Director's Report

Honorable Chief Guests Dr. Johannes Georg Bednorz, Nobel Laureate (Physics, 1987), IBM Zurich, Switzerland and Dr. K. Radhakrishnan, Chairman ISRO, Prof. M Anandakrishnan, Honourable Chairman, Board of Governors of the Indian Institute of Technology, Kanpur, Prof. V. Rajaraman, Honorary Professor, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore, Dr. Arun Shourie, Journalist and author, Members of the Board of Governors, Members of the Academic Senate, all graduating students and their family members, 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-sixth convocation of the Indian Institute of Technology Kanpur.

Indian Institute of Technology (IIT), Kanpur, was established in 1959 as the fourth oldest among the chain of IITs created as epitome of engineering education in the country. Since inception, IIT Kanpur distinguished itself as the pioneer of science based engineering education in India, thanks to a decade-long fruitful collaboration with a consortium of US Universities (Caltech, MIT, University of California at Berkeley, etc.) under the Kanpur-Indo-American-Program (KIAP). In the last 54 years, IIT Kanpur has come a long way in serving engineering education. It has carved a niche for itself by pioneering computer science discipline in India, partnering with industry in developing several new technologies, generating most advanced knowledge in science and engineering, and above all, producing over 25,000 alumni who

have established themselves as leaders in their respective domains by their distinguished contributions to the society.

Academic Activities

The academic year closing in June 2014 has been momentous, and I consider it a privilege to review our activities pertaining to this period. I am very happy to share with you that 121 Ph.D students have graduated over the last academic year. The number of graduating students at the undergraduate level is 662 and that at the postgraduate level 611.

Creation of the Department of Earth Sciences

The Institute created a new Department of Earth Sciences on February 5, 2014 with a view to establishing interdisciplinary Earth Science teaching and research programs of contemporary relevance and to provide quality manpower for promoting sustainable development and resource for India's future generations. The Department of Earth Sciences at IIT Kanpur would focus on the study of the Earth, encompassing its evolution and internal dynamics, its surface processes, emphasizing natural and human-induced transformations of the terrestrial environment vis-a-vis sustainable development, in the context of the major challenge we face in terms of rapidly increasing population. Apart from modern teaching programmes that include BS-MS and M.Tech. in Earth Science, students will be trained for high quality research that will enable a thorough examination of the issues related to the Earth Sciences in the PhD programme.

Research & Development Overview

During the year, the Institute has witnessed significant growth in its Research and Development activities. The number of externally funded ongoing projects has reached 452 with a total sanctioned amount of Rs. 342 crore. During 2013-2014, the Institute got sanctions for 132 sponsored projects worth Rs. 81 crore and 97 consultancy projects of value Rs. 11 crore. Some of the major grants sanctioned by various agencies during the year include Ministry of Human Resource and Development (MHRD, Rs. 32 crore), Department of Science and Technology (DST, Rs. 14 crore), Science and Engineering Research Board (SERB, Rs. 12 crore), Board of Research in Nuclear Sciences (BRNS, Rs. 2 crore), and Department of BioTechnology (DBT, Rs. 3 crore). Some of the major industries which have funded projects include Bharat Heavy Electricals Ltd (BHEL), Unilever Industries Pvt Ltd, Larsen and Toubro (L&T), Gas Authority of India Ltd (GAIL), SAP Labs India Pvt Ltd, Whirlpool India Ltd, Samsung Electronics, Boeing Company and Intel Technology India Pvt Ltd. A list of major projects is given at the end of the report.

During the year, we filed 12 international patents and 52 national patents including 3 design patents. 6 patents were granted in the year. Our earnings from intellectual property are US$ 1,72,065. Twenty-seven companies are currently being incubated at SIDBI Innovation and Incubation Centre (SIIC) and 26 have graduated till date. SIIC has successfully incubated 8 Bio-Tech Companies with two more in the pipeline. A full-fledged Bio Incubator Centre is proposed to be launched in the month of August 2014 with generous funding under BIRAC scheme of DBT.

Motwani Ideation Accelerator established with the generous funding from the Motwani foundation is a soft facility under the umbrella of SIIC in the domain of embedded systems, platforms, algorithms and IT related ideas. It is housed in the 6th floor of Motwani building, IIT Kanpur and is proposed to be launched in the month of August 2014. Ms. Butool Abbas, promoter of Thinking Threads Design Pvt. Ltd, a company which graduated from IIT Kanpur in December 2013, was selected for the U.S Government's prestigious International Visitor Leadership Program (IVLP) to visit and network in USA focusing on women's entrepreneurship in May 2013. Mr. Sandip Patil, promoter of E-Spin Nanotech P Ltd, a company currently being incubated at IIT Kanpur, was awarded Rajeev Motwani Young Entrepreneurship Award for this year. While Patil was at the Silicon Valley in connection with the award, he was introduced to some of the most prolific entrepreneurs behind startups like twitter, Facebook, google, MAKE Magazine, Tesla etc.

Abrasive Flow Finishing machine was developed by the Department of Mechanical Engineering in collaboration with Central Manufacturing Technology Institute (CMTI) Bangalore. This machine can perform nano-level finishing along with deburring and radiusing. The Society of Automotive Engineers club, IIT Kanpur designed and fabricated first Formula Racing Car with active collaboration from the newly opened Tinkering Laboratory. The team participated in Formula SAE 2013 racing event in Italy.

Major projects sanctioned

Some of the major projects sanctioned in 2013-14 are briefly described below.

Wellcome Trust sponsored a project titled *Role of SPINK1 in Cancer Progression: Regulatory Mechanisms and Therapeutic Target Potential*. This project proposes to characterize the full spectrum of the PCa specific driver aberrations in a large cohort of Indian prostate cancer specimens with specific focus on estimating the prevalence of SPINK1 overexpression. Department of Biotechnology has funded a project titled *Diagnosis of Cancer using Fluorescence Lifetime Imaging*. This project deals with development and evaluation of an all-optical method using combined Fluorescence Lifetime Imaging (FLIM) and static autofluorescence spectroscopic measurement for the diagnosis of cancer.

A project titled *Paleo-Seismic and Paleo-Tsunami Investigations along South-Middle Andaman & Car Nicobar Islands towards Earthquake & Tsunami Hazard assessment of A&N Islands* has been funded by Indian National Center for Ocean Information Services to undertake earthquake and tsunami studies in Andaman and Nicobar islands.

SERB has funded a project titled *Investigations into Compositionally Modulated Magnetoelectric Gallium Ferrite for Sensor and Transducer applications*. It aims at exploring Gallium ferrite which is a known piezoelectric and ferromagnetic material. The eventual goal of the project is to develop high insulation gallium ferrite to enable sensor and actuator devices for a variety of applications. SERB also sanctioned a project titled *Biosensors for Multi-Analyte Disease Detection*. Early detection of cancer is needed for effective remedial measures. Measuring the concentration of disease biomarkers in the body fluids is one diagnostic route.

One path of making healthcare affordable is by developing low-cost portable disease diagnostic units. This project activity is the phase II of an earlier IRHPA funded project to develop a microfluidic based electrolyte-insulator-semiconductor biosensor. Here further answers to specific research questions will be sought and the resultant scientific learning will be utilized to develop an integrated unit.

