5th June 2006

Director's Report

Prof. Sanjay G. Dhande Director, IIT Kanpur



INDIAN INSTITUTE OF TECHNOLOGY KANPUR KANPUR – 208 016 Honorable Chairman, Board of Governors of the Indian Institute of Technology Kanpur, Professor C N R Rao, distinguished chief guest, Shri Kapil Sibal, members of the Board of Governors, members of the Academic Senate, all graduating students and their family members, all members of faculty, staff and students, invited dignitaries and guests, members of the media, I heartily welcome you all on this occasion of the thirty-eighth convocation of the Indian Institute of Technology Kanpur.

We are particularly happy to welcome Shri Kapil Sibal, Honorable Minister for Science & Technology and Ocean Development, Government of India, amongst us for today's Convocation.

It is with enormous sense of pride that I share with you the news that Professor CNR Rao, Chairman, Board of Governors of IIT Kanpur, has been bestowed with 'Chevalier de la Legion d' honneur' (Knight of the Legion of Honour), the highest civilian award of France. Professor Rao has also been conferred the distinction of being chosen the Chemistry Pioneer of 2005 by the American Institute of Chemists.

ACADEMIC ACTIVITIES

The academic year 2005-2006 has had a successful run. The number of graduating students both at the undergraduate (B Tech-329, B Tech–M Tech Dual Degree (5 year)-21, M Sc (5 year Integrated)-35, M Sc (2 year)-75, Total = 460) as well as postgraduate (MBA-48, M Des-17, M Tech-369, Ph D-42, Total = 476) level shows a fairly satisfactory trend. The enrolment in the Doctoral programme as well as the publication record of the faculty members and students for the academic year 2005-2006 has shown considerable increase. Faculty members and students published more than 1000 research papers in journals and conference proceedings. A list of books published by the faculty members is given in the appendix of this report.

An initiative in the area of Environmental Sciences and Engineering is being undertaken utilizing the MPLADS funds given by Shri Arun Shourie. The construction of a facility has already started on a plot area of 17,500 square meters. The building will house laboratories, seminar and discussion rooms for various disciplines of the environmental sciences. The architecture incorporates most of the features of a Green Building in compliance with TERI Griha Certification. The proposed Centre will be involved in developing futuristic technologies in the area of environment that will confer immediate benefits to the society. Certain urgent concerns will be addressed including the abatement of pollution from industries and process plants, conservation of groundwater

and surface water, abatement of air pollution, ozone depletion, health risk assessment due to modern technologies, etc.

AWARDS AND HONORS

The faculty and students of IITK continue to break new grounds in the forefront of research. This has been duly recognized in the form of various awards and honors to the faculty including Fellowships of professional societies, Editorship of international journals, and best paper awards to the students. A representative list of Awards and Honors to our faculty members is included as an addendum to the report.

I am happy to share with you the good news that three of our B.Tech first year students (who will soon move to second year) Ms. Shraddha Katiyar, Mr. Utkarsh Upadhyay and Mr. Peeyush Srivastava have been conferred the prestigious Aditya Birla Award. Two of our B.Tech Second Year students (who will soon move to third year), Mr. Mohit Bansal and Mr.Sameer Behere, have received **Inlaks award**. Mr Gopesh Mittal, B. Tech. student in the second year of Electrical Engineering (who will soon move to third year), has received the **Goldman Sachs Global Leaders Award**. He has been selected to attend the Global Leadership Institute in July 2006 at New York, USA. Two PhD students in the Department of Computer Science and Engineering, Mr. Neeraj Kayal and Mr. Nitin Saxena, have been awarded the **Goedel Prize** for the year 2006 jointly with their thesis supervisor Dr. Manindra Agrawal, for their paper "PRIMES is in P, Annals of Mathematics 160, 1-13 (2004)". The paper was nominated for the prize by Geraud Se'nizergues, Klaus-Joern Lange, and Peter Shor. The award is given jointly by EATCS and ACM. Our hearty congratulations to these students for bringing in laurels to the institute.

