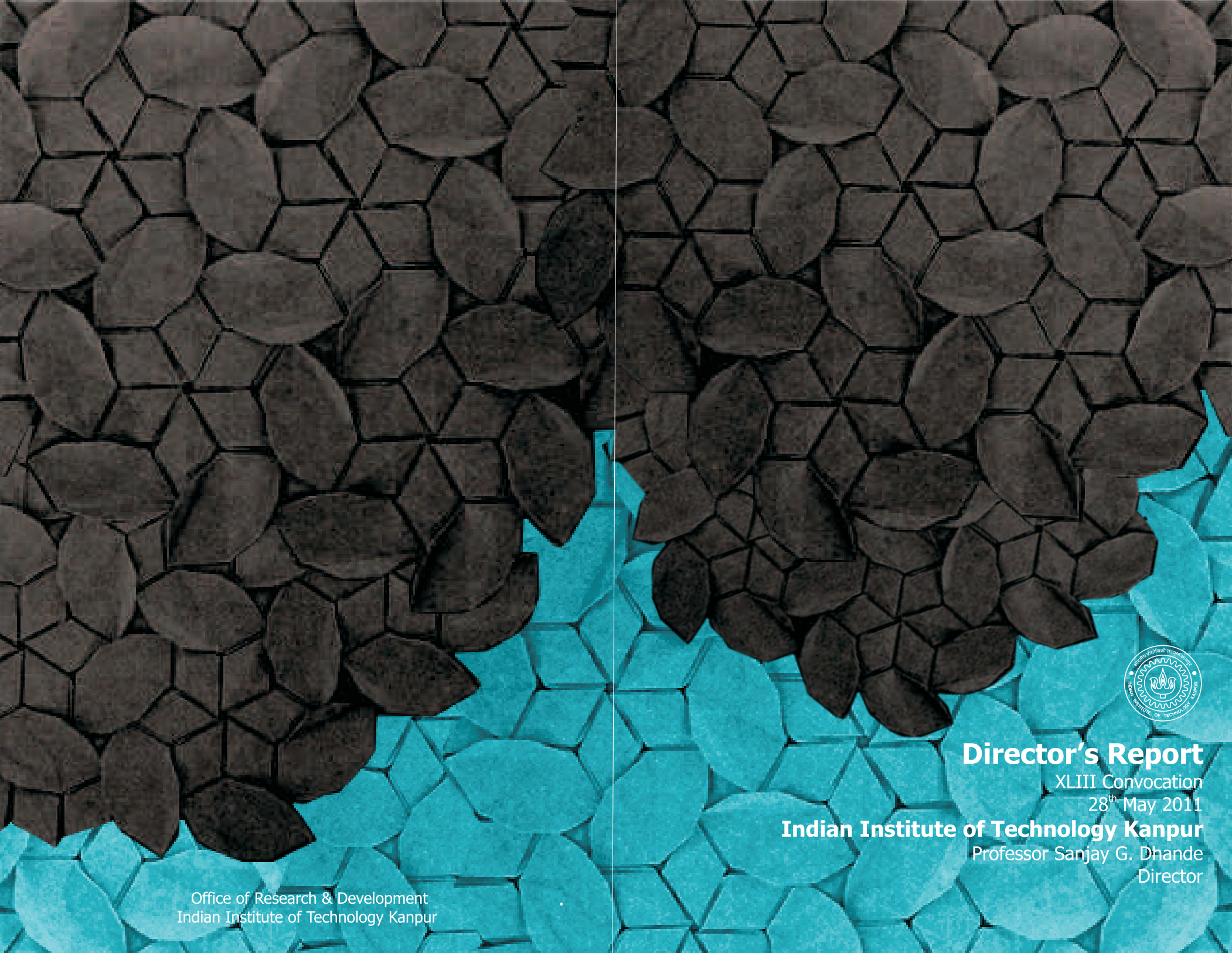

Director's Report

XLIII Convocation

28th May 2011

Indian Institute of Technology Kanpur

Professor Sanjay G. Dhande

Director

Office of Research & Development

Indian Institute of Technology Kanpur

Honorable Chairman, Board of Governors of the Indian Institute of Technology Kanpur, Professor M. Anandakrishnan, Distinguished Chief Guest, Prof. P. Balaram, 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, guests, and members of the media: I heartily welcome you all on this occasion of the forty-third convocation of the Indian Institute of Technology Kanpur.

We are particularly happy to welcome Prof. P. Balaram, Director, Indian Institute of Science, Bangalore, amongst us for today's forty- third convocation.

The academic year closing in May 2011 has been momentous, and I consider it a privilege to review our activities pertaining to this period.

ACADEMIC ACTIVITIES

The academic year 2010-11 has had a successful run. The number of graduating students both at the undergraduate: B Tech - 313, M Sc (5 year Integrated) - 67, B Tech – M Tech Dual Degree (5 year) - 100, M Sc (2 year) - 103 and the postgraduate: M Tech - 242, M Des - 8, MBA - 43, VLFM - 59, PhD - 103 levels shows a satisfactory trend. The enrollment in the Doctoral program as well as the publication record of the faculty and students for the academic year has considerably increased. Faculty and students published a large number of research papers in journals and conference proceedings. Books published by the faculty are listed at the end of this report.

AWARDS AND HONORS

The Institute has played a significant role in pushing the frontiers of knowledge. Our faculty, students and staff have created a niche for the Institute in the world of science and technology. This has been duly recognized in the form of various awards and honors to the faculty including fellowships of professional societies, editorships of international journals, and best paper awards to the students. Awards and honors to our faculty are listed at the end of the report.