A project on *the Development of an Acoustic Online Weld Quality Monitoring System* funded by DST is expected to work in an integral manner with the existing welding systems. It will be modular in form and will employ state-of-the-art sensors, embedded electronics and Neuro-Fuzzy based Diagnosis Algorithms to provide on-line assistance for improvement in welding operation.

A new project entitled *Advanced Centre for Computational Research and Education* has been started under the FAST program of MHRD for a period of five years. The Centre is meant to prepare quality manpower in the area of computational science and research and carry out high quality research. In addition, the Centre will have a visitors' program and organize short term courses. The new Centre involves researchers from different departments like aerospace, mechanical, chemical, biological sciences and engineering, chemistry, etc.

The *Knowledge Network Center on Floods and Waterlogging* at IIT Kanpur supported by UNDP and Australian Aid is aimed at facilitating interaction among the river scientists, field engineers and policy managers through consultative workshops for tackling real-life problems related to floods and

waterlogging. Efforts are made to reach out to several sections of the society as well as the government agencies and stakeholders through specially prepared materials that will increase the awareness about these issues and through consultation workshops and interactions. Few pilot projects have also been set up in north Bihar and Odisha as demonstration projects, which could eventually become success stories to be replicated by the government agencies.

The Office of the Principal Scientific Adviser to the Government of India has supported the *establishment of a Rural Technology Action Group (RuTAG)* at IIT Kanpur. The RuTAG team with the help of this sanctioned project has initiated work on appropriate technology deployment in a variety of rural activities including improved horseshoes, efficient food processing equipment, higher yield harvesters and operating agricultural appliances with sustainable solar power.

Three projects on Unmanned Air Vehicles started in 2013-14 with support from the Institute and Prabhu Goel Foundation. These projects involve (i) Design and Fabrication of Autonomous Flapping Wing Unmanned Air Vehicle for Surveillance and Aerial Photography, (ii) Development of Small Sized Fixed Wing Unmanned Aerial System, and (iii) Design and Development of Visually Guided Autonomous Quadrotors: Application in Surveillance and Disaster Management.

The Project *SandDHI: Scientific Study of Indian Knowledge Systems* funded by MHRD is envisaged as an interactive platform for displaying the finest intellectual achievements of the Indian mind in the field of science and technology as manifested in its material culture. The platform will thus mark the progress of the projects and also be in a constant stage of evolution as data is added, modified or deleted from its content. Therefore, unlike the traditional museums, content here is open-ended, improvisatory and evolutionary.

The National Facility for Archeological Studies of Heritage Structures: The objective of this MHRD funded project is to set up a National facility in the area of applications of science and technology in archaeology and Cultural Resources Management (CRM). The facility is expected to contribute in multidisciplinary areas such as promotion of cultural tourism; assistance in preservation and dissemination of cultural heritage by developing the CRM system; betterment of techniques for achieving, preservation and dissemination of Cultural heritage of India; paradigm shift in learning of archaeology sciences, development of resource material in

digital archaeology and capacity building in use of science and technology in Archaeology.

MHRD has also funded a project to set up a *Center for Mathematical Sciences (CMS)* at IIT Kanpur. The main aim of this centre is to create an eco-system that facilitates high quality national and international research programs and research collaborations in various domains that comprise Mathematical Sciences; to foster interdisciplinary research and knowledge transfer across the spectrum of Mathematical Sciences; to run an excellent visitors program that attracts and hosts the best researchers in Mathematical Sciences. We are confident that such a center will not only contribute to research in the mathematical sciences but also help in positioning IIT Kanpur as a globally recognized destination for young mathematicians and mathematically inclined engineers and scientists.

The Project titled *Building a Novel System for Soot: Measurement, Toxicity Assessment and Source Identification sponsored by MHRD aims* to build a system for ambient soot measurement. Other goals include toxicity assessment and source identification of soot. A unique component of this project consists in generating vast analytical data, which will also enable us to visualize, interpolate, and predict the BC and BrC concentrations in real time. Innovative prediction algorithms will be developed that will not only handle low-quality or missing data, but also operate in a synchronous fashion. The developed technology will be subjected to field test in selected pilot villages with partner organizations. The knowledge gained from the proposed interdisciplinary setup

will set the base for technological interventions in the near future.

Research Infrastructure

New HPC Facility: In 2013, the Institute significantly upgraded its HPC facility by procuring a high-end supercomputer (named HPC2013) which is currently ranked 130 in the global Top500 List, is 5th in India and is the fastest amongst educational institutions of India. It has a theoretical peak performance (RPeak) of 307.2 Terra-Flops. The HPC cluster consists of 8 management nodes, 781 compute nodes, 500TB storage and FDR infiniband interconnect.

Upgradation of the Tinkering Lab: It is a platform for all institute students to involve in hands-on activity in basic fabrication processes of mechanical / electrical / electronics elements. The laboratory provides the necessary platform for creative minds to come out of their `Think Space' to hands-on `Tinker Space' and transform their ideas into real-life

engineering objects, and eventually to products and patents. The lab was funded by the generous contributions of alumni from the 86 batch. The Tinkering lab with second round of funding from NSTEDB and equal contribution from IIT Kanpur has been able to procure high end machines such as Abrasive jet cutting machine, 3D reserve engineering system, Rapid injection moulding, Laser direct structuring machine with high grade polymer 3D printer and so on. This facility will become fully operational in September 2014.

New Facilities under the FIST Scheme: Department of Material Science and Engineering has been sanctioned a total grant of Rs. 5.55 crore under the FIST scheme of DST to procure the following facilities: Field Emission Scanning Electron Microscope with EDS, EBSD and WDS attachments (FE-SEM); High Resolution X-Ray Diffraction Facility (HR-XRD); Nanoindenter with Micro-scratching and Modulus mapping capability. These new facilities will greatly augment the research capability of the Department and the Institute.

New Facilities under the CARE Scheme: During the year, the following facilities were sanctioned under the CARE scheme of the Institute: Integrated Friction Force Microscope, Atomic Force Microscope and Nanoindenter; Optical Non-Contact Profilometer; MicroCal iTC200 System; High intensity Solar Simulator (50 sun) with Quantum efficiency Measurement capacity; Single Cylinder Optical Gasoline Direct Injection Engine (0.5L GDI); Micro Injection Moulding Machine with Twin Screw Extruder; Confocal Microscopy Based Optical Trap System with Force Measurement; High Frequency Laser for time-resolved particle image velocimetry (PIV) measurements; Surface Potential Microscope; High Performance Gas and Vapor Adsorption System for Characterization of Porosity and

Functional Utility of Metal-Organic Frameworks (MOFs); Energy Dispersive X-Ray Spectroscope (EDX); Deposition system for optical- quality dielectric multi-layers. In addition, many of the facilities which were sanctioned under the CARE scheme in 2012-13 became operational in 2013-14. A list of some of the other facilities established in the Institute during this year are listed at the end.

International Academic Collaborations

IIT Kanpur has entered into an agreement with the National University of Singapore (NUS) under which both Institutions have committed to offer Joint Ph.Ds to the students participating in the Joint Degree Programme(JDP). The Joint Degree Students would be registered with both NUS and IITK. They will be guided by the academic staff from both Institutions.

For promoting scientific and academic co-operation, the Institute has also entered into MoUs with the Rensselaer Polytechnic Institute, Texas A&M University, University of Tokyo, Deakins University, Australia, University of Kansas, Scientific Research Company “Carat”, Ukraine, Institut National Des Sciences Appliquees (INSA) Lyon, France. With these new MoUs, the total number of active MoUs with foreign academic institutions now stand at 42.