IIT Kanpur is proud of Professor Kalyanmoy Deb (Mechanical Engineering) who was conferred the prestigious Shanti Swarup Bhatnagar Award for 2005. Prof. N Sathyamurty (Chemistry), Prof. T K Chandrashekar (Chemistry), and Prof Ashutosh Sharma (Chemical Engineering) received Sir J. C. Bose fellowships of DST. Prof. Arindam Ghosh has been awarded the Fellowship of The Institute of Electrical and Electronics Engineers (IEEE), USA. Prof. N. Sathyamurty (Chemistry) has been awarded the Fellow of the Third World Academy of Sciences (FTWAS). Professor Kalvanmov Deb (Mechanical Engineering) and Prof. S. K. Gupta (Chemical Engineering) have been selected for the Fellowship of the Indian Academy of Sciences (2005). Prof. Sanjay Mittal (Aerospace Engineering) has been chosen for the Fellowship of Indian National Academy of Engineering (INAE). The Swarnajayanti Fellowship, given by the Government of India, recognizes outstanding young researchers who explore new frontiers in science and technology. Dr. P. K. Panigrahi of Mechanical Engineering and Dr. Sandeep Verma of Chemistry department have been recipients of this Fellowship in 2005. Prof. Harish Karnick and Late Prof. J. L. Batra have been honored with the **Distinguished Teacher Award** of IIT Kanpur for 2005.

RESEARCH & DEVELOPMENT

The institute has witnessed significant growth in its Research and Development activities in diverse fields of Science and Technology during the year 2005-06. The faculty members and research engineers/ scientists of the institute are engaged in executing, at any time, about 500 sponsored projects and about 350 consultancy projects. Last year, the institute received a total research grant of approximately 550 million rupees for sponsored projects and 41 million rupees for consultancy projects, respectively.

The institute faculty have filed about 14 patents in India overseas last year. Moreover the institute has also and signed several Memorandums of Understanding with international academic/ research institutions and industries. within India and abroad, to strengthen its collaborative research efforts. Some of these organizations are: Vikram Sarabhai Space Centre (VSSC), ISRO, Thiruvananthapuram, Altera International Limited, Hong- Kong, Cornell University (Cornell), The California Institute of Technology (Caltech), Honda R&D Co. Ltd. Recently the Institute has collaborated with Intel Technology India Pvt. Ltd., (Intel), National Yunlin University of Science & Technology, Taiwan, Neurogen Corporation, USA etc.

Over the past few years, the institute has embarked proactively on taking up collaborative product oriented R&D projects involving joint participation of industries, R&D labs and government organizations. Setting up of the Samtel Centre for Display Technologies (SCDT) has been one of the most successful efforts in this direction. The SCDT has proposed to develop a prototype of a commercially viable full colour Organic Light Emitting Diode (OLED) display jointly with Samtel Industries. The Prototype Development Unit (PDU), as tripartite collaboration between IIT Kanpur, Samtel and DST, with a mandate to make a prototype of an OLED display came into being in June 2005. The mandate represents a complete display solution in a product form for a cutting edge technology. It is a tripartite collaboration between academia (IIT), industry (Samtel) and the government (Dept. of Science and Technology) and aims towards development of a product that has immediate commercial relevance; interestingly, the targeted user who has been intimately co-opted in the development cycle provides the required personnel right at the start. The project has a band of engineers deployed by Samtel Colour Ltd in SCDT, IIT Kanpur, who are jointly responsible for the execution of this project, along with IIT Kanpur faculty members, in a period of three years at an approximate cost of Rs. 16 Crore. In the last one year, a Class 1000 clean room has been established, first in IIT Kanpur and perhaps among the very few in the academic institutions of the country. All major equipment have been installed, in accordance with the plan to produce the first prototype display before the end of the year. Moreover, the center has carried forward its research

agenda in developing other applications of organic semiconductors such as Organic Solar Cells, Organic Thin Film Transistors and has even achieved significant scientific milestones in their development.

A project funded by the Ministry of Communication and Information Technology (MCIT) aims to develop large area MgO coatings for 42 inch size TV sets based on plasma display panels (PDP). The MgO coating is a key component with limited information in public domain that determines the voltage and lifetime as well as the cost of the PDP displays. This is a closely guarded technology which is of significant economic advantage to the country. The project aims to develop the technology indigenously using reactive magnetron sputtering.

IIT Kanpur is one of the eight Institutes chosen by the Department of Science and Technology (DST) for creating a state-of-the-art Nano Science and Technology Unit. The unit has taken up a project which has a committed funding of about Rs. 12 Crore. It has installed several characterization facilities such as Focused Ion Beam, e-beam Patterning, Maskless Lithography, Micro-Raman, SPMs, NSOM, Laser Ablation, Surface Profilers, Spin Coating, Nano-positioners, etc. The research work carried out by a core team of about 20 faculty members from across the departments will achieve its magnetic target using resources on materials. nanostructuring of soft materials and surfaces for optoelectronics and bulk-nano applications including optical coatings, super

hydrophobic coatings, smart adhesives, nano-fluidics, superbatteries and capacitors, carbon MEMS and sensors.

