 2003, to (row-wise from top left):

Dr Satyajit Mayor, Dr Santanu Bhattacharya, Dr Vadapalli Chandrasekhar, Dr Guntupalli Veera Raghavendra Prasad, Dr Kanchan Pande, Dr Manindra Agrawal, Dr Chinmoy Sankar Dey, Dr Anil Kumar Mandal, Dr Gattamraju Ravindra Kumar, Dr Biswarup Mukhopadhyaya. Also seen in photographs is Shri Kapil Sibal, Minister of State for Science & Technology and Ocean Development

Three of the Prize-winners, Dr Atul Harish Chokshi, Dr Soumitro Banerjee and Dr Vasudevan Srinivas, had gone abroad and therefore could not attend the function

## Dr Soumitro Banerjee

Dr Soumitro Banerjee of the Indian Institute of Technology, Kharagpur, has done experimental observation of novel bifurcation phenomena in power electronic circuits and subsequent analysis thereof, which made a significant contribution to the theory of nonlinear dynamics, notably the theory of border collision bifurcations.

## Mathematical Sciences

### Dr Manindra Agrawal

Dr Manindra Agrawal of the Indian Institute of Technology, Kanpur, has made outstanding contributions to computational complexity. He has recently given a deterministic polynomial-time algorithm to determine if a number is prime. His work leading to the solution of this long-standing problem is stunning for its sheer simplicity.

### Dr Vasudevan Srinivas

Dr Vasudevan Srinivas of the Tata Institute of Fundamental Re-

search, Mumbai, has made outstanding contributions in the study of algebraic cycles on singular varieties, an area of which he is essentially the originator. He has also proved many significant results in other areas of algebraic geometry and commutative algebra.

## Medical Sciences

### Dr Chinmoy Sankar Dey

Dr Chinmoy Sankar Dey of the National Institute of Pharmaceutical Education and Research, Mohali, has made a seminal contribution by developing a novel *in vitro* model of insulin resistance. His discovery has potential in molecular target-based screening of new antidiabetic drugs.

### Dr Anil Kumar Mandal

Dr Anil Kumar Mandal of the L.V. Prasad Eye Institute, Hyderabad, has developed an alternative and innovative mode of surgical treatment for paediatric glaucoma and has contrib-

uted to a molecular genetic analysis of primary congenital glaucoma.

## Physical Sciences

### Dr Gattamraju Ravindra Kumar

Dr Gattamraju Ravindra Kumar of the Tata Institute of Fundamental Research, Mumbai, has conducted incisive experiments using ultrafast laser pulses generating megagauss magnetic pulses, enhanced generation of hard x-ray pulses from nanoparticle coated surfaces and demonstration of molecular pendular states.

### Dr Biswarup Mukhopadhyaya

Dr Biswarup Mukhopadhyaya of the Harish-Chandra Research Institute, Allahabad, has done pioneering work relating neutrino mass to supersymmetry and has demonstrated for the first time that gauge boson fusion could be the dominant mode of supersymmetric particle production. □



Bhatnagar Prize-winners with Dr Manmohan Singh, Shri Kapil Sibal, Dr R.A. Mashelkar and Prof. Samir K. Brahmachari

## Bhatnagar Laureates (2003) Symposium



Dr R. A. Mashelkar delivering his welcome address at the Bhatnagar Laureates (2003) Symposium. Seated on dais (from left) are: Dr S. R. Shetye, Prof. Sushanta Dattagupta, Prof. Biman Bagchi and Dr Vikram Kumar

**T**HE Bhatnagar Laureates (2003) Symposium was held on 13 September 2004 in the Auditorium of the National Physical Laboratory (NPL), New Delhi.

Welcoming the recipients of the Shanti Swarup Bhatnagar Prize, Dr Mashelkar described each one of them as *Koh-i-noor*. He shared with the audience his own emotional memories of the day in 1982 when he himself received this award. Though subsequently he had won many more awards, the memories of the day when he won the Shanti Swarup Bhatnagar Prize have remained, "the happiest and the proudest moment of my life."

He said that the Bhatnagar Prize is a special prize which has re-

mained untainted. It is awarded "entirely on the basis of merit." One gets it when one is young. He proudly announced, "that the choice is right is evident by the fact that the young people who have won it have later gone on to achieve great eminence as adjudged by national and international standards, without exception."

He said that a statistical survey had shown that majority of the Bhatnagar Prize-winners were in the country and working in the country, doing science. "Doing science is one thing, doing great science is another thing and doing great science outside (India) is yet another thing." Almost all of them, Dr Mashelkar, said, "are doing great science in India and that, takes

some doing! And that is what we find very special."

He explained that the idea of the Bhatnagar Laureates Symposium came up last year. The basic aim was "to expose young people to the best of Indian science."

He took the example of the ceremonial lamp that he had lit earlier to explain how knowledge too is like a lamp. "It takes a match to light the candle that lights the lamp," he pointed out. "Knowledge too is like a lamp and Excellence tend to rub off," he said. "The awards reiterate what excellence stands for, what raising the bar stands for... and this is what the symposium is all about."