Institute Foundation Day

IIT Kanpur was registered as a society under the Societies Registration Act on November 2, 1959 in Delhi which paved the way for formally establishing the Institute in its present

location. To commemorate this defining event, the Institute Affairs Committee, in its meeting on 23 October 2013 resolved to celebrate every year the "Institute Foundation Day" on 'November 2.' The first such celebration was held on November 2, 2013. Prof. P. Balaram, Director, IISc Bangalore (and an alumnus of IIT Kanpur) graced the occasion as the Chief Guest and delivered the first Foundation Day lecture on "Evolution of Institutions: Learning From History."

Financial Resource Mobilization

The year 2013-14 has witnessed significant growth in financial resource of the institute. The total Grant-in-aid received during the financial year from MHRD, Govt. of India, was 145.86 crore (Non-plan) and 260.00 crore (Plan).

During 2013-14, the Institute received 4.74 crore from 699 donations made by 576 donors (352 donors from India and 224 donors from abroad). A total of 212 donors (98 donors

from India and 114 donors from abroad) contributed to total 312 donations of Rs. 38.65 lakh under the Annual Gift Programme. Donations received under AGP have been utilized for providing travel support to the students for attending international conferences, cash award for publication of their research papers in reputed journals, support to community services and other activities encouraging excellence in the Institute.

Hindustan Aeronautics Ltd., Lucknow has created a corpus of Rs 1 crore to institute a Faculty Chair at IIT Kanpur to work in advanced research and tackle multi-disciplinary problems in aircraft systems technology and its applications.

The Class of 1989 has contributed Rs 59, 64,694 during the FY 2013-14 on the occasion of its Silver Jubilee Reunion. The 1982 Batch has collected more than Rs. 7 lakh for instituting a lecture series at IIT Kanpur to be named as Ranjan Kumar Memorial Lecture on Entrepreneurship.

The batch mates of Late Mr. Ranjan Kumar (BTech/ME/1986) have instituted Ranjan Kumar Memorial Award in his memory. Dr. R.N. Mishra, father of late Dr. Prateek Mishra (BTech/EE/2006), has instituted Dr. Prateek Mishra Memorial Gold Medal. Bhagwan Das Sanghi Memorial Gold Medal has been instituted in memory of Late Shri Bhagwan Das Sanghi by his family members. Student Innovation Award has been instituted jointly by the National Award for Technology Business Incubators 2011 and IIT Kanpur. Mr. Rangarajan Vellamore R (BTech/ME/1990) has donated for instituting a faculty award for recognizing excellence in research among faculty of the Institute. The main purpose of the award is to

promote excellence in research leading to superior publications or findings or proof of concepts.

Several donors have instituted new scholarships during the financial year 2013-14. Mr. Piyush Keshri (BTech/EE/2009) has donated for Nirmala & Ashok Keshri Scholarship. Mr. Sandeep Agarwal (BTech/CHE/1988) has donated for Sandeep & Vinita Agarwal Scholarship. The Divine Life Society from Garhwal, Uttarakhand has donated for instituting four scholarships named Swami Sivananda Memorial Scholarship. Shri Ashok Kumar Goyal (BTech/ME/1972) has donated for instituting Srimati Bhagwati Rameshwar Goyal Scholarship. Bhagwan Das Sanghi Memorial Scholarship has been instituted by the family of Late Shri Bhagwan Das Sanghi in his memory.

SURGE 2013 program was conducted during summer 2013 which saw participation of 70 students from various Institutes across India and 63 faculty members from IIT Kanpur as mentors. The selection of student participants was very competitive as 1875 applications were received from various institutions across India which gives a clear indication of its increasing popularity.

The Institute encourages research by providing travel support to students and rewarding students for publishing research papers in high quality journals. Institute provided travel support of Rs 94.88 lakh to 175 students for attending international conferences, and cash awards of Rs 22.4 lakh to 171 students for publication of their research papers in reputed ISI Web of Science recognized Journals during the financial year 2013-14. Rs. 1.64 crore from endowment fund

account was reimbursed against New Faculty Fellowships during 2013-14.

The institute is working on an ambitious plan for raising substantial resources to increase the research and development activities on campus and hopes to launch some new initiatives in the year 2014-15.

Awards and Honors

Reporting about the awards and honors won by our faculty and students always remains a cherished moment for me as Director of this venerable institution. It gives me enormous sense of pride to share with you that Prof. V. K. Singh, Professor, Department of Chemistry and presently Director at IISER Bhopal has been conferred the Padma Shri by the Government of India.

Our faculty has played a significant role in pushing the frontiers of knowledge. This has been duly recognized in the form of various awards and honors, including fellowships of professional societies and editorships of international journals.

Prof. R P Chhabra, Department of Chemical Engineering, has been elected Fellow of the Indian National Science Academy. Prof. J. K. Bera, Department of Chemistry, has been elected Fellow of the Indian Academy of Sciences, Bangalore. Prof. V. K. Jain, Department of Mechanical Engineering, has been elected Fellow of Indian National Academy of Engineering, Delhi. Dr. Yogesh Singh Chauhan, Department of Electrical Engineering, received the IBM faculty award. Drs. Pankaj Wahi and Ishan Sharma, Department of Mechanical

Engineering, have been selected for the Young Engineer Award of Indian National Academy of Engineering. Dr. Kantesh Balani, Department of Materials Science and Engineering, received the IEI Young Engineers Award 2013-14 in Metallurgical and Materials Engineering conferred by The Institution of Engineers (India), Bangalore. Dr. Amit Kumar Agarwal, Department of Physics, has been awarded the NASI Platinum Jubilee Young Scientist award for 2013. Prof. Indranil Manna, Department of Materials Science and Engineering and the Director of the Institute, has been awarded the TWAS Prize in Engineering Sciences for the year 2013 by The World Academy of Sciences for the advancement of science in developing countries.

The many prestigious scholarships and awards received by our students have been a source of pride and pleasure for us. Vishal Gupta, Akash Goel, Anshul Kumar Rai, Shouvik Sachdeva, Arpit Shrivastava, Pranav Ravindra Maneriker, Priyangshu Goswami received the Aditya Birla Scholarship. Dhruv Singal, Samkit Tated, Vatshal Sharan, Krishna Chaitanya K, Prabhanshu Pavecha, Arpit Agarwal received the O.P. Jindal scholarship.

The full lists of awards to the faculty and students are given at the end of the report.

Students' Activities

IIT Kanpur continues its effort to encourage an equitable balance between academics and extracurricular activities among its students. Our vision is to create future leaders in

their field of interest 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 a firm belief in self-governance, Students' Gymkhana continues to provide a platform to all students to pursue their interest.

The Institute witnessed stiff inter- Hall competition in the form of *Galaxy, Takneek, Spectrum and Inferno***,** inter-Hall Cultural, Science & Technology, Films & Media and Sports championships respectively. Fresher Inferno tournament also was organized to find some new talents from the freshers' 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 were 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.