The Institute is also setting up a Centre for Nanotechnology somewhat similar to the SCDT and looks forward to building on and extending its achievements in organic electronics. The Centre is ambitious towards making electronics printable through the use of a variety of nanotechnologies. A sum of Rs 12.15 Crore has been sanctioned by the Department of Science and Technology (DST) for this effort including development of a unique multiple source Focused Ion Beam. It will lead to demonstration of printable radio-frequency identification tags as a prototype demonstrator of this rapidly emerging class of applications.

The Technology Mission on Rail Safety (TMRS) started in the year 2005 and all the projects have successfully completed a year after the incubation of about 6 months. In various projects like Track Side Bogie, Derailment Detection Devices, On-Board Diagnostics, Sensors for Hot Boxes & Hot Wheels, the laboratory tests were conducted successfully on the prototype. The prototypes are kept on the field for testing and validation. The projects have reached a stage, where various industrial partners are getting involved to jointly develop commercial scale models to be commissioned on the trains for the field trials.

Environmental Friendly Coach Toilet Discharge System was made with the help of the industry partner and was kept under testing within the institute. Material compositions for the rail and track are finalized in the projects like Wheels & Axles of Improved Metallurgy, Corrosion Prevention of Rails, and Improved Rail Fastenings. In all these projects, every lab scale model was fabricated using the new compositions and also they were tested successfully. A major achievement has been in the Satellite Imaging for Rail Navigation (SIMRAN) project under this mission. More than 9500 stations have been covered under this project with over 5300 GPS locations on the track. Ten different hardware devices have been developed and are being tested rigorously on various routes of the Indian Railways.

IIT Kanpur has also received a grant from Swiss National Science Foundation (SNSF) under the Swiss program on Research Partnership with Developing Countries. SNSF had invited Joint Research Projects from the Developing Countries (besides India) on all areas of Science and Engineering. IITK-ETH proposal won the research contract after a three-tier scrutiny process involving a large number of proposals. This project in partnership with ETH Zurich aims at developing Low Cost and Flexible Solar Cells for the Developing Countries.

The institute has received grants for 'Design and Development of an Autonomous Mini Helicopter' from the Department of Science and Technology. This project is multi-disciplinary and has two major components. The first part involves structural design and the development of a mini helicopter, test bed for performance measurements, control law design and validation. The second part includes design and development of Avionic packages such as sensing and actuation, communication, navigation, automatic flight control and ground control, for autonomous flight of a mini helicopter, flight testing of autonomous helicopter and expanding the utility by making the vehicle perform the intelligent tasks. Even though the autonomous helicopter will be developed for a few kilograms of weight (6 to 8 kg.), it will have the full functionality of a real life helicopter. It is envisaged that the technology developed will be useful for several civilian applications including the mapping of terrain, forestry, seed and pesticide spraying, law enforcement etc.

Under a National Mission on Power Electronics Technology (NAMPET) of MCIT, IIT Kanpur has been chosen as one of the major participating institutes for creating a Centre of Excellence on Power Electronics Technologies. CDAC Trivandrum is identified as the nodal agency. The ministry is funding the setting up of a NAMPET research lab in the Electrical Engineering Department of the Institute to undertake projects of national importance in the area of Power Electronics and its applications. The vision is to realize production of reliable and deployable technologies in the area of Power Electronics, not only through theoretical analysis, but also through demonstrable hardware prototypes.

Indo-US Science & Technology Forum has provided funding to sponsor a Joint Center for "Advanced and Futuristic Manufacturing" in the next two years. The center will be established under a collaborative venture between IIT Kanpur, IIT Kharagpur (India) and the University of Illinois at Urbana Champagne, Illinois, University of California, Irvine, North Western University, Evanston (USA).The Indo-US S&T Forum has evinced interest in establishing the Centre at IIT Kanpur with a view to fostering collaboration through exchange visits and also execution of joint projects in the following areas of Micofabrication, Micro devices/MEMS, and Bio-microfluidics and Self Assembly.

Some of the other major sponsored projects undertaken by the institute include: Non-neuronal cell mediated neuroprotection in neuro-degenerative disease Amyotropic lateral Sclerosis (ALS) sponsored by DBT; Ruralnet (Digital Genetic II) by MLA; Confirmational Dynamics of Biomolecules in Suoer Sonic Jet Expansion Infrared- Ultraviolet Double Resonace Spectroscopy by DAE; Experimental Investigation of the Characteristics of Exhaust Flow Field and Noise Field from a Detonation Tube by ISRO; High Speed Coarse WDM Waveguide Photodiodes by Quantum well Intermixing by DST; Drop-wise condensation on an inclined surface exposed to a vapour flux funded by DAE; Corrosion Resistant Coatings for Rare Earth-Iron Alloys and Compound funded by DRDO; Data Compression Techniques & Its Applications to E-Learning/Education sponsored by DIT; National Facility for Core Archival & Analysis by DST; Inertial MEMS Unit (IMO) for Automotive Application; Infrastructure Development for Indo-French Cyber University by MHRD; and. New Methodologies for Image and Video Compression by MCIT.