Our students Vishal Gupta, Abhijit Sharang have been conferred the prestigious *Aditya Birla Scholarship*. Umang Khandelwal, Priya Gautam, Kartikey Asthana, Ankit Jain received the *O P Jindal Engineering & Management Scholars Scholarship*. Mainak Chowdhury, Raghav Khanna, Bhuwan Dhingra, Puneet Singh, Palak Bhushan, Vishwas Aggarwal, Asish Mahapatra, Akshay Agrawal received the *Japanese TODAI Scholarship.* It is my pleasure to inform you that this year all the 8 TODAI scholarships have been awarded to IITK students.

Mr. G. C. Patil, Research Scholar (EE), bagged the Best Paper Award for his presentation in the 4th International Student Workshop on Electrical Engineering at Kyushu University, Fukuoka, Japan. Mr. Raghvendra K Chaudhary, Research Scholar (EE), won the Best Student Paper Bronze Award in IEEE, APACE 2010, Port Dickson, Malaysia. Ms. Archana Srivastava, Research Scholar (HSS), bagged the Best Paper Award and Fellowship of the World Business Institute, Australia for her presentation at the Pacific Business Research Conference. K. Shravan Kumar (MSE) received the Best Paper Presentation award at the Annual Technical Meeting of IIM Bangalore. Saurabh Hadas's (MSE) M.Tech thesis titled "Effect of Initial Porosity and Tempering on the Microstructural Evolution and Mechanical Properties of Sinter-Hardened

Steels" was awarded Professor B. D. Upadhyaya Memorial Gold Medal for the best thesis in the materials processing and physical metallurgy area in the department.

Prof. Sandeep Verma (CHM) has been conferred the prestigious *Shanti Swarup Bhatnagar Prize* in Chemical Sciences. Prof. Sanjay G. Dhande (CSE) & (ME), Director of the Institute, has been awarded the *Dewang Mehta Business School Award* for his outstanding contribution to higher education in India. Prof. Ashutosh Sharma (CHE) received the first *Infosys Prize in Engineering and Computer Science* and also was elected fellow of the *Third World Academy of Sciences*. Prof. R. P. Chhabra (CHE) has been elected a Fellow of the *National Academy of Sciences*. Prof. Manindra Agrawal (CSE) received the *Humboldt Research Award* and the *TWAS* prize in Mathematics. Profs. Debashish Chowdhury (PHY), Kalyanmoy Deb (ME), Sanjay Mittal (AE) and V K Singh (CHM) have been elected Fellow(s) of the *Indian National Science Academy*. Profs. V. Chandrasekhar and R. N. Mukherjee (CHM) have been chosen to receive the *Chemical Research Society of India Silver Medal* for the year 2011. Profs. Y. D. Vankar (CHM) and G. Biswas (ME) currently Director, CMERI, Durgapur, have been awarded the *J. C. Bose Fellowship.* Prof. Dipak Mazumdar (MSE) has been selected for the *Indian National Academy of Engineering Chair Professorship*.

Prof. Suchitra Mathur (HSS) has been chosen for the *Gopal Das Bhandari Memorial Distinguished Teacher Award* given by the Institute. Late Prof. R. Balasubramaniam (MSE), late Prof. S. D. Joglekar (PHY), late Prof. V. N. Kulkarni (PHY), Dr. Amit Mitra (MATH) and Dr. S. S. K. Iyer (EE) have been awarded the *Distinguished Teacher Award* for the year 2010.

Dr. S. Ganesh (BSBE) has been chosen for the *DAE-SRC Outstanding Research Investigator* award. Dr. Priyanka Ghosh (CE) has been conferred the *Outstanding Young Investigator Award* by the International Association for Computer Methods and Advances in Geomechanics. Dr. Jayant Kumar Singh (CHE) has won the *Amar Dye-Chem Award* (2010). Prof. T. K. Chandrashekar (CHM), currently Director of NISER Bhubaneswar, has been conferred the *D. S. Kothari Gold Medal* at the Indian Science Congress. Dr. Anindita Chakrabarti (HSS) has received the prestigious *Professor M. N. Srinivas Memorial Prize 2010* awarded by the Indian Sociological Society. Dr. S. Mahesh (ME) has been selected for the *INAE Young Engineer Award* 2010. Dr. Kantesh Balani (MSE) has received the *INAE Young Engineer Award* 2010 as also the *2010 Young Metallurgist* of the Year. Dr. Krishanu Biswas (MSE) has been selected for the *BOYSCAST fellowship* of the DST. Dr. Bikramjit Basu (MSE) has been selected for

the Ministry of Steel funded *Best metallurgist* of the year award.

RESEARCH & DEVELOPMENT SCENARIO

During 2010-2011, 127 sponsored projects worth ₹ 10652 lakh and 97 consultancy projects of value ₹ 898 lakh were sanctioned. Major grants sanctioned by various agencies during the year are DST ₹ 2988 lakh, MHRD ₹ 2070 lakh, MOEF ₹ 1648 lakh, MNRE ₹ 687 lakh, ADA ₹ 566 lakh, and DBT ₹ 564 lakh. Some of the major research organizations or industries which have funded projects at IITK are HAL, Intel, NTPC, RDSO, L&T, TCS, Microsoft Research India, GE India Technology Center, ICRISAT, IGCAR, NTPC, CDAC, ISRO and BARC. A list of major projects is given at the end of the report. At the international level, organizations like Chevron, NASA, IHI, Boeing, P&G, Honda have funded our research.

I am extremely happy to share with you the wonderful news that a paper titled *Melting of the Earth's Inner Core* co-authored by Dr. Binod Sreenivasan (ME) has been published in the prestigious journal **Nature**. The Institute has filed over 28 patents during the last year. Also, 11 inventions have been accepted by *Intellectual Ventures* for patenting and commercialization. In the last financial year, our earnings from intellectual property is close to $ one lakh.