Inter IIT Sports Meet – 2013 (IIT Guwahati)

The IIT Kanpur contingent created history by winning the General Championship (GC) for the first time in 49 years. It was a splendid display of sportsmanship and the entire

contingent rallied around at the crucial hour ultimately leading to a glorious victory. The results are summarised as follows:

GOLD	SILVER	BRONZE
Athletics (Boys)	Badminton (Boys)	Tennis (Boys)
Athletics (Girls)	Hockey	Table Tennis (Girls)
Cricket	Squash	Swimming (Boys)
Volleyball (Girls)		Swimming (Girls)

Presidential Council

The Vivekananda Samiti organized many Community Collections Drive for Uttarakhand Fund Relief etc. The E-Cell in association with SIDBI and DOAA organized the first Entrepreneurial lecture of Ranjan Kumar Memorial lecture series. It has been also mentoring students who want to pursue a career in entrepreneurship. Prayas has diversified its activities significantly in the last year through undertaking English Teaching Workshop, sports competition, fine arts workshop etc.

Science and Technology Council

The Science and Technology council participated and won in many Inter-collegiate festivals: (i) Inter-IIT Tech Meet- IIT Kanpur bagged two 1st positions and one 2nd position out of the 3 events, (ii) SAE AERO Design East 2013 - IIT Kanpur despite its first-time performance bagged the 8th overall and 1st among all the Asian Countries, (iii) SAE- FSAE team went to FSAE, Italy and participated in the event, (iv) SAE AERO Design East 2014- IIT Kanpur participated in the international event, (v) ROBOCON- Team, IIT Kanpur received the award for 'Best Innovative Design, (vi) Teams from IIT Kanpur won many prizes in Techfest'14 (IIT Bombay) and Techkriti'13.

The S&T Council also organized various lectures and workshops in programming, robotics, aeromodelling etc.

Cultural Council

The clubs of the Cultural Council organized workshops, competitions and showcase of performances throughout the year. The Dance Club and Dramatics club were appreciated every time they participated in any Inter-College meet. Students from IIT Kanpur participated in a number of events which are as follows: (i) Dance Club won the 3rd prize in group dance and 2nd prize in street dance in Antaragni'13, (ii) Dance club reached semifinal and final of Meet the Streets and Kahani Thodi Filmy Hai, respectively, (iii) The Literary Society won various prizes in Antaragni'13, (iv) The Fine Arts Club won the 1st and 2nd prize in FA Marathon in Mood Indigo'13 (IIT Bombay), (v) Music Club won the 3rd prize in both Unplugged and Junoon in Antaragni'13.

Films and Media Council

The Films and Media council organized a large number of workshops in photography, designing, animation etc throughout the year. They also started Insight 360 - a video journalism show which releases a video once in two weeks. The walls of New SAC provide a display of the photographs taken by the Photography Club. The Films and Media Council has come a long way during the last year both in terms of activities and number of students participating in those events. They also organized Spectrum'14 annual film festival, screened over 40 movies covering many genres from international and Indian languages and invited prominent personalities from the film industry.

Games and Sports Council

The efforts of the Council are directed to ensure that each and every person enjoys the game no matter whether he/she is a part of the Institute team or not. There is a need to create an atmosphere where playing in the evening is an integral part of each person's schedule. The diverse activities organized during the year aims at broadening the outreach of sporting activities among various segments of campus community. The Council members believe that all unique activities introduced will bring in great value addition and foster connections with the many who have yet stayed away from the pre-existing sporting activities.

Some of the initiatives taken by the Games and Sports Council were: Formation of Boxing Hobby Group; Summer Camp (Week long trials + exclusive mess); Fencing Workshop; Duathlon; Institute Volleyball League; Formation of Joggers and Archery group; Skat-a-thon; Easy and free access to sports equipment; Wall Climbing as CPA; Shooting and

Weightlifting Room; Alumni Sports Meet; Extending the timings of Sports Facilities; Sports Shop; Tennis Court Refurbishment; Cricket Pitch Refurbishment; Basketball Court Refurbishment; Chess Online Portal.

Festivals

The overriding objective of 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.

Udghosh, Annual Sports Festival of IIT Kanpur, was organized during 26 -29 September 2013. The theme of Udghosh'13 was 'BREATHE.LIVE.PLAY,' in alignment with the spirit of the Olympic Games. Udghosh'13 in association with Games and Sports Council conducted a Duathlon on 28th August 2013 where about 200 people participated in the race and almost all of them managed to complete the race. Udghosh'13 witnessed a plethora of events from Motivational Talks, Gymnastic Shows and Sport Quizzes to various sports events like Athletics, Chess, Carrom, Cricket, Football, Hockey, Volleyball, Basketball, Badminton, Tennis, Table Tennis, Squash, Weightlifting and Kho-Kho. A Marathon was also organized on 29 September 2013 morning with the motto: "Fight AIDS: Be Aware, Take Care" which saw a participation of over 600 people.

Antaragni'13 was a sky full of stars. It started with a bang as IIT Kanpur's very own Indian Ocean took the crowd by storm

and it ended at a high note with Sonu Nigam's electrifying performance. But amidst this glitz and glamour, Antargni'13 stayed true to its purpose - to give the students of IIT Kanpur four memorable days and a platform to compete with the country's finest talents. Antaragni'13 made sincere attempts to showcase our rich Indian culture with Cultural Night, Indian Haat, ALI and Kavi Sameelan.

Continuing the legacy of 20 years, Techkriti'14 accounted for some new happenings. A National Aeromodelling Festival was conducted which comprised a workshop held in December as well as the Sky Sparks competition. Innovations in Manufacturing Practices was organized in association with Indian National Academy of Engineering(INAE). Uttarakhand Relief Camp campaign was organized during August'13 to help the affected persons in Uttarakhand. Techkriti, this year, also conducted a women empowerment campaign. A skill enhancement workshop for women was organized from 17 - 24 January 2014.

Students' Placement

Despite fear of a second recession, several companies actively participated in the Campus placement programme with many old recruiters registering their presence once again after the recession in 2007. Apart from an overwhelming response from the traditional Consulting, FMCG and the core engineering sectors, the e-commerce sector registered a sizable presence with a total of 30 job offers from companies such as Myntra, Flipkart and Snapdeal.

Around 1000 students registered for placements this year. Overall 78% of the registered students got placement through SPO. Amongst the various programmes, the Dual Degree had the highest percentage of placement at 98%, followed by M.Sc.(I) at 92%, MBA at 90%, B.Tech at 80% , M.Tech at 70%, M.Des at 62% and M.Sc. (2yr) at 49%.

Peer Review of the Institute

Pursuing excellence is never a sporadic event but demands a sustained and painstaking commitment with utmost devotion and courage. As advised by the IIT Council, IIT Kanpur undertook, first time in its history, an extensive Peer Review exercise comprising two complementary stages. The first stage, named Internal Peer Review, conducted during February 24 to April 04, 2014, consisted of academic review of each Department by a set of 5-6 experts drawn from academia, industry and R&D organizations from India and abroad. Each of these reviews lasted for two days and covered all relevant aspects such as teaching, course curriculum, laboratory and related infrastructure, faculty profile, student and staff feedback, research output and collaborations, internationalization and peer recognition. The expert committees submitted their appraisals and suggestions to the Director which were collated and shared with the Departments. Feedback from respective Departments along with suggested future course of action including corrective measures, was presented before the Board of Governors. The next stage of review, called External Peer Review, was conducted during April 14-16, 2014 by a seven member expert team chosen by the Chairman, IIT Council. The Expert

Team visited various Departments, Centres, facilities, Halls and other important locations, interacted with the faculty, staff and students and reviewed the overall progress of the Institute in teaching and research. The final report of the Committee is awaited which will be submitted to the Board of Governors and shared with the Senate. Since IIT Kanpur has always believed in an open, transparent and objective process of evaluation, we treat this exercise of Internal and External Peer Review as a rare opportunity to assess our strengths and weaknesses, determine our future goals and forge ahead in our pursuit of excellence with the requisite global benchmarking. Incidentally, IIT Kanpur was the first among the IITs to complete this momentous exercise.