A few major consultancy projects received last year include Synthesis of Fragment funded by NRGN; Reactor and Slurry Bubble Column Hydrodynamics funded by CHEVRON, Prediction of Aerodynamics Parameter Aerodynamic load and Stability Characteristic of FAE Bombs by HEMRL; Evaluation and Importance of TUNDISH performance at Hospit funded by MUKAND; Hierarchical Access Methods by INFOSYS: Push over Analysis of Retrofitting Option for MSO Building at Delhi funded by PWD; Stack and Ambient Quality Sampling in Singrauli Area by CPCB, Distributed/ Parallel optimization Capability Development funded by GE; Consultancy on Design of Base –Isolated Hospital by MES; and, Hydraulic Model Study for Bridge to be built over River Ganga funded by NHAI.

RESEARCH INFRASTRUCTURE DEVELOPMENT

The Institute is adding several major infrastructural facilities for carrying out multidisciplinary R&D activities. It is in the process of setting up a state of the art centre for Micro Beam facilities. A Focused Ion Beam equipment, Nova Nano Lab600 manufactured by FEI Netherlands, has been installed in the Nuclear Physics Lab of the Physics Department. This facility has been partly funded (Rs. 4.5 crore) by DST under a NSTI Project, and has a support of about Rs. 2 Crore from the institute. This state of the art system combines high resolution (<10nm) patterning and imaging capability. An ion column produces Ga ions of energy which can be varied from 5 kV to 30 KV and can be focused down to 5 nm with beam current

density exceeding several Amperes per square centimeter. This makes it a powerful tool for rapidly fabricating a micro size prototyping device or for producing novel nanostructures to explore new science at nanolevel. This equipment promises to be an indispensable tool for rapid development of emerging technologies which utilize micro and nanostructures. It is ideally suited for cross-disciplinary research and development areas such as "Futuristic Manufacturing" and "study of nano materials and devices".

Under the IRHPA (Intensification of Research in High Priority Areas) scheme, the Department of Science and Technology is providing a grant of Rs.15.60 Crore for the purchase of a Tandem accelerator with a dome voltage of 1.7 MV and with a capability of producing high current (up to 70 microAmp) ion beams of several elemental species, besides a nuclear microprobe facility and other accessories. The focus of the project is to effectively address the frontline issues in micro beam analysis, materials synthesis and modification, micromachining, proton and heavy ion beam writing, MEMS and NEMS fabrication. Materials Science and Biosciences applications.

The Department of Chemistry has received a grant of Rs. 2.75 Crore for setting up a "500 MHz Nuclear Magnetic Resonance (NMR) Spectrometer" facility in the department. Under the CARE scheme, the Institute supported Rs. 149.23 lakhs for setting up a Scanning Mobility Particle Sizer (SMPS) for Gas-Borne Nanoparticulate Systems in the Civil Engineering Department, Reciprocating Wear and Friction Tester Facility in ACMS, Augmentation of ESI-Q-ToF with Atmospheric Pressure Chemical Ionization (APCI) and Photoionization (APPI) Interfaces facility in the Chemistry Department, Servo-Hydraulic Actuators for Load Application at Structural Engineering Laboratory in the Civil Engineering Department, Hot-Isostatic Pressing Facility for Processing Advanced Materials in the Mechanical Eng. Department, and Polarized Confocal Imaging of the Cervical Epithelial Tissue for Neo plasia (early cancer) Detection in the Physics Department.

FINANCIAL RESOURCE MOBILIZATION

The Institute has had a satisfactory financial year during 2005-06. The total non-plan grant(s) from MHRD was Rs 68 crore and that from the total plan funds was Rs 34.5 crore. I am sure that we will be able to cope well, thanks to the able guidance of our Chairman and the support of the alumni and other wellwishers of the Institute.

The last financial year has also been very successful for fund raising at IITK. The total number of donors this year was about 550 as compared to about 200 last year and the total amount of donation received was Rs 2.6 crore as compared to Rs 1.9 crore last year. Even though the total amount received through batch donations dropped this year to Rs 0.95 crore (from Rs 1.8 crore last year) the other donations (scholarships, chairs, etc) increased from Rs 0.72 crore to Rs 1.69 crore. The recently launched Annual Gift Programme has been well received. About 120 donors have donated a total of Rs.12.74 lakhs with a median donation of Rs.4, 500/- and an average donation of Rs.10, 500.