A consortium of 7 IITs led by IIT Kanpur, involving more than 100 faculty members from various institutions and organizations has been formed for working on the **Ganga River Basin Management Plan.** The project is being funded by MOEF at a cost of ₹ 16 crore. Interdisciplinary thematic groups covering a broad range of issues such as environmental quality and pollution, water resources management, fluvial geomorphology, ecology and biodiversity, socio-cultural and socio-economic factors, policy, law and governance, geo-spatial data and communication have been formed to execute the project.

I am pleased to inform you that **Boeing Company, USA** in appreciation of our research output in the area of RFID and Condition Based Monitoring (CBM) has decided to continue its support for the fifth consecutive year. In the area of RFID, we have been working on the design of innovative reader antennas for portable RFID reader. The primary objective here is to make the antenna as sleek and compact as possible. CBM for air compressors and motors allows the maintenance activity to be scheduled efficiently.

Our **Samtel Centre for Display Technologies** is exploring possibilities of commercial applications of Organic Solar Cells (OSC) with its industrial partners Tata Steels and OSC sub-

modules with MoserBaer. In the area of solid state lighting with organic light emitting diodes, the center has developed new technologies for better extraction of light from the device which is a key issue in this technology. In the area of printable electronics, the centre has developed a method of printing micron size width of nano gold ink.

IIT Kanpur has embraced a multidisciplinary approach to strengthen ongoing research on new and challenging areas of solar energy development. Towards this end, the Institute has set up a **Solar Energy Research Enclave (SERE)** with the objective of developing a solar photovoltaic technology demonstrator with various modular components and associated laboratories. SERE is receiving widespread external funding and has brought together faculty members from several departments of the institute.

I am happy to inform you that while presenting the Railway budget of 2011-12, the Minister for Railways announced that "success of the pilot project of **SIMRAN**, jointly developed by IIT Kanpur and RDSO, a Real Time Train Information System (RTIS) will provide reliable information on train running." SIMRAN is expected to contribute directly to the

modernization of Indian Railways by benefiting passengers and improving the efficiency of the system.

The next green revolution is sure to be driven by knowledge, especially with the challenge of climate change looming ahead. IIT Kanpur has been working on ICT in agriculture with special emphasis on agriculture knowledge management. Some of the major innovations that have come up include: use of semantic web and social networking technologies in agriculture knowledge creation and dissemination, automatic tagging for meta-data population, re-usable learning objects management in agriculture and extension content delivery. These efforts are supported by National Agricultural Innovation Projects funded by ICAR.

A software developed during the past year is **LASViewer**. This is a **LiDAR** data display and analysis software aimed at providing multiple kinds of views including immersive view, measurement, points of interest and areas of interest sharing at a fast speed. A LiDAR simulator called **Limulator** which can generate data similar to actual LiDAR sensors for artificially created terrain and other features has also been developed. In the same area, capability for capturing, storing, displaying and analyzing 3D laser images has been developed using a secure proprietary .dli data format for DRDO.

The Ministry of New and Renewable Energy has sanctioned a grant of ₹ 6.6 crore for the **Design and Development of Organic Solar Cells Sub-modules.** The project proposes to build sub-modules with polymer based organic solar cells that will be useful for practical applications. The three- year project targets building a base-line process to manufacture small area organic solar cells of at least 5% power conversion efficiency (PCE) with a six months lifetime, followed by a 10 cm by 10 cm sized sub-module which will have a PCE of 4% and an estimated lifetime of 3 years.

IIT Kanpur is leading an NMEICT, MHRD funded **Enterprise Resource Planning** consortium mode project having a funding of ₹ 19.36 crore. The other consortium members are AMU Aligarh, AVV Kochi, DEI Agra, IGNOU Delhi, IIT Roorkee, JMI Delhi, NIT Hamirpur, and SMVDU Jammu. The project envisages designing, developing, implementing and maintaining software services to make them available for all the educational institutes of the country.

RESEARCH INFRASTRUCTURE DEVELOPMENT

The Institute strives to provide state-of-the-art equipment to its faculty, students and staff to facilitate cutting edge research in the frontier areas of science and technology.

Under the FIST scheme of DST and with additional support from the institute, the Department of Chemistry is procuring a time resolved resonance Raman spectrometer. This facility is available only at a few selected centers across the world. The upcoming facility promises to be unique in addressing the requisite laser wavelength tunability (215 nm – 1064 nm), anaerobic and cryostatic sample chamber, ultra-sensitive detectability and ultrashort time resolution (5 ns). The facility is likely to interest several other departments across the Institute for e.g., MSE, CHE, Physics and BSBE.

The Department of Electrical Engineering has received a grant of 490 lakh from the DST under its FIST scheme for procuring a Real-Time Simulator, Millimeter Wave Network Analyzer, Light wave measurement system, Optic-wave photonic EDF amplifier, Laser Driver and Fusion Splicer, Wireless Network Simulator and Research Platform, Shadow Hand and a Biomorphic Robotic Arm, Control Research Platforms and a Four Wheel Drive and Four Wheel Steer.

A new State-of-the-Art 372-node **High Performance Computing** cluster has been recently inaugurated at the Computer Centre. It has been sponsored by the Department of Science and Technology and is based on Intel Xeon Quadcore processors with a total of 2944 cores and high-speed Infiniband network with a peak performance of 34.5 TF. It has greatly facilitated high-end computational research in the Institute covering several areas of science and engineering. On the infrastructural side, a modern data centre with state-of-the-art precision air conditioning and fire safety features is being built in the central area of the Computer Centre.