He conceded that there were "deep worries about the state of Indian science", particularly when benchmarking, not just against USA or UK, but also against Brazil, Korea, China and Singapore.

There is concern about the quality of Indian science too, because in science, only those who have said either the first word or the last word are remembered. "We haven't done it often enough.

We haven't touched the peaks of excellence that would make India truly shine. Of course, there is plenty of debate and many alibis as to why we have not touched the 'peaks of excellence', but we must remember that it is not the size of the budget but the size of the idea that matters. The Bhatnagar Prizes are awards for reaching the peaks." "If you do not produce science that makes a difference to the pool of global science or that which doesn't touch Indian science...it is not worth doing. These are the twin challenges facing scientists," he said.

Dr Mashelkar pointed out that India is not deficient in raw material. Though India may have had a poor showing at the Olympic Games, "we win medals in the Olympics of the Mind." "All nineteen of the nineteen Indian contestants at the Science Olympiads, in which 55 countries contested, had come back with at least one prize. "This just shows," " that we need to give them the right track," he concluded.

Prof. Biman Bagchi of the Indian Institute of Science, Banga-

lore, was the Chairperson for the Chemical Sciences Section. Dr Santanu Bhattacharya, Indian Institute of Science, Bangalore, one of the two recipients of the Bhatnagar Prize in this section spoke on 'Molecular Design for Gene Delivery and Regulation.' Prof. V. Chandrasekhar of IIT, Kanpur, the co-recipient of the prize, spoke next. The title of his talk was 'Phosphonates and Stannoxanes: Building Bridges between Main Group and Transition Metal Chemistry.'

Dr S. R. Shetye, Director, National Institute of Oceanography, Dona Paula, Goa, chaired the Earth, Atmosphere, Ocean & Planetary Sciences Section. Prof. G. V. R. Prasad of the University of Jammu, Jammu, one of the two recipients of the Bhatnagar Prize in this section spoke on 'Biological Consequences of India's Northward Journey.' Prof. Kanchan Pande of IIT, Bombay, Mumbai, the co-recipient of the prize, spoke on 'Flood Basalts: The Imperfect Link Between Volcanoes and Mass Extinction.'

Prof. Sushanta Dattagupta of the S. N. Bose Centre of Basic Sciences, Kolkata chaired the Section covering both Mathematical Sciences and Physical Sciences.

Dr Manindra Agrawal of IIT, Kanpur, recipient of the Bhatnagar Prize in the Mathematical Sciences spoke on 'An Efficient Characterization of Prime Numbers.'

Dr G. Ravindra Kumar of the Tata Institute of Fundamental Re-

search, Mumbai and one of the two recipients of the Bhatnagar Prize in the Physical Sciences, spoke on 'Light at its Most Exciting (or A Look at What Intense Light Can Do). Prof. Biswarup Mukhopadhyaya of the Harish Chandra Research Institute, Allahabad and the co-recipient of the prize, spoke on 'New Physics in the World of Elementary Particles—the Ever Inwards Journey.'

Prof. Samir K. Brahmachari, Director IGIB, was the chairperson for the Section covering both Medical Sciences and Biological Sciences.

Prof. Chinmoy Sankar Dey of the National Institute of Pharmaceutical Education and Research, Mohali, and one of the two recipients of the Bhatnagar Prize in the Medical Sciences spoke on 'Development of Insulin Resistant Skeletal Muscle Cell Culture Model.' Dr Anil Kumar Mandal of the L. V. Prasad Eye Institute, Hyderabad, the co-recipient, spoke on 'The Developmental Glaucoma in India—your Children, Our Efforts, His Wishes.'

Dr Satyajit Mayor of National Centre for Biological Sciences, Bangalore and winner of the Bhatnagar Prize for Biological Sciences, spoke on 'Molecular Mechanisms of Endocytic Traffic—From (Cell) Biology to (Bio) Physics (and Back?).'

Each session was followed by lively interaction between the audience. □

## Visit of Ms Alison Brimelow, President Elect, European Patent Office, visits NISCAIR

**M**S Alison Brimelow, President Elect, European Patent Office visited the National Institute of Science Communication And Information Resources (NISCAIR), New Delhi on 19 August 2004 to get firsthand information on the Traditional Knowledge Digital Library (TKDL) project—a prestigious collaborative project between NISCAIR and the Department of Indian Systems of Medicine and Homoeopathy, Ministry of Health and Family Welfare. TKDL has national significance since identifying, registering and protecting intellectual property rights has emerged as one of the key drivers of business competitiveness in the 21<sup>st</sup> century. Ms Brimelow took keen interest in the TKDL project and interacted with the Ayurveda, Unani and IT Experts



Ms Alison Brimelow, President Elect, European Patent Office, with the NISCAIR Director Shri V.K. Gupta

working in the field of intellectual property rights. She appreciated the work done by the TKDL team and felt that TKDL would serve its objective by preventing the grant of wrong patents on traditional knowledge in international patent offices.