During this year, a new programme was initiated to extend partial travel support to students from the donations and the endowments. 49 students were awarded partial travel support for participation in conferences overseas, of which 43 were able to avail this support.

Several new chairs have been created for outstanding faculty members of the institute by our alumni. The donors include Mr. Lalit M. Kapoor (B.Tech/CHE/1971), Mr. Deepak Devraj (B.Tech/EE/1970) and Mr. Ravindra Nath Akhoury (B.Tech/EE/1968). Several new scholarships and awards have been instituted for students.

The Sachchidanand Memorial Fund to support needy students at IITK received a good response from the donors. The corpus of the fund now stands at Rs 12 lakhs. The Pioneer Batch (1965 graduates) has contributed about \$10,000 towards this fund.

This year we started the Summer Undergraduate Research Programme (SURGE) to encourage undergraduate student research. An MOU with California Institute of Technology (Caltech) has enabled student exchange with Caltech. 10 IITK students and 11 NIT students are working at IITK this summer under the programme. 3 Caltech students will join later this summer. 3 IITK students are currently doing summer research at Caltech.

There is enormous potential to improve the quality of education and research at IITK with support and active engagement of our alumni. The Institute is embarking on an ambitious plan towards this and I invite each and every alumni and well wisher of IITK to come and join hands with us in this endeavour.

STUDENT ACTIVITIES

IIT Kanpur has always striven to encourage an equitable balance between academics and extra curricular engagements among its students. The intention is to create future leaders in their chosen fields and not just technically accomplished individuals. The Institute strongly believes that an abiding social and humane engagement is the hallmark of its students. This feeling is nurtured by the institute in the support it provides to various social, cultural and sporting activities pursued by the Student Gymkhana and other student groups.

A variety of activities are pursued by various clubs coming under the broad ambit of the councils of the gymkhana. They range from clubs like **Prayas**, where students teach children coming from socially disadvantaged and economically deprived backgrounds to the Dramatics club which stages thematically inspired and socially motivated plays. Other technically oriented student groups are engaged throughout the year in pursuing special interests like robotics, electronic aids, animation, aero-modeling and astronomy to name but a few.

Large scale events like Antaragni (Cultural Festival). Udahosh (Sports Festival). Techkriti (Science and Technology Festival), Megabucks (Business Club), Umang (Film Festival) are also organized by the students where there is an emphasis on outside participation to facilitate a dynamic and broadly networked spectrum of social and professional discourses. The Gymkhana Festivals have seen vastly improved participation levels, both from within the institute and also from students from other Indian and International Institutes. The participation from the industry and the student community for the conduct of these well-organized festivals witnessed an impressive growth this year. Certain new initiatives taken this year include Index, an Industrial Exhibition organized as part of Techkriti. It is designed to provide a platform for student-industry interface. Initiatives were taken by the Umang organizing team to contact various film personalities and embassies for the procurement of films and the screening of these on the campus. The efforts bore fruit when Ms. Shonali Bose, Dr. B. Pain, Mr. Sudhir Mishra, Mr. Atul Tiwari, and Ms. Kavita Joshi participated in Umang 2006. Ms. Kavita Joshi also conducted a five-day long film making workshop on the campus.

In the arena of sports, IIT Kanpur came up with a creditable show in the inter IIT sports meet held at IIT Roorkee. IIT Kanpur team performed better than what it did the previous year. IIT Kanpur secured the sixth position in the overall (men) with 8 points and the second position in the overall (women) with 22 points. To strengthen the sports culture, an inter-hall games event called **Josh** was also organized which witnessed mass participation from the students. In order to encourage sports activities among the students, the institute has given twenty sports scholarships of Rs. 500/- each for outstanding performance and leadership abilities in sports.

Other activities like Nature trails, trekking, and mountaineering are being taken up actively by our students. The NCC unit of IIT Kanpur, in addition to maintaining a commendable track record in the group, also organized a para-sailing camp in the Institute this year. Student interests in hobbies like Photography and Music are also being actively encouraged and the Institute is doing all it can in providing the enthusiasts of these and other clubs with the requisite funding and equipment.