The Department of Aerospace Engineering has established a new DST supported experimental laboratory for the design, development and testing of an autonomous mini helicopter.

To carry out advanced research on practical power and control system problems, the Department of Electrical Engineering is setting up a 6-rack Real Time Digital Simulation (RTDS) facility which is the biggest in Asian academic institutions. For setting up this facility, DST has sanctioned a funding of about ₹ 7.6 crore under its IRHPA scheme. The

facility can simulate the transient behavior of practical systems using a time step of upto two microseconds. Two major research activities planned are Synchrophasor Applications in Power Systems and Grid Integration of Wind Farm/Solar Photovoltaics using AC as well as DC microgrids.

During 2010-11, under its CARE scheme the Institute has procured the following facilities: X-Ray Fluorescence (XRF) spectrometer, laser-induced incandescence, dynamic high-resolution polarized inverted laser confocal fluorescence microscopy, Scanning Electron Microscope, a probe station for temperature and magnetic field dependent electrical measurements on thin films, devices and materials.

INTERNATIONAL ACADEMIC COLLABORATIONS

The Institute has entered into MoUs with the University of Missouri -Columbia, USA, Yale University, USA, University of Waterloo, Canada and ParisTech – Paris Institute of Science and Technology, Paris, France.

FINANCIAL RESOURCE MOBILIZATION

The Institute has had a satisfactory financial year during 2010-11. The total Grant-in-aid received during the financial year from MHRD, Govt. of India, under non-plan was ₹ 112.30

crore, under Normal Plan ₹ 51.78 crore and ₹ 50.00 crore under plan (OSC), respectively.

The financial year 2010-11 has been reasonably good for fund raising at IIT Kanpur. The Institute received ₹ 4.08 crore from 872 donations made by 772 donors (501 donors from India and 271 donors from abroad). The Institute proposes to introduce initiatives to draw the corporate world and well-placed alumni to donate to IIT Kanpur and also to increase the number of donors.

A total of 461 donors (297 donors from India and 164 donors from abroad) contributed ₹ 33.12 lakh under the Annual Gift Programme. Donations received under AGP have been utilized for providing travel support to the students and faculty for attending international conferences, cash award to students for publication of their research papers in reputed journals, travel support to international visiting faculty, filing of patents, students scholarships and other activities supporting and encouraging excellence in the Institute.

State Bank of India has given a donation of ₹ 50.00 lakh for establishing the State Bank Chair in the area of Environment and Energy at the Institute.

Mr Sudhir M. Mittal (BT/CHE/70) has made a donation for establishing *Dr Jag Mohan Garg Chair* at IIT Kanpur. Ministry of Earth Sciences (MoES) has donated ₹ 1.5 crore to establish *D.N. Wadia Chair* in the Institute. Ministry of Steel has committed to institute *Ministry of Steel Chair* in the area of 'Ferrous Metallurgy' and five scholarships to undergraduate students. Dr. D. S. Hur, CEO of GS Caltex has created two young faculty Research Fellowships to honor Mr. Jeet S Bindra (Ex-President Chevron Global and BT/ChE/1968), a distinguished alumnus of IIT Kanpur and another to honor Prof. Arakare Vasudev, former faculty member of IIT Kanpur and teacher of Mr. Jeet S Bindra. Microsoft Research Lab India Pvt. Ltd. has donated ₹ 3.60 lakh for *MSR India outstanding Young Faculty Award.*

Mr. Sanjay Pradhan (BT/ChE/1986) and Mr Pramath Sinha (BT/MME/1986) have announced creation of two chairs during the recently held Silver Jubilee Reunion of their batch.

The Institute has received a promise of donation for US$ 1.5 million from Rajiv Motwani Foundation for construction of the new CSE Building.

Several donors have instituted new scholarships during the financial year 2010-11. To mention only a few: Mr Manoj K

Singh (BT/ME/84) has instituted 'Saraswati Singh Scholarship'; Mr Santosh Mehra (BT/EE/66) has instituted 'Anita and Santosh Mehra Scholarship'; Mr Ravi S Bhagavatula (MScI/Phy/89) has instituted 'Bhagavatula Project Award'; Mr Chandra M Srivastava (BT/ChE/65) has instituted 'Behari lal and Nalini Srivastava Memorial Scholarship'; Prof. Sanjay Mittal (BT/AE/88) has instituted 'Dr. R K Singhal Memorial Scholarship'; Prof. Ashok Saxena (BT/ME/70) has instituted 'Shanti and Ram Kishore Sahai Saxena Memorial Scholarship'; Ms. Suarhaa Monika Banerjee (non-alum) has instituted 'Vimal Madaan Memorial Scholarship'; Prof. Brahma Deo (faculty, IITK) has instituted 'Steel Scholarship'; Mrs. Vidula S Jakatdar, mother of Priyadarshan Jakatdar, (BT/EE/79) has instituted 'S Y Jakatdar Memorial Scholarship'; Mr. R Balasubramanian ((BT/ME/89) has instituted 'Balasubramanian & Visalakshi Scholarship.

World Quant Foundation, USA has instituted two Scholarships of USD 1000 each for IITK students. The Foundation stands committed to offer these two scholarships every year. IIT London Chapter has instituted one *IIT London Chapter Scholarship* which will be given every year. Dr. Gopal Shankar Upadhyaya (Retired professor of IITK) has donated ₹ 2.00 Lakh for instituting 'Samsonov Memorial International Lecture Series' in the Department of Material Science & Engineering.