Dear degree recipients, on this happy occasion of the forty-sixth convocation, I congratulate and commend each one of you on your achievements and extend my best wishes to the entire class of 2014 graduating today. I also take this opportunity to salute your proud parents for making you what you are today and encouraging you to continually strive for excellence. Now that you are ready to embark on a bigger voyage towards greater glory, I wish to share some of my own thoughts with you.

Life is a long walk of many miles and milestones. This coveted degree-scroll that you have earned today from a premier institute like IIT Kanpur should certainly count as one such important landmark in your life. However, let this be one among the many more to come and not the only one. We all fervently hope and pray that you will continue to thrive, conquer newer challenges and make us more proud in days to come. Do not falter, do not compromise and do not despair. Let courage, grit and determination fortify your zeal and

quest, let your profession and society at large prosper from your prosperity, and let your passion and conviction never ebb so that your dreams come to reality one day when others have retired and ceased to dream. In the words of Tagore: *The highest education is that which does not merely give us information but makes our life in harmony with all existence*. Let the time spent at IIT Kanpur make you one of those who will bring about a disruptive paradigm change to your domain and yet establish greater harmony in the society.

May God bless you with health, happiness and peace, may you prove yourself a worthy son or daughter of this great nation, may each one of you scale so high that we never tire of extolling you and to bask in your glory, and above all, may your unstinted effort turn victorious sooner rather than later!

Jai Hind!

Books Published

1. High Accuracy Computing Methods: Fluid Flows and Wave Phenomena, Tapan K Sengupta (AE), Cambridge University Press (2013).
2. Nanobiotechnology Vol. 10, Ashok Kumar (BSBE), Guest Ed., Studium Press LLC, USA (2014).
3. Single-Crystal-to-Single-Crystal Transformations in Metal-Organic Frameworks, S. Neogi, S. Sen, P. K. Bharadwaj (CHM) in Encyclopedia of Inorganic and Bioinorganic Chemistry (2014).
4. Translation and Postcolonialities: Transactions Across Languages and Cultures, Vijaya Guttal and Suchitra Mathur (HSS) (co-editors), Orient Blackswan, Delhi, India (2013).
5. Sociology of Science and Technology in India, B K Pattnaik (HSS), Sage India (2014).
6. Enterprise Resource Planning: A Managerial Perspective, Veena Bansal (IME), Pearson Education (2013).
7. Dropwise Condensation on Inclined Textured Surfaces, S. Khandekar S and K. Muralidhar (ME), Springer (2013).
8. Introduction to Micromachining (Second Edition), Edited by V.K. Jain (ME), Narosa Publishers, New Delhi (2014).

9. Engineering Materials in Mechanical Design: Principles of Selection with Q&A (Second Edition), Sujeet K. Sinha (ME), RPS Singapore, Singapore (2014).
10. Materials Science and Engineering, 2nd edition, G.S. Upadhyaya and Anish Upadhyaya (MSE), Viva Publication, New Delhi (2013).
11. A first course in Iron and steelmaking, Dipak Mazumdar (MSE), IIM- Orient Blackswan, Madras.
12. Electronic Structure of Materials, R. Prasad (PHY), CRC Press, CRC press, Taylor and Francis Group (2013).
13. Compact plasma and focused ion beams, Sudeep Bhattacharjee (PHY), CRC Press, Taylor and Francis Group, Boca Raton, Florida (2013).
14. Ceramic Nanocomposites, edited by Rajat Banerjee and Indranil Manna (MSE), Woodhead Publishing Limited (2013).
15. Laser Assisted Fabrication of Materials, edited by J. Dutta Majumdar and Indranil Manna (MSE), Springer (2013).

Fellowships

1. Prof. Balaji Prakash (BSBE) has been elected Fellow of National Academy of Sciences, India.
2. Prof. Ashok Kumar (BSBE) has been elected International Brainpool Fellow from Korean Science and Technology, Korea.
3. Dr. Bushra Ateeq (BSBE) has been elected for Ramanujan Fellowship Award by DST.
4. Prof. R P Chhabra (CHE) has been elected Fellow of Indian National Science Academy.
5. Dr. Raju Kumar Gupta (CHE) received Inspire Fellowship of DST.

6. Prof. P. K. Bharadwaj (CHM) has been elected Fellow of the Royal Society of Chemistry, UK.
7. Prof. J. K. Bera (CHM) has been elected Fellow of Indian Academy of Sciences, Bangalore.
8. Prof. J N Moorthy (CHM) has been elected Fellow of the Royal Society of Chemistry, UK.
9. Prof. S. Verma (CHM) has been elected Fellow of the Royal Society of Chemistry, UK.
10. Prof. Somenath Biswas (CSE) has been elected Fellow of National Academy of Sciences, India.
11. Dr. Priyanka Ghosh (CE) received Indo-US Research Fellowship 2013, Indo-US Science & Technology Forum (IUSSTF).
12. Prof. Avinash Kumar Agarwal (ME) has been elected Fellow of American Society of Mechanical Engineers.
13. Prof. V. K. Jain (ME) has been elected Fellow of Indian National Academy of Engineering, Delhi.
14. Prof. V. K. Jain (ME) received Fellowship of Global Institute of Science and Technology.
15. Dr. Sagar Chakraborty (PHY) received DST-Inspire Faculty Fellowship 2013.

Awards and Honors

1. Prof. R P Chhabra (CHE) has been awarded RPG Life Sciences Prof. M M Sharma medal and CHEMCON distinguished speaker award by the Indian Institute of Chemical Engineers.
2. Prof. Ashutosh Sharma (CHE) received Prof. C.N.R. Rao Bangalore INDIA NANO Science Award at Annual India Nano Conference.

3. Professor Vinod K Singh (CHM) has been awarded the Padma Shri (2014) by Government of India for his contributions to Science and Engineering.
4. Prof. P. K. Bharadwaj (CHM) received the Distinguished Alumnus Award of IIT Kharagpur.
5. Prof. J. N. Moorthy (CHM) received Dr. K. S. Krishnan Memorial Lecture Award.
6. Prof. S. Verma (CHM) received Ranbaxy Research Award in Pharmaceutical Sciences.
7. Dr. B. Sundararaju (CHM) received Thieme Journal Award for Promising Chemists.
8. Dr. Sabuj Kumar Kundu (CHM) has received the DST INSPIRE Faculty Award for 2013.
9. Prof. Rajat Moona (CSE) has been chosen for the 2010 VASVIK Award in the category of Information & Communications & Technology.
10. Dr S Rajesh (CE) has been selected for the IEI Young Engineers Award 2013-2014 in Civil Engineering discipline awarded by The Institution of Engineers (India).
11. Dr S K Mishra (CE) has been selected for the IEI Young Engineers Award 2013-2014 in Civil Engineering discipline awarded by The Institution of Engineers (India).
12. Professor Bharat Lohani (CE) has been chosen for the National Geo-Spatial Award for Excellence by Indian Society for Remote Sensing.
13. Dr. Priyanka Ghosh (CE) has been conferred National Award for Guiding Best M.Tech Thesis 2013 by Indian Society for Technical Education (ISTE).
14. Dr. Yogesh Singh Chauhan (EE) received the IBM faculty award.