Discussion and debate in the student community is being initiated by the general interest student magazine 'Meander'. These journalistic endeavors by the students have been successful in cultivating a broader awareness in the student community about important issues. It facilitates an active personal engagement in the system of redressal and also acts as a sounding board for student opinion. The placement scenario this year has registered a positive upswing with almost 90% of the B. Tech. and 80% of the M. Tech. students registered with the student placement office receiving offers. Invitations have been sent out to nearly 700 public and private organizations and the response from various National and International business majors has been encouraging. Many companies of repute also registered for the on-campus recruitment program for the first time. With an improved facilitation and response system in place, it is hoped that the institute will see even better participation from the industry next year for placement as well as for industrial training programs for the students.

Hostel infrastructure has seen a marked improvement with the renovation of facilities in the respective halls. The construction of Hall-9 is under way. We are happy to note that the sanctioned increase in strength is not going to pose a constraint as the infrastructure plans of the institute have been steadily keeping pace with the proposed increase.

KEY ISSUES

Ever since its inception, IIT Kanpur has taken the lead in technical education and training. It has established itself as one of the top technological institutions in the world especially for undergraduate teaching. In 2009 the institute will be celebrating its golden jubilee year. It is time for us to introspect and assess our strengths and weaknesses and initiate innovative measures to sustain our glorious legacy even while continually reaching for new heights in the globally competitive requirements of technical education.

The institute is currently finalizing its vision document laying down specific objectives and goals to be achieved in the coming future. The institute is trying to strengthen its postgraduate education and also to attain a leadership position in research and development. It is proposed to set up review committees for both undergraduate and postgraduate programmes to suggest changes in the curricula in line with the new technological and societal needs.

Research in an institute of technology can be carried out only with the cooperation of industry. These are times when the road from "knowledge to wealth" can be traversed jointly by academia, industry and government. Our experience of Samtel Centre and Railway Technology Mission has shown that a new paradigm of research and development can be fostered in this country. As India becomes a major power in the world, this approach to technology development will become a key ingredient in our process of economic growth. IIT Kanpur wishes to strengthen the environment of technology development through such tripartite research activities.

The Institute has strengthened its relations with international institutions and organizations to foster collaborative research activities, exchange of faculty and students. It has already

signed MOU with several leading universities from the USA, Canada, Europe, Taiwan, Japan and other parts of the world. This will provide opportunities for working jointly on cutting edge technologies and also for complementing mutually the strength of the institutions involved in their academic and research standards.

CLOSING REMARKS

Dear graduates, on this occasion of the thirty-eighth convocation, I offer my hearty congratulations to each one of you. This Institute has given you the knowledge as well as a unique value system. My sincere wish is that you should all excel in your professional career. Some of you will choose to work in the industry, some of you will choose to go in for higher studies, some of you will opt for a career in management, and some of you will prefer to serve the country as civil servants. Whatever be your chosen profession, please remember that excellence and integrity should remain your guiding principles. Always remember the symbiotic relationship between science, technology and the society. The Chairman, the members of BOG and my colleagues are all with me in wishing you the best. This Institute has helped you to internalize several principles, acquire some special skills, and gain knowledge of several fields. All these translate into the basic capital of your life. While the journey ahead constitutes the real learning for you, be assured that the spirit of IITK which you have imbibed will act as your conscience and help you negotiate the crises and perils of this journey. It is people like you who keep IITK flag flying high. You are now our alumni. We are proud of you. Your contributions will enrich the heritage of IITK. We will always be keen to hear about your success. Our relationship now graduates to that of mutual friends. This new relationship is the most beautiful treasure that you will own from today. We all wish you and your families all the best.

Jai Hind.

AWARDS AND HONORS

- Prof. CNR Rao, has received the Dan David Science Prize for 2005 in Materials Science. He shares the award with George Whitesides of Harvard University and Robert Langer of Massachusetts Institute of Technology. Prof. Rao, one of the world's foremost solid state and Materials Chemists, was honored for his stellar contributions to the development of the field for well over five decades. The awards ceremony was held on May 23, 2005.
- Professor CNR Rao, Chairman, Board of Governors of IIT Kanpur, has been awarded the highest civilian award of France: Professor Rao has been conferred the title 'Chevalier de la Legion d' honneur' (Knight of the Legion of Honour). Also Professor Rao has been named the Chemistry Pioneer of 2005 by the American Institute of Chemists.
- Dr. Kalyanmoy Deb, Professor in the Department of Mechanical Engineering, has received the Shanti Swarup Bhatnagar award for the year 2005.
- Dr.Arindam Ghosh in the Department of Electrical Engineering has been elected an IEEE Fellow for his "contributions to education in power electronic applications to transmission and distribution systems".