SURGE 2010 program was conducted during summer 2010 which saw student participation of 122 members from 115 Institutes, and faculty participation of 80 members from IIT Kanpur as mentors. These figures for 2010 are nearly twice as that of the previous year. The selection of student participants was very competitive as 1500 applications were received from various institutions in the country.

The Institute encourages research by providing travel support to students and faculty members, rewarding students for publishing research papers in high quality journals. Institute has provided travel support to 148 students for attending international conferences, and cash awards to 128 students for publication of their research papers in reputed ISI Web Journals during the financial year 2010-11.

The Institute recognizes outstanding faculty by providing chairs and fellowships, supporting registration of patents, awarding summer internships and supporting schools on campus. These activities are being supported by alumni donations.

The IIT Kanpur Golden Jubilee celebrations started in August 2009 have just been concluded. A number of events,

conferences, student/faculty/staff activities were organized during the Golden Jubilee year.

There exists an enormous potential for actively engaging our alumni. The challenge ahead of us is to sensitize all the segments of the institute about alumni engagement and fund raising. Without a supportive environment at the grassroots level within the Institute, it may be difficult at times for our alumni and well-wishers to reach out to us. The Institute needs to create a substantial demand for donor funds, for the alumni to respond enthusiastically.

STUDENTS' ACTIVITIES

IIT Kanpur continually strives to encourage an equitable balance between academics and extra-curricular activities among its students. Our vision 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 student body. To translate such a belief into reality, the Institute nurtures social, cultural and sporting activities pursued by the students' gymkhana and other student groups.

With contributions from more than 200 students over a period of three years, **Jugnu** nanosatellite is now in its final integration stage for its launch by ISRO's PSLV C-18 rocket, currently scheduled for July-August 2011. Weighing less than 3 Kg (10 cm x 10 cm x 32 cm in size) with most functionalities of microsatellite (~100 Kg) on a small platform, the payload of the satellite includes an indigenously designed camera for near IR remote sensing, a GPS receiver and MEMS based Inertial Measurement Unit. Jugnu will be launched from Satish Dhawan Space Centre (SHAR), Sriharikota.

This satellite mission was a unique learning experience and also a trend setter in the country. Many universities in the country have now started working on such nano satellite missions. This mission is also expected to help ISRO in their programmes by providing them a standard proven platform for testing newer technologies and thus helping in reducing cost, development and testing time.

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 relevant plays. Other

technically oriented student groups are engaged throughout the year in pursuing special interests like robotics, electronic aids, animation, aero-modeling, dance, fine arts, and astronomy to name only a few activities.

The overriding objective of the large-scale events of the Institute such as **Antaragni** (the cultural festival), **Techkriti** (the technical and entrepreneurship festival) and **Udghosh** (the sports festival) is to infuse a sense of richness and purpose in the lives of students. All these social, cultural and sporting activities play a crucial role in the transformation of a student into a complete human being. These festivals have seen vastly improved participation levels, both from within the Institute and also from students from other national and international institutions. The revenues generated for conducting these festivals saw an impressive growth last year, which is a tribute to the managerial and logistic skills of our students. During the year, several talks with eminent personalities like Retd. Ambassador Arundhati Ghose and other such luminaries were organized.

The Institute sports teams also participated in the Inter IIT Sports meet this year held at IIT Delhi. The Badminton men's team was successful is securing a Gold. The Institute team visited IIT Roorkee to participate in the sports festival; our

tennis & hockey teams won silver medals. The TT Team was successful in securing a Gold Medal at MNIT's Sports meet.

The Institute witnessed stiff inter- Hall competition in the form of **Galaxy, Takneek, Spectrum** and **Varchasva,** inter- Hall Cultural, Science & Technology, Films & Media and Sports championships respectively. Fresher Varchasva tournament also was organized to find some new talent from the incoming batch. The sole guiding principle behind organizing these championships is to provide the students of this campus, a much needed platform to compete and showcase their cultural and sports talents and to give them a reason and a motivation, strong enough, to come out of their rooms and participate in group activities.

Significantly, the students also engaged in an Energy Saving Competition amongst hostels through an Inter-Hall Competition called **Green Opus**. The results were astounding in that the students just by internal competition were able to markedly reduce the average energy consumption. Results from all the five Inter Hall Competitions were then used to identify the winner of the **Overall Championship Trophy**.

The Counselling Service is an active wing of our students. The activities include organizing the orientation programme for UG

as well as PG students; providing specific attention to students having academic, financial or personal problems; monitoring the progress of students who need special attention. It enjoys wide appreciation from both faculty and students alike.

After a two-year low, the economy bounced back and the Placement Office received a good response from the industry. This year we saw the presence on campus of many past recruiters who went low on recruitment for the last couple of years. There was also an overwhelming response from the Consultancy, FMCG and Core sectors and many new companies have been added to our list.

753 students registered for placements this year, of which 660 have job offers from 160 companies that took part in the placement process. Thus our overall placement record stands at 88%. The break-up is as follows: B.Tech 89%, Dual 96%, M.Tech including M.Des 81%, M.ScI 90%, M.Sc 2 yr 83%, and MBA 98%. We are still awaiting the outcome for some of the candidates who participated in the campus placement drive.

The relationship with alumni was further strengthened with Mr. Anurag Singh of 1986 batch presenting the SPO with a State- of-the-Art Portal to be used for the placement process.

Ms. Madhu Chadda from the 1979 batch along with her team conducted a 3-day workshop on personality and soft skills development.

The Career Counseling Program continued successfully with a significant rise in the number of students who availed this facility.

The Institute has put in place the entire infrastructure necessary to meet the requirements of the enhanced student strength. As of now, there are eleven halls of residence, nine for boys and two for girls. The total capacity in these halls is over five thousand.