15. Prof. S. C. Srivastava (EE) has been elected to the Governing Council of Indian National Academy of Engineering (INAE).
16. Prof. S. N. Singh (EE) has been awarded Dr P S Nigam Power Sector Award 2013 by IE(I), UP State Center.
17. Prof. S. N. Singh (EE) received 2013 IEEE Educational Activities Board Meritorious Achievement Award in Continuing Education by IEEE, USA.
18. Prof. S. N. Singh (EE) has been awarded 2013 IEEE R10 Educational Activities Board Award by R10, IEEE Singapore.
19. Prof. S. N. Singh (EE) received 2013 IEEE PES Chapter Outstanding Engineer Award, 2013 by IEEE USA.
20. Dr Sandeep Anand (EE) has been chosen for the INAE Innovative Student Project Award 2013.
21. Prof. RRK Sharma (IME) has been awarded Dr Manubhai M Shah Memorial Award by Indian Commerce Association.
22. Dr. Shalabh (MATH) has been awarded IISA Young Researcher Award by International Indian Statistical Association.
23. Dr. Manas Das, Prof. V.K. Jain and Prof. P.S. Ghoshdastidar (ME) received 2012 A. M. Strickland Prize by Manufacturing Industries Division of the Institution of Mechanical Engineers (IMechE), U.K.
24. Dr. Shantanu Bhattacharya (ME) has been awarded the Young Scientist Award 2013 of the Institute on Smart Structures and Systems.
25. Dr Pankaj Wahi (ME) has been selected for the Young Engineer Award of Indian National Academy of Engineering.

26. Dr. I. Sharma (ME) has been selected for the Young Engineer Award of Indian National Academy of Engineering.
27. Prof. Dipak Mazumdar (MSE) received Vasvik Industrial Research Award in Materials and Metallurgical Engineering by Vasvik Society, Mumbai.
28. Dr. Kantesh Balani (MSE) received IEI Young Engineers Award 2013-2014 in Metallurgical and Materials Engineering by The Institution of Engineers (India), Bangalore.
29. Dr. Amit Kumar Agarwal (PHY) has been awarded NASI Platinum Jubilee Young Scientist award, 2013.
30. Prof. Indranil Manna (MSE) has been appointed an independent Director in the Board of Coal India Limited by the Ministry of Coal for three years beginning February 2014.
31. Prof. Indranil Manna (MSE) has been appointed Vice-President of the Indian Institute of Metals for three years beginning July 2013.
32. Prof. Indranil Manna (MSE) has been awarded TWAS Prize in Engineering Sciences for the year 2013.

Editorships

1. Dr. Mainak Chaudhuri (CSE), Computer Architecture Letters, IEEE.
2. Dr. Raju Kumar Gupta (CHE), Editorial Board, Trends in Chemical Engineering, STM Journals.
3. Dr. Raju Kumar Gupta (CHE), Editorial Board, Journals of Surface and Hybrid Coating, STM Journals.
4. Dr. Raju Kumar Gupta (CHE), Editorial Board, Journal of Polymer and Composites, STM Journals.

5. Prof. Animangsu Ghatak (CHE), Member, Editorial Board, Journal of Adhesion Science and Technology, Taylor & Francis.
6. Dr. Tarun Gupta (CE), Editorial Board of The Scientific World Journal as part of the journal's Toxicology subject area.
7. Dr. Priyanka Ghosh (CE), Editorial Board Member, Journal of Geological Resource and Engineering, David Publishing Company, Illinois, USA.
8. Prof. Sandeep Verma (CHM), Editorial Advisory Board of Journal of Peptide Science, European Peptide Society and John Wiley & Sons.
9. Dr. Nishchal K Verma (EE), Associate Editor, Transactions of the Institute of Measurement and Control, SAGE Publisher.
10. Professor S N Singh (EE), Editorial Board of the Journal of Modern Power Systems and Clean Energy (MPCE) published by The State Grid Electric Power Research Institute (SGEPRI) of China for a period of three years.
11. Prof. Raghu Nandan Sengupta (IME), Associate Editor, Foundations of Computing and Decision Sciences, VERSITA Publishers.
12. Prof. Debasis Kundu (MATHS), Associate Editor, Communication in Statistics - Theory and Methods. Communication in Statistics- Simulations and Computations, Taylor and Francis.
13. Prof. Peeyush Chandra (MATHS), Editorial board member, Journal of Indian Mathematical Society.
14. Prof. Avinash Kumar Agarwal (ME), Associate Editor, Journal of Energy Resource Technology, Transactions of ASME, since September 2013, ASME.

15. Prof. V. K. Jain (ME), Associate Technical Editor, Journal of Engineering Manufacture, The Proceedings Institution of Mechanical Engineers (UK), SAGE.
16. Prof. V. K. Jain (ME), Editor-in-Chief, Int. J. Precision Technology (UK), Inderscience Publishers Pvt Ltd (UK).
17. Prof. Bishakh Bhattacharya (ME), Member of Editorial Board, Journal of Low Frequency Noise, Vibration and Active Control published by Multi-Science, UK.
18. Prof. Anish Upadhyaya (MSE), Bulletin of Materials Science, Indian Academy of Science-Springer.
19. Prof. Anish Upadhyaya (MSE), Powder Metallurgy, Maney Pub., UK.
20. Prof. Dipak Mazumdar (MSE), Editor, Trans IIM, Springer.
21. Dr. Kantesh Balani (MSE), Editor, Indian Journal of Materials Science, Hindawi.
22. Dr. Kallol Mondal (MSE), Member, Journal of Materials Science & Surface Engineering.
23. Prof. R K Thareja (PHY), Associate Editor, Optics and Lasers in Engineering 2014-16, Elsevier Journal.
24. Prof. R. Vijaya (PHY), Associate Editor for the Special Section on Metamaterials and Photonic Nanostructures in Journal of Nanophotonics (published by SPIE), Vol.8, 2014.
25. Prof. S A Ramakrishna (PHY), Commission D (Photonics and electronics) member of the Indian National Committee of URSI (INCURSI) and the Commission D member from India to the URSI.
26. Prof. Indranil Manna (MSE) has been elected a Fellow of the Asia Pacific Academy of Materials in October 2013.

Students' Awards

1. Students of IIT Kanpur bagged the first prize in 'International Robots got Talent' – Techkriti 2013 for performance of a flying MAV with music and first prize in 'Eagle'-Techkriti 2013 for designing a flapping MAV (AE).
2. Students of IIT Kanpur bagged the first prize in 'ASME SDE' – Student design competition of Kshitij-13 at IIT Kharagpur (AE).
3. Students of IIT Kanpur bagged the Third prize in 'Laws of Motion' – RC flying event of Kshitij-13 at IIT Kharagpur (AE).
4. Binapani Mahaling (BSBE) has been awarded the Young Scientist Award for the year 2014 by the Indian Science Congress Association.
5. Dr Anjali Bajpai, (BSBE) a postdoctoral fellow, was awarded the Wellcome Trust-DBT Early Career Fellowship of the Welcome trust-DBT India Alliance.
6. K. Ray, S. Sengupta (CHE) received poster award for *Catalytic activity of alumina supported Ni-based bimetallic catalysts*, at the Materials for Energy 2013 conference (ENMAT II), Karlsruhe, Germany.
7. Ashutosh Rawat, (CHE) won the Best Research Paper Award at 4th International Conference on Chemical Engineering and Applications (CCEA 2013) held in Paris, France.
8. A. Shahin (CHE) received Innovative Student Projects Award 2013 (Ph.D.) by Indian National Academy of Engineering.
9. R. Chapyala, N. Kumar, S. Kumar, B. Prakash (CHE) received Gandhian Young Technological Innovation Award 2014.

