भारतीय प्रौद्योगिकी संस्थान कानपुर
Indian Institute of Technology Kanpur

निदेशक प्रतिवेदन

Director's Report

५३वाँ दीक्षान्त समारोह
२२ अक्टूबर २०२०

53rd CONVOCATION
22 OCTOBER 2020

Director's Report

Honorable Dr Arvind Krishna,CEO IBM, Dr K Radhakrishnan,Honourable Chairman, Board of Governors of the Indian Institute of Technology Kanpur, Members of the Board of Governors, Members of the Academic Senate, all graduating students and their family members, members of faculty, alumni, staff and student community: I heartily welcome you all to the fifty-third convocation of the Indian Institute of Technology Kanpur. I would also like to congratulate the graduating students and their families on this joyous occasion.

ACADEMIC ACTIVITIES

The academic session 2019-20 has been an unprecedented one in every sense of the term. Despite the shadow of a global health crisis looming large over us, the academic session ending in June 2020 has been a truly rewarding one, and it is a privilege for me to recount some of our activities pertaining to this year.

It is a moment of pride for me to inform you that the total number PhD degrees being awarded at this Convocation is 239. The number is by far the highest in the history of our Institute. Last year, at the Fifty Second Convocation, the number of PhD degrees awarded was 208. It is noteworthy that enrolment in the PhD programme has increased substantially in the last five years going from 1426 in 2014-15 to 1942 in 2019-20. Number of PhD degrees awarded at Convocation 2015 was 136.

To encourage outstanding scholars to join the doctoral programme directly after their Bachelors, the Senate approved the provision for an additional Master's degree to be awarded

along with PhD, subject to the fulfillment of a defined set of academic requirements. I am delighted to inform you that 18 students are graduating in the second batch of MTech-PhD Joint Degree at this Convocation.
The details are as follows:

Degree	Number of Recipients
PhD	221
MTech-PhD (Joint Degree)	18
MTech	546
MBA	56
MDes	10
MS (by Research)	39
PGPEX-VLFM	39
MSc (5-yr)	01
MSc (2-yr)	135
Double Major	22
Dual Degree	181
MS-PD (MS part of the Dual Degree)	12
BTech	628
BS	100
Total	**2008**

In all, 2008 students are being awarded the degrees today. Total degrees being awarded at this Convocation, including the Dual and Joint Degrees, are 2207.

In keeping with the flexibility that IIT Kanpur academic programme is known for, 30 students are graduating with two Minors whereas 169 students are graduating with one Minor. You will be delighted to know that 02 of the graduating students are graduating with three Minors. In all, 235 Minors are being awarded.

Number of students completing one Minor : 169
Number of students completing two Minors : 30
Number of students completing three Minors : 2

In addition, by spending one additional year at the Institute, 181 undergraduate students are graduating with a Master's degree along with their Bachelor's while 22 of our undergraduate students are graduating with a Second Major. 18 of our postgraduate students are graduating with an additional Masters along with their PhD degree by doing additional credits.

Of the 931 students of the Bachelor's and Bachelor's-Master's Dual Degree programmes who are being awarded the degree today, 204 students are graduating with Distinction (CPI of 8.5 and above).

To keep pace with the evolving knowledge in science, technology and other areas, 06 new undergraduate courses and 46 new postgraduate courses were approved by the Senate from April 1, 2019 to March 31, 2020.

ACADEMIC INITIATIVES

The academic semester 2019-20-II was concluded under the shadow of a grave health crisis. Several proactive measures were undertaken to ensure that the disruption in the middle of the semester in March 2020 did not hamper the academic activities. In an unprecedented move, all the courses were moved online and the semester was concluded by the end of June. The transition to remote teaching is now complete in the ongoing semester 2020-21-I, with a home-grown platform for content delivery being deployed for running the courses. The effort is guided by the belief that it is our duty to reach the student to the last mile.

On the Anvil

Several academic initiatives that are likely to impart strength to our academic programmes in the long run are in the pipeline.