CLOSING REMARKS

Dear graduates, on this occasion of the forty-third convocation, I congratulate each of you on your achievements. I extend my best wishes to Class of 2011 passing out today. I also take this opportunity to salute your parents for being with you and encouraging you to continually strive for excellence.

As individuals you will choose the profession that excites you, that generates intellectual passion within yourself, engages your mind in the best possible way. I fervently hope that you

would be successful in your endeavors. Today, you will be leaving the protected environment of this Institute to find your place in the larger order of the society. Prepare yourself to evaluate the needs of others and respond to the call for action.

Graduates, you have the responsibility of changing this world into a better place to live in. You are supremely qualified to bring about this transformation given your training, passion, knowledge, and determination. Innovate, create and forge ahead. As leaders, you should continually strive to usher in a revolution of quality in both professional and social domains. Always look for ways and means to help your countrymen. Discover your own mantra to create wealth for the benefit of the human society. With your personal standards of excellence, you are ready to evolve just policies that would leave no community or race behind. Simply put, if you cannot break the chain of poverty nobody else will be able to!

Dear Graduates of 2011, I admire you for your fine accomplishments during your stay at IIT Kanpur. Given your intellectual attainments and breadth of understanding, you are destined to bring cheer, hope, joy and luck in all the lives you touch. Each of you in your own way has internalized the spirit of IIT Kanpur that privileges commitment, excellence,

fellowship, and, importantly, service. No matter where you are and what your vicissitudes, continue to dream and dream big at that! Never forget that “in [your] dreams begin responsibilities.” Therefore, be a practical dreamer and see that in your lifetime you change this world a little bit. My sincere, good wishes for the productive work you aspire to do in the future.

Jai Hind.

Books

1. Numerical Methods for Engineering and Science. S. Guha and R. Srivastava (CE). Oxford University Press, New Delhi.
2. Dynamical Tunneling: Theory and Experiment. Srihari Keshavamurthy (CHM) and Peter Schlagheck, (Eds). CRC Press, Boca Raton USA, 2011.
3. Basic Electrical Engineering. S N Singh (EE). PHI Learning Pvt Ltd, India.
4. Vivade Vishade Pramade Prasave (a collection of short stories in Marathi). Prashant Bagad (HSS). Shabda publication, Mumbai, 2010.
5. Population and society. A. K. Sharma (HSS). Concept publishers, New Delhi, 2010.
6. Liberalizing research in Science and Technology: Studies in science policy. B. K. Pattnaik (HSS), Nadia Asheulova & Eduard Kolchinsky (Eds.). Russian Academy of Sciences, Saint Petersburg Politechnika, Russia 2010.
7. Services Marketing – People, Technology, Strategy – Sixth Edition. Christopher, L., Wirtz, J. and Chatetrjee, J (IME). Pearson, New Delhi.
8. Inter-fuel Substitution, Industrial Energy Demand and Carbon Emissions. Dr. Anoop Singh (IME), Kirit Parikh and Jyoti Parikh. VDM Verlag Publishers, Saarbrücken, 2010.

9. Powder Metallurgy: Science, Technology, and Materials. A. Upadhyaya and G. S. Upadhyaya (MSE). Universities Press Pvt. Ltd., CRC Press, 2011.
10. Carbon Nanotubes: Synthesis, Characterization and Applications. Kamal K. Kar (MSP). Research Publishing, Singapore.
11. Logic and Its Applications, 4th Indian Conference, ICLA 2011, Delhi, India, January 2011, Proceedings; Co-edited with A. Seth (CSE); Lecture Notes in Artificial Intelligence, Volume 6521, Springer-Verlag, Berlin, Mohua Banerjee (MATH).
12. IC Engines: Combustion and Emissions. Prof. B P Pundir (ME). Narosa Publishing House, New Delhi.
13. Stochastic Transport in Complex System. Debashish Chowdhury (PHY) coauthored with A Schadschneider (University of Koln, Germany) and K Nishinari (Univ. of Tokyo, Japan). ELSEVIER (Amsterdam, The Netherlands).

Fellowships

1. Professor Sanjay Mittal (AE) elected Fellow of the Indian National Science Academy.
2. Prof. Sandeep Verma (CHM) elected Fellow of the Indian Academy of Sciences, Bangalore.
3. Prof. A. Chandra (CHM) received the Ramanna Fellowship.

4. Prof. J. N. Moorthy (CHM) elected Fellow of Andhra Pradesh Academy of Sciences, Hyderabad.
5. Prof. Y. D. Vankar (CHM) received the J. C. Bose National fellowship.
6. Prof. V. K. Singh (CHM) elected Fellow of the Indian National Science Academy.
7. Prof. Ashutosh Sharma (CHE) elected Fellow of the Third World Academy of Sciences.
8. Prof. D. Kunzru (CHE) elected for G. M. Abhyankar Memorial Distinguished Fellowship in Chemical Engineering, by the Institute of Chemical Technology, Mumbai.
9. Prof. R. P. Chhabra (CHE) elected Fellow of the National Academy of Sciences, India.
10. Professor Kalyanmoy Deb (ME) elected Fellow of the Indian National Science Academy.
11. Professor G. Biswas (ME) currently Director, CMERI, Durgapur, received the J. C. Bose Fellowship.
12. Dr. A. Garg (MSE) received the Endeavour Research Fellowship Award (Australian Government), 2010-11.
13. Dr. Krishanu Biswas (MSE) selected for the BOYSCAST fellowship of the DST.
14. Prof. Debashish Chowdhury (PHY) elected Fellow of the Indian National Science Academy.