10. M.Tech thesis of M Shaji (EE), has been selected for the Gandhian Young Technological Innovation Award/ Appreciation 2014.
11. The paper by S Bhattacharya (EE) received the best paper award in the IET Conference Kolkata.
12. The paper by Raju Ranjan (EE) won the best paper award in the INDICON Conference at IIT Bombay.
13. Karan Nathwani (EE) has been selected for Raman-Charpak Fellowship for this year.
14. The paper by Shantanu Agnihotri, Audip Ghosh, Avirup Dasgupta, Sourabh Khandelwal (EE) on *A surface potential based model for GaN HEMTs* has received the *Gold Leaf Certificate* in the IEEE Asia-Pacific conference on postgraduate research in microelectronics and electronics (Prime Asia 2013).
15. The paper by Soumya Shubhra Nag, Ravindranath Adda, Olive Ray (EE) entitled *Current-Fed Switched Inverter Based Hybrid Topology for DC Nanogrid Application* has won the best paper award in the session in 39th Annual Conference of IEEE Industrial Electronics Society (IECON 2013).
16. The paper by Vipul Arora (EE) entitled *Semi-supervised Polyphonic Source Identification using PCLA based Graph Clustering* has won the best student paper award in 14th International Society for Music Information Retrieval Conference.
17. M Sidhardha (EE) received the POSOCO award 2014 for his thesis entitled *Controller Design and Dynamic Analysis of PV System*.
18. Ankush Sharma and Paramarshi Banerjee (EE) have won the first prize of student pavilion in Gridtech 2013 organized by Power Grid Corporation of India in

association with Ministry of Power for the project titled "Remote Monitoring and Control for Power System Network Using Mobile SCADA Application".

19. Abhishek Koneru (EE) taped out 128 x 128 ROM (16 kilo Bits) memory module using 180 nm technology available in VLSI/EDA Lab of IIT Kanpur. The design was sent for fabrication of Chip to Euro-practice.
20. Ananya Lahiri (MATH) received INSPIRE Faculty Fellowship 2013 by DST.
21. Surjeet Kour (MATH) received INSPIRE Faculty Fellowship 2013 by DST.
22. Doctoral thesis of Mauro Mameli (ME) titled *Pulsating Heat Pipes: Numerical Modeling and Experimental Assessment*, from University of Bergamo, Italy, was awarded the best doctoral thesis for the year 2013, by the Italian Thermodynamics Union.
23. Gandhian Young Technologist Award to Dr. Dhananjay Kumar Srivastava and Kewal Dharmashi (ME) for developing laser ignition technique.
24. K. S. Ramakrishna (MSE) received Prof. B.D. Upadhyaya Gold Medal for outstanding thesis in the area of Physical Metallurgy and Materials Processing.
25. Pradyut Sengupta (MSE) was awarded the prestigious *IIM Dr. AK Bose Gold Medal* for his M.Tech. thesis during Indian Institute of Metals' Annual Technical Meeting at IIT BHU, Varanasi.
26. Pradyut Sengupta (MSE) received *Bogineni Chenchu Raman Naidu* Gold Medal for securing the best CPI in the Materials Science and Engineering Department, IIT Kanpur, 2013.
27. A.P. Moon, A. Barman, C. Chattopadhyay, S.T. Anand, N. Balaji (MSE) received the best poster award for the

paper: *Corrosion and Erosion Characteristics of In-situ Ball Milled Atmospheric Plasma Sprayed Ni-Ti Coating on Mild Steel* at ADNAN 2013, Chennai.

28. Kishlay Mishra and Shikhar Misra (MSE) obtained the third best poster award in Metallix 2014 held at Kolkata, India for presenting the research work carried out in MSE302A course.
29. Gyanendra Kumar (PHY) received the Best Poster award in the 8th Conference on Nonlinear Systems and Dynamics (CNSD), held at IIT Indore for his poster on *Chaos under pump and loss modulation in Erbium doped fibre laser*.
30. Shail Pandey (PHY) received a poster award at the 28th National Symposium on Plasma Science and Technology (PLASMA - 2013) organized by the Plasma Science Society of India (PSSI) at Bhubaneswar.
31. Bahadur Singh (PHY) received the best paper prize in International E-Workshop on Computational Condensed Matter Physics and Materials Science (IWCCMP-2013) held at IIITM Gwalior.
32. Vishal Gupta, Akash Goel, Anshul Kumar Rai, Shouvik Sachdeva, Arpit Shrivastava, Pranav Ravindra Maneriker, Priyangshu Goswami received the Aditya Birla Scholarship.
33. Dhruv Singal, Samkit Tated, Vatshal Sharan, Krishna Chaitanya K, Prabhanshu Pavecha, Arpit Agarwal received the O.P. Jindal scholarship.
34. Priya Gautam has been awarded IIM Vidya Bharathi Prize.
35. Himanshu Panday, Aniket S. Patole, Shariq Khan, Mohammad Asif received the first award in 48 hour design challenge organized by the the Hindustan Unilever-CODE.
36. Bharat Sarkar, Yogendra Singh, Hemant Kumar Singh received the second award in 48 hour design challenge organized by the the Hindustan Unilever-CODE.

37. Abhishek Attal, Abhishek Kumar Shastry, Bhupendra Kastore, Khalid Badiuzzama received the third award in 48 hour design challenge organized by the the Hindustan Unilever-CODE.
38. Charul Agarwal, S. Ekta, Janta M.Borah, Sonika Gondval received appreciation award in 48 hour design challenge organized by the Hindustan Unilever-CODE.
39. Amit Rajput won the 1st prize for poster presentation in ACCC4 International conference held in Jeju, South Korea.
40. Vipula Arora has received the best student paper award for Semi-supervised Polyphonic Source Identification using PLCA based Graph Clustering, 14th International Society for Music Information Retrieval Conference, Brazil.
41. M. Manolata Devi (MSE) has been awarded the best poster prize in Materials Science section in recently concluded Annual Technical Meeting of Indian Institute of Metals (IIM), held at IIT BHU, Varanasi.
42. Vinay Patel won the best poster award at the International Conference on Advanced Nanomaterials & Nanotechnology held at Center for Nanotechnology, Indian Institute of Technology Guwahati.
43. Jyoti Ranjan Sahoo, Harshit Agarwal, Chandan Yadav, Pragya Kushwaha, Renaud Gillon, Sourabh Khandelwal (EE) have received the "Gold Leaf Certificate" in IEEE Asia-Pacific Conference on Postgraduate Research in Microelectronics & Electronics (Prime Asia 2013) held at GITAM University Visakhapatnam.
44. Saumik Bhattacharya has received the best paper award at the Second Michael Faraday IET India Summit 2013, organized by IET KOLKATA branch.