- Dr. N Sathyamurty and Dr. T K Chandrashekar, Professors in the Department of Chemistry, and Dr. Ashutosh Sharma, Professor in the Department of Chemical Engineering, have been selected for the award of J C Bose Fellowships.
- Dr. N. Sathyamurthy, Professor in the Department of Chemistry, has been elected a Fellow of the Third World Academy of Sciences (FTWAS) in recognition of his outstanding research contributions.
- Dr. Kalyanmoy Deb, Professor in the Department of Mechanical Engineering, has been elected a Fellow of the Indian Academy of Sciences.
- Dr. S. K. Gupta, Professor in the Department of Chemical Engineering, has been elected a Fellow of the Indian Academy of Sciences.
- Dr. Sanjay Mittal, Professor in Aeronautical Engineering, has become a Fellow of the Indian National Academy of Engineering (INAE).
- Dr. Deepak Mazumdar, Professor in MME Department, has been elected a Fellow of the Indian Institute of Metals.

- Dr. S. N. Singh, Associate Professor in Electrical Engineering Department, received the Alexander von Humdoldt Fellowship for the year 2005.
- Dr. Shalabh, Assistant Professor in Mathematics & Statistics Department, received the Alexander von Humboldt Fellowship for the year 2005.
- Drs. PK Panigrahi of Mechanical Engineering and Sandeep Verma of Chemistry have been awarded the prestigious Swarnajayanti Fellowships for the year 2005. These fellowships are for scientists, in the age group of 30 to 40, carrying out outstanding research in science and technology.
- Dr. Avinash Kumar Agarwal, ME has been selected for the INAE Young Engineer Award-2005. This award of the Indian National Academy of Engineers will be presented to Dr. Agarwal on December 10 at the Annual Convention of the Academy.
- Dr. Yogesh M. Joshi, Assistant Professor in the Department of Chemical Engineering, has received the INSA Medal, Young Scientist award of the Indian National Science Academy (INSA) for 2006.

- Dr. Ashu Jain, Associate Professor in the Department of Civil Engineering, has been elected a Fellow of the Indian Water Resources Society.
- Dr. S. K. Singh, Assistant Professor in the Department of Humanities and Social Sciences, received the 'Manas Chatterji Award for Excellence in Research in Regional Science, during the Regional Science Association International (RSAI) Symposium held at the Indian Institute of Management Bangalore during Jan. 6-8, 2006.
- Drs. Amalandu Chandra and Sandeep Verma in the Department of Chemistry have been chosen for the Award of bronze medals in the Chemical Research Society of India (CRSI) called "CRSI Medals" for this year.
- Dr. Bikramjit Basu, Assistant Professor in the Department of Materials & Metallurgical Engineering, has been invited to join the editorial board of Society's Journal Trends in Biomaterials and Artificial Organs Organization, Thiruvananthapuram.
- Dr. Anish Upadhyay, Assistant Professor in the Department of MME, has been invited to serve for two years on the Editorial Board of the "Transactions of the Indian Ceramic Society," the quality journal of the Indian Ceramic Society.

- Dr. VK Jain, Professor in the Department of Mechanical Engineering, has been invited to serve on the editorial Board of the "International Journal of Nano-manufacturing." The publisher of the journal is Inderscience Publishers, UK.
- Dr. V K Jain, Professor in the Department of Mechanical Engineering, has been appointed a member of the Editorial Board of the IJAMT -"International Journal of Advanced Manufacturing Technology" being published by Springer Verlag (U.K.).
- Dr. N G R lyenger, Professor in the Department of Aerospace Engineering, has been invited to join the Editorial Board of "International Journal of Structural Stability and Dynamics" (IJSSD).
- Dr. Ashutosh Sharma, Professor in the Department of Chemical Engineering, has been invited to serve on the International Advisory Board of the Canadian Journal of Chemical Engineering (CJChE) for two years beginning January 2006. CJChE is an International Journal of high repute.
- Dr. Ashutosh Sharma, Professor in the Department of Chemical Engineering, has been invited to join the Editorial Board of Indian Chemical Engineer (ICE).

- Dr. Ashish Dutta, Assistant Professor in the Department of Mechanical Engineering, has become a member of the Editorial Consultant Board of the International Journal of Advanced Robotics Systems.
- Dr. K Bikramjit Basu, Assistant Professor in the Department of Materials & Metallurgical Engineering, has been invited by the Korean Ceramic Society to serve as one of the Foreign Editors for its Journal.
- Dr. Ashu Jain, Assistant Professor in the Department of Civil Engineering, has been elected a Fellow of the Indian Water Resources Society.
- Dr. K K Saxena, Professor in the Department of Humanities and Social Sciences, has been unanimously elected the Chairman of the Senate Nominations Committee for the calender year 2006 i.e., upto 31.12.2006.
- Dr. Jitendra Kumar, Professor in the Materials Science Programme, has been nominated the Guest Editor of the Special issue of the "International Journal of Nanotechnology", published by Interscience Enterprises Ltd., Geneva, Switzerland. The special issue will be on "Nanotechnology in India."