Awards

1. Dr. D. P. Mishra (AE) received the Samanta Chandra Sekhar award instituted by Orissa Bigyan Academy.
2. Dr. D. P. Mishra (AE) received the Vikas Prerak Award from Bharat Vikash Sangam.
3. Dr S. Ganesh (BSBE) received DAE-SRC Outstanding Research Investigator Award.
4. Prof. Sandeep Verma (CHM) received the Shanti Swarup Bhatnagar award for Chemical Sciences.
5. Prof. T. K. Chandrashekar (CHM), currently Director of NISER Bhubaneswar, was conferred the D. S. Kothari Gold Medal at the Indian Science Congress.
6. Prof. V. Chandrasekhar (CHM) selected for the Chemical Research Society of India Silver Medal in recognition of his extensive and outstanding contributions to research in Chemistry.
7. Prof. R. N. Mukherjee (CHM) selected for the Chemical Research Society of India Silver Medal in recognition of his extensive and outstanding contributions to research in Chemistry.
8. Prof. Ashutosh Sharma (CHE) received the Infosys Prize under Engineering and Computer Science category instituted by Infosys Science Foundation.

9. Prof. Ashutosh Sharma (CHE) received the MRSI Distinguished Lectureship Award instituted by the Materials Research Society of India.
10. Prof. Ashutosh Sharma (CHE) received the Kapitsa Gold Medal, Russian Academy of Natural Sciences, RANS.
11. Prof. Ashutosh Sharma (CHE) received the R. C. Mehrotra Memorial Life Time Achievement Award of the Indian Science Congress Association.
12. Professor Ashutosh Sharma (CHE) received The Syed Husain Zaheer Medal of the Indian National Science Academy (INSA).
13. Dr. Jayant Kumar Singh (CHE) received the Amar Dye-Chem Award.
14. Prof. P. K. Bhattacharya (CHE) selected for the Hiyoshi Think of Ecology Award of Hiyoshi Corporation, Japan.
15. Prof. Manindra Agrawal (CSE) awarded the Humboldt Research Award.
16. Prof. Manindra Agrawal (CSE) awarded the Third World Academy of Sciences Prize in Mathematics.
17. A company Geokno India Pvt. Ltd. incubated through SIIC, IIT Kanpur by Dr. Bharat Lohani (CE) was awarded the ISBA start up of the year in ICT category.
18. Dr. Priyanka Ghosh (CE) conferred the Outstanding Young Investigator Award by the International Association for

Computer Methods and Advances in Geomechanics (IACMAG).

19. Prof. G. Neelakantan (HSS) was felicitated in recognition of his significant research contributions to Contemporary American Literature at the International Seminar on Humanistic Language and Literature Teaching.
20. Prof. Suchitra Mathur (HSS) selected for the Gopal Das Bhandari Memorial Distinguished Teacher Award of IITK.
21. Late Prof. R. Balasubramaniam (MSE), late Prof. S. D. Joglekar (PHY), late Prof. V. N. Kulkarni (PHY), Dr. Amit Mitra (MATH) and Dr. S. S. K. Iyer (EE) were awarded the Distinguished Teacher Award (2010) of IITK.
22. Dr. Anindita Chakrabarti (HSS) received the Dr. M. N. Srinivas Memorial Prize awarded by the Indian Sociological Society.
23. Prof. N K Sharma and Manu Kanchan (IME) won the Best Paper Award, AGCETI 2010.
24. Prof. RRK Sharma (IME), judged Outstanding Management Researcher at AIMS-7 conference held at IIM Bangalore.
25. Prof. Sanjay G. Dhande (ME & CSE) awarded the Dewang Mehta Business School Award for his outstanding contributions to higher education in India.
26. Dr. S. Mahesh (ME) received the INAE Young Engineer Award.

27. Dr. Kantesh Balani (MSE) received the INAE Young Engineer Award.
28. Dr. Kantesh Balani (MSE) received the NASI Young Scientist Platinum Jubilee Award.
29. Dr. Kantesh Balani (MSE) received the Young Metallurgist of the Year award by Ministry of Steel, Government of India.
30. Dr. Bikramjit Basu (MSE) awarded the NASI-Scopus Young Scientist Award.
31. Dr. Bikramjit Basu (MSE) received the Best Metallurgist of the Year Award instituted by Ministry of Steel, Government of India.
32. Prof. Dipak Mazumdar (MSE) received the INAE Visvesvarya Chair Professorship, 2011.
33. Dr. K. Biswas (MSE) received the IEI Young Engineers Award of IE (India).
34. Dr. Vivek Verma (MSE) received the Shri Ram Arora Award.
35. Dr. Shalabh (MATH) selected for the Mahalanobis Memorial Medal.

Editorships

1. Dr. D. P. Mishra (AE), Member of the Editorial board of the Chinese Institute of Engineers, Published by Taylor & Francis.
2. Prof. R. N. Mukherjee (CHM), Member, Editorial Board of Inorganica Chimica Acta by Elsevier.
3. Prof. J. N. Moorthy (CHM), Member of the Editorial Board of New Journal of Chemistry.
4. Dr. Debabrata Goswami (CHM), Editor-in-chief of Spectroscopy and Dynamics, by Simplex Academic Publishers.
5. Dr. Debabrata Goswami (CHM), Member of the Editorial Board of Review of Scientific Instruments, by American Institute of Physics.
6. Prof. Mukesh Sharma (CE), Member of the Board of Associate Editors of Environmental Engineering Science by Mary Ann Liebert Inc., New Rochelle, NY.
7. Prof. Mukesh Sharma (CE), Member of the Editorial Board of the International Journal of Environmental Science and Engineering, David Publishing Company, Libertyville, Illinois, U.S.A.
8. Dr. Y. N Singh (EE), Member of the Editorial Board of ISRN Communications, Hindawi Publishing Corporation.
9. Prof. S. Qureshi (EE), Editor of STM Journal VLSI Design Tools and Technology.