45. Abhijeet Swain (CE) has been conferred the National Award for Best M.Tech Thesis 2013 by Indian Society for Technical Education (ISTE).
46. Aswathy Viswambhran, has been selected as a Fulbright Scholar at the Department of Sociology, Indiana University.
47. Binapani Mahaling has been awarded the ISCA Young Scientist Award in Medical Sciences (including Physiology) in Indian Science Congress.
48. Mishtu Mukherjee has received Prof. N. N. Saha Best Poster Award in Annual Symposium of Indian Biophysical Society held at Saha Institute of Nuclear Physics, Kolkata.
49. Shanu Sharma and Syed Nadeem Akhtar had presented their work on the manual stair climbing wheelchair in the presence of Dr. A P J Abdul Kalam at IGNITE 2014 competition, organized by the National Innovation Foundation at IIM Ahmedabad.
50. Indramani Dadha and Pavan Kumar Nagar have been selected for this year's Gandhian Young Technological Innovation Awards.
51. Deepak Ojha has received the best poster award for his work "Ultrafast Vibrational Spectroscopy of Liquid Water from first principles" at DCCBS-2014 Symposium held at IIT Kanpur in February 2014.
52. Bikramjit Sharma has received the best poster award for his work "Probing the vibrational spectroscopic properties of
water in bulk and interfacial region by combined electronic structure-molecular dynamics method" at DCCBS-2014 Symposium held at IIT Kanpur in February 2014.
53. Deepak Ojha has received the best poster award for his work "Multidimensional Vibrational Echo Spectroscopy of

liquid water" at CTTC-2013 Symposium at BARC, Mumbai, in September 2013.

54. Shiv Singh has received the best poster award in Fuel Cells 2014 Science and Technology conference held at Amsterdam.
55. Shantanu Sharma, Lokesh sharma, Santosh Akoijam, Priyanka Bharti, Bhavna Rathore ,Virendra Patel, Sriram Palika, Salim have received the medals in *Inter University Taekwondo Championship* held at IIT Roorkee.
56. Shayak Bhattacharjee, has recently published a book entitled *The Electromagnetism of the Induction Motor*, based on his papers on the subject.

Major Projects Sanctioned

- Three Dimensional Simulation of Rotating Ribbed Duct (GTRE).
- Role of SPINK1 in Cancer Progression: Regulatory Mechanisms and Therapeutic Target Potential (WELLCOME TRUST).
- Knowledge Incubation for TEQIP-II (MHRD).
- Oxidation of Graphite and Protective Coatings: Multi Length Scale Abridgment (BRNS).
- Deciphering the BMP Signaling Network in Developing Bone: an Interdisciplinary Approach Combining Bioinformatic Data Mining Tools along with Molecular Genetic and Developmental Biology Strategies (DBT).
- Establishment of a Multidisciplinary Innovation Lab (Tinkering Lab) (DST).

- Metal Catalyzed Decarbonylative Coupling Reactions and their Applications to Organic Synthesis (SERB).
- RUSTOM-II Wind Tunnel Model Design, Fabrication & Testing (ADE).
- Diagnosis of Cancer using Fluorescence Lifetime Imaging (DBT).
- Translational Control of Maternal MRNAS in Germline Stem Cells (DBT).
- Paleo-Seismic and Paleo-Tsunami Investigations along South-Middle Andaman & Car Nicobar Islands towards Earthquake & Tsunami Hazard Assessment of A&N Islands (INCOIS).
- Metamaterials and Designer Plasmonic Structures for Controlling Emission and Absorption of Light (DST).
- Advanced Materials Processing and Characterization Facilities (DST).
- Unified Compact Model of Advanced CMOS Structures (Semiconductor Research Corporation).
- Development of an Acoustic Online Weld Quality Monitoring system (DST).
- Biosensors for Multi-Analyte Disease Detection (SERB).
- Development of Network Management System for National Knowledge Network (DST).

- Advanced Computational Research & Education (MHRD).
- Knowledge Network Centre on Floods and Waterlogging: Focus on Disaster Risk Reduction and Climate Change Adaptation (UNDP).
- Decision Support System to enhance safety of Railway Track Workers (DST).
- High Lift Aerodynamics Project-Year 5: Chine Vortex Study (BOEING).

- Enhancing the drying efficiency by modifying surface wetability and drying process (Whirlpool)
- Heterogeneous advanced cache and memory architectures for emerging applications and systems (Intel)
- Investigations into Compositionally Modulated Magnetoelectric Gallium Ferrite for Sensor and Transducer Applications (SERB).
- Development of Higher Conductive SC2O3-ZRO2 Based Electrolyte for Solid Oxide Fuel Cells (SERB).
- Ground Response Analysis of Soils from North India Considering Soil Strain (BRNS).
- SandHI: Scientific Study of Indian Knowledge Systems (MHRD).
- National Facility for Archeological Studies of Heritage Structures (MHRD).
- Building a Novel System for Soot: Measurement, Toxicity Assessment and Source Identification (MHRD).
- Center For Mathematical Sciences (CMS) at IIT Kanpur (MHRD).
- National Facility for Archeological Studies of Heritage Structures (MHRD).

Labs/Facilities Developed

- Establishment of multidisciplinary innovation lab (currently named as Tinkering Lab).
- Anechoic Acoustic Chamber (ME)
- A microcalorimeter model ITC200 (CHM).
- Femtosecond Transient Absorption Spectrometer (CHM)
- Large area nano/micro depth profiling by AFM (PHY)
- Facility for transgenesis of multiple model organisms (BSBE)

- Large scale centrifugation facility (BSBE)
- High Performance Computing facility at Computer Centre

Softwares Developed

- Structural Dynamic Analysis of General Configuration Rotor Blades for HAL (AE).
- Comprehensive Aeroelastic and Dynamic Response of Helicopters in General Manoeuvre for HAL (AE).
- Brihaspati General Accounting System, Brihaspati-3, BrihaspatiSync for MHRD (EE).
- Sensitive position finder for Boeing (EE).
- Android Application software for CBM for Boeing (EE).

Technologies Developed

- Analysis module for impact of Tejas aircraft on a 20-tonne arrester barrier for ADA (AE).
- 6-DOF flight simulation code to analyze dynamic stability characteristics of supersonic artillery rocket for ARDE (AE).
- A Scaled and working prototype of vertical tailless stealth aircraft for DRDO (AE).
- Design, Development & Testing of Deployable Flight Data Recording Unit for aircrafts (AE).
- Joint Development of an autonomous mini helicopter (Technology Demonstrator Vehicle) for HAL and DRDO (AE).
- Low Cost PIV system: An LED based PIV system for BARC (AE).
- Development of filtration device for the depletion of leukocytes from blood for HLL (BSBE).
- Methods for fabricating optical lenses (CHE).

- A non-contact method for measurement of strain profile at a location for ICMR (CHE).
- Low Loss Fast Electro-Optically tuned embedded ring modular or filter (EE).
- Email filtering mechanism with milter as M.Tech thesis for BARC (EE).
- Intelligent CBM on Android based Smart phones for Boeing (EE).
- Sensitive Position finder for Data Acquisition System for Boeing (EE).
- Future Image Frame Generator for DST (EE).
- MTBA: MATLAB Toolbox for Bi-clustering Analysis (EE).
- Phototherapy Machine for Treatment of Neo-Natal Jaundice (PHY).