- Dr. R Balasubramaniam, Professor in the Department of Materials & Metallurgical Engineering, has been recently invited to serve on the –
 - Editorial Board of Journal of South Asian Archaeology and
 - Editorial Advisory Board of the Transactions of the Indian Institute of Metals.
- Dr. Joydeep Dutta, Assistant Professor in the Department of Mathematics & Statistics, has been invited to join the Editorial Board of a new journal entitled "International Journal of Modern Mathematics." The Journal is being published by the Dixie W Publishing Albama, USA.
- Dr. S.C. Srivastava, Professor in the Department of Electrical Engineering, has been nominated Member of the Governing Council of Central Power Research Institute, Bangalore. He also has been elected the Vice Chairperson, Technical Committee of the IEEE India Council.
- Dr Manindra Agrawal, Professor in the Department of Computer Science and Engineering, and his PhD students Neeraj Kayal and Nitin Saxena have been awarded the Goedel Prize for the year 2006 for their paper "PRIMES is in P, Annals of Mathematics 160, 1-

13 (2004)". The paper was nominated for the prize by Geraud Se'nizergues, Klaus-Joern Lange, and Peter Shor. The award is given jointly by EATCS and ACM.

- Dr. S.N. Tripathi of the Civil Engineering Department has been appointed by DST as a Member of the Cloud and Aerosols steering Committee for the proposed mega CTCZ experiment of DST's Indian Climate Research Program
- Prof. P.K. Bhattacharya obtained a Patent (India-189310) on "Process for the Recovery of Inorganic Chemicals from Kraft Black Liquor".
- Dr Bishakh Bhattacharya obtained a US Patent on Vibration Damping using Magnetostrictive Actuators and Sensors jointly with Professor Geof Tomlinson and Dr. Jem Rongong, United States (Patent number 688439).
- Dr. D. Goswami and Mr. M. Sinha of Chemistry Department obtained a US Patent (US2004/0208613 Al) on "System and Method for Improved Coherent Pulsed Communication System having Spectrally Shaped Pulses".
- Dr. S. S. Manoharan, Professor in the Department of Chemistry, has received a US Patent (Patent No. US)

679341 B2 dated 21st September 2004) for his work on "Magneto Resistive CRO2 Polymer Composite Blend".

 An Indian patent of Dr. S. S. Manoharan, Ranjan Kumar Sahu, Manju Lata Rao, M. Qureshi, and J. Prasanna, from the Department of Chemistry, on "A novel method to prepare Gamma Iron oxide" has been accepted in April 2006.

BOOKS PUBLISHED

- Drs. G.K. Lal (now retired) and S.K. Choudhury of the Department of Mechanical Engineering have written a book titled "Fundamentals of Manufacturing Processes", which has been published simultaneously by Narosa (New Delhi) and Alpha Science (London).
- Dr. G.K. Lal, in the Department of Mechanical Engineering (now retired), Dr. Vijay Gupta, in the Department of Aerospace Engineering and Dr. NV Reddy, in the Department of Mechanical Engineering have written a book entitled "Fundamentals of Design and Manufacturing" which has just been published. The publisher is Narosa, the publication is in the Institution of Engineers (India) text book series.
- A new book entitled "Geo Environmental Design in Fly Ash Disposal and Utilization" written by Dr. Umesh

Dayal, (now retired) and Dr. Rajiv Sinha of the Department of Civil Engineering has just been published. The publisher of the book is Allied Publishers Pvt. Ltd.

- Dr. R. Balasubramaniam, MME has just published a new book titled "The World Heritage Complex of the Qutub." The book details the complete history and engineering of the archeological structures of the Qutub site. The book is published by the Aryan Books International.
- A book titled "Story of the Delhi Iron Pillar" written by Dr. R. Balasubramaniam, Professor in the Department of Materials & Metallurgical Engineering, has just been published by the Foundation Books, New Delhi.
- Dr. Veena Bansal, Department of Industrial and Management Engineering, authored a book on 'Computing for Management', published by Prentice Hall of India Pvt Ltd, New Delhi, June 2005.
- Dr. Jayanta Chatterjee (IME Department) and T.V. Prabhakar (CSE Department) edited "Kheti – A Multilingual Multimedia Thesaurus for Indian Agriculture" Volume I, 2006, published by Media Lab Asia (www.kheti.org.in).