10. Prof. G. Neelakantan (HSS), Member of the Editorial Board of Philip Roth studies published by Purdue University Press, USA.
11. Ms. Shatarupa Roy (HSS), Associate Editor of the current volume of Design Principles and Practices: An International Journal, University of Illinois Research Park, USA.
12. Prof. B. K. Pattnaik (HSS), Member of the Editorial Board of Bangladesh Sociological Studies: an International Bi-Annual journal.
13. Prof. D. Kundu (MATH), Member of the Editorial Board of Modern Applied Statistical Methods.
14. Prof. D. Kundu (MATH), Member of the Editorial Board of Statistics and Its Application.
15. Prof. D. Kundu (MATH), Member of the Editorial Board of Communications in Statistics – Theory and Methods.
16. Prof. D. Kundu (MATH), Member of the Editorial Board of Journal Communications in Statistics – Simulation and Computation.
17. Dr. Shalabh (MATH), Member of the Editorial Advisory Board of Proceedings of Indian Society of Mathematics and Mathematical Sciences.
18. Dr. Mohua Banerjee (MATH), Editorial Board of the journal Fuzzysetsand Systems.

19. Dr. Kantesh Balani (MSE), Editorial Board of Recent Patents on Materials Science (Bentham).
20. Dr. Kantesh Balani (MSE), Editorial Board of Recent Patents on Nanotechnology (Bentham).
21. Dr. Kantesh Balani (MSE), Associate Editor of Nanomaterials and Energy (ICE Publishing).
22. Dr. B. Basu (MSE), Associate editor, Biomaterials and Biodevices.
23. Dr. B. Basu (MSE), Member of the Editorial Board Materials Science and Engineering: C - Materials for Biological Applications (Elsevier Journal).
24. Dr. B. Basu (MSE), Member of the International Editorial Board of Indian Institute of Metals-University Press Series.
25. Dr. B. Basu (MSE), Associate Editor, Bioceramics Development and Applications; Ashdin Publishing, Belgium.
26. Dr. B. Basu (MSE), Member of the Editorial Board of Journal of Materials Engineering Innovation - IJMatEI, published by Inderscience Publishers, UK.
27. Dr. B. Basu (MSE), Member of the Editorial Board of International Journal of Biomaterials, published by Hindawi Publishing Corporation, USA.
28. Dr. Anish Upadhyaya (MSE), Member of the Editorial Board of Powder Metallurgy.

29. Dr. P. Venkitanarayanan (ME), Associate Editor of Experimental Mechanics (the official journal of the Society for Experimental Mechanics), published by Springer.
30. Dr. Avinash K Agarwal (ME), Associate Editor of International Journal of Vehicle Systems Modelling and Testing (IJVSMT) ISSN.
31. Dr. Shantanu Bhattacharya (ME), Associate Editor of the Nanotechnology and Nanoscience.
32. Dr. Gautam Biswas (ME), Member of the Editorial Board of the Indian Journal of Engineering & Materials Sciences (IJEMS).
33. Dr. V K Jain (ME), Associate Editor of the International Journal of Machining Science and Technology, published by Taylor and Francis.

Major projects sanctioned

- Applications of biofuel for aviation (DST);
- Experimental investigation of flow separation in proposed aura intake duct and its control (ADA);
- Development of computational aeroelasticity code for helicopter rotor loads and dynamic response analysis (HAL);
- Design and optimization of a bioartificial liver support using cryogel based bioreactor for treatment of acute liver failure (DBT);

- Structural and biochemical studies to understand the role of a unique GTPASE ENGA in ribosome biogenesis (DBT);
- Gastro-esophageal transport and reflux: a comprehensive analysis using an interdisciplinary approach (DBT);
- Discovery of novel modulators of neurotoxicity as potential therapeutic interventions (DAE);
- Unraveling the role of human non-coding satellite-III transcripts in cellular stress response (DBT);
- Measurement of aerosol and droplet microphysical models (BRNS);
- Preparation of GRBMP (MOEF);
- Paleoseismic & GPS studies for active fault mapping and slip rate estimation in NW-central Himalaya, India (JICA);
- Fabrication of arrays of nano-sized metal particles/1d nanostructured materials (DMSRDE);
- Targeted multifunctional polymer capsules: a versatile drug carrier and bioimaging agent (DBT);
- Coordination polymers of transition and lanthanide metals for heterogeneous catalysis, luminescence and magnetic studies (DST);
- Inorganic hybrid helicate and encapsulation assembly mimicking cell and DNA structure (DST);
- Speech based access for agriculture commodity prices in six Indian languages (MCIT);
- ERP-mission (MHRD);

- Synchronous live lecture delivery system-Brihaspatisync (MHRD);
- Setting up real time digital simulation facility for advance research in power and control (DST);
- Development of carbon nanotube coated backing structure/ bipolar plate for the PEM fuel cells: performance evaluation (STC);
- MEMS based health management system for automotive brake & steering sub-systems (ADA);
- Study of flow structures and associated acoustics in a weapon bay cavity using les (ADA);
- A study of the effects of wake passing on turbine blade film cooling (MOD);
- Advancing the efficiency and production potential of excitonic solar cells (APEX) (DST);
- Syndicate bank entrepreneurship research & education centre (Syndicate bank);
- Technology business incubator (DST);
- Passive matrix full color organic light emitting diode (OLED) display with commercial specifications (DST).