Shri V. K. Gupta, Director, NISCAIR gave a presentation covering

the salient features and the global relevance of TKDL project. An innovative classification system based on the structure of International Patent Classification (IPC), called the Traditional Knowledge Resource Classification (TKRC), was evolved for the creation of the Traditional Knowledge Digital Library. The TKDL database would provide an easily accessible and retrievable source for patent examiners to verify claims relating to traditional knowledge. Shri Gupta also explained the access policy of

TKDL and presented a sample CD containing about 36,000 formulations transcribed in patent application format and images from the original texts transcribed and incorporated into the database to Ms Brimelow, which she promised to hand over to the UK Patent Office. □

## Training Programme on Patent Classification, Search and Examination of Application at NISCAIR

**T**HE National Institute of Science Communication And Information Resources (NISCAIR), New Delhi, recently organized a training programme on patent classification, search and examination of application. Shri V.K.Gupta, Director, NISCAIR inaugurated the training programme. Twenty-three participants took part in the five-day programme.

In his welcome address, Shri Gupta informed that a new division called IPR&D division has been cre-

ated in the institute to carry out R&D activity in the area of intellectual property (IP). He stressed that the issue of Intellectual Property Rights (IPR) after WTO had become "extraordinarily relevant," and so there is a need for such programmes on Patents. This would allow the scientists to learn the intricacies of the subject and this in turn, would lead to core competence being developed at NISCAIR. He reiterated the need for scientists to be made "IP-Savvy," as IP issues impact the lives of every-

one. He informed that NISCAIR journals have IPC integral to the journal and so this programme would be useful to NISCAIR Scientists engaged in editing of scientific journals. It would help them to assign appropriate classification numbers to research papers.

Smt. C. D. Satpute, of the Intellectual Property Training Institute (IPTI) Nagpur, said that IPR has been the subject of intense discussion but except for a few experts, only a few have any idea about IP

and its role in the economic and technological development of the country. Resource persons from IPTI, Patent Office, Delhi, Dept. of Industrial Policy and Promotion,

Delhi and NRDC, Delhi delivered the lectures on topics such as filing National and International applications, patentability, Indian and International Patent Classification (IPC), drafting

of specification, search and examination, opposition, revocation and infringements of patents. Patent valuation, licensing and the commercialization were also discussed. □

### Dr M. Shyam Prasad and Dr G. Parthasarathy selected for National Mineral Awards

**D**R M. Shyam Prasad, Scientist, National Institute of Oceanography (NIO), Goa, and Dr G. Parthasarathy, Scientist, National Geophysical Research Institute (NGRI), Hyderabad have been selected for the National Mineral Award 2003 by the Ministry of Coal & Mines, Government of India in recognition of their significant contribution in the field of Earth Sciences.

Dr Prasad joined the Geological



Oceanography Division of NIO in 1983.

He has been working on tektites or micro-tektites — the products of extraterrestrial impacts on Earth. He began his research with a significant discovery of an aerodynamically ablated tektite in the Indian Ocean, which was published in the premier journal *Nature*. This was the first such finding in a century of tektite research. It disproved some of the earlier concepts on tektite re-entry into the Earth's atmosphere and latitudinal morphological distribution etc. More importantly this finding pro-

vided strong evidence for a single tektite strewn field, which was debated for a long time. This work received spontaneous appreciation from many renowned scientists in the field.

Another of his more significant work came in the form of discovery of micro-impacts on small meteorite-impact-generated spherules called micro-tektites. Micro-impacts produce tiny sub-microscopic craters, which are commonly found on the surface of the Moon. However, this was the first such finding on the Earth. In a series of papers published in the highly reputed journal *Meteoritics and Planetary Science*, USA, he has shown that the micro-impacts represent collisional processes that take place in the evolving ejecta of a major meteorite impact. Whereas, the micro-impacts found on lunar surface have been used to find out the total flux of cosmic dust on the lunar surface, Dr Prasad's work suggested that the fluxes of cosmic dust have been overestimated using the micro-impacts by several scientists for over a few decades. Dr Prasad also found an effective solution to the long-standing problem of 'age paradox' of tektites.

Dr G. Parthasarathy has made significant contributions to the area of high-pressure mineral physics and mineralogy. He has published about 110 papers in peer-reviewed journals and about 80 papers in National and

International conference proceedings during the last 20 years. He has been involved in discovery of natural fullerenes in different geological settings. His work on natural carbonaceous matter and mineralogy of rare carbonates from kimberlite and discovery of novel silica, carbonados, a natural black diamond, have attracted much attention throughout the world. He has also filed three patents in USA, India and PCT. Dr Parthasarathy has been involved in high-pressure experimental studies



in Germany, Cornell University, USA and visited many countries like Russia, USA, Germany, and Japan.

Dr G. Parthasarathy has been selected for this prestigious award for his significant contributions in the area of Experimental Mineralogy and Mineral Physics.

The National Mineral Award will be given at New Delhi in a special function organized by Department of Mines, Government of India, Ministry of Coal and Mines. □