- **Cognitive Science**: The proposal to establish a department of Cognitive Science (currently an Interdisciplinary Programme) is on the anvil. Research in various areas of cognitive science has huge potential in informing the stakeholders in various arenas like education, defense services, human-computer interaction design, product design, mental health etc. Through this new department, we will be exploring pathways to collaborate with various industry partners, psychiatric clinics, and government agencies to take up problems from their fields and make our contribution to solving them.

- **e-Masters**: A proposal for e-Masters in specialized areas such as Data Structures, Financial Engineering, Telecom, Manufacturing and several others that are perceived as emerging areas or areas that are in acute need of retraining is being finalized. The programme is being proposed with a special emphasis on the continuing education of those already employed in the industry.

- **Department of Space and Astronomy**: The Institute is working on a proposal to start a Department of Space Science and Astronomy with a special emphasis on instrumentation, space exploration, and astronomical observations. The discipline of space science and astronomy is a multi-disciplinary field which draws expertise from all areas of science and engineering. We believe that at IIT

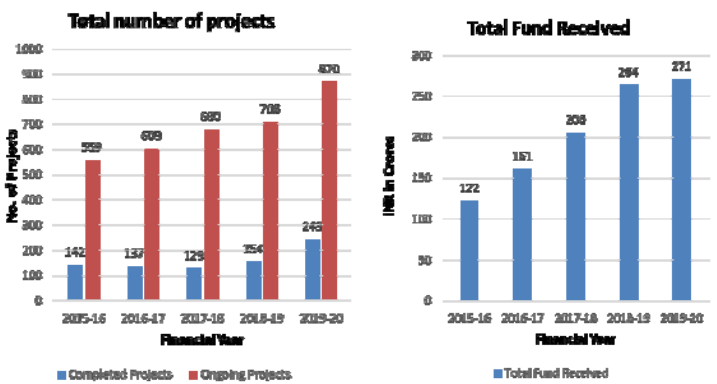
Kanpur, we are uniquely poised to harness the growing potential of this multidisciplinary field.

RESEARCH AND DEVELOPMENT

IIT Kanpur has registered steady growth in its research and development activities this year. Some of the highlights are mentioned below:

- 788 externally funded ongoing projects with a total sanctioned amount of Rs. 1065.99 crore.
- 200 sponsored projects got sanctioned during 2019 - 2020 worth Rs. 179.90 crore.
- 131 consultancy projects got sanctioned during 2019 - 2020 of Rs. 28.09 crore.
- During the year 2019-20, total funds received for sponsored projects are Rs. 222 Crore and the funds received for consultancy projects are Rs. 27 Crore.

Sponsored research: A summary



Leading Funding Agencies of the year:

Rs 56.65 crore	Rs 26.33 crore	Rs 20.40 crore	Rs 19.69 crore	Rs 12 Crore

Leading Funding Industry Partners of the year:

Major Projects Sanctioned

Some of the major projects sanctioned during 2019-20 are briefly described below:

National Centre of Excellence in Geodesy funded by Department of Science & Technology (DST): Geodesy is the science of measuring the size and shape of the earth including its gravity field and their temporal variations. The objective of the Centre is to nucleate and strengthen education, capacity building and R&D activities in Geodesy by imparting regular training programmes through various courses and by supporting masters and doctoral programs with fellowships to researchers working in Geodesy.
The Centre will act as a hub for extending laboratory and resource support for students and researchers from universities and institutions and advise state/central government departments on issues related to Geodesy.
The Centre will take up R&D projects in the entire spectrum of geodesy, viz., geoid modelling, height reference system, polar

motion, estimating total water storage and crustal deformation. The Centre will also establish a network of permanent GNSS stations including one IGS station along with automatic weather and meteorological sensors.

Rashtriya Avishkar Abhiyan (RAA) Labs for Samagra Shiksha Delhi sponsored by UEE Mission Education, Department Delhi Government: The Institute is setting up RAA labs in 136 government schools in Delhi. RAA Labs are based on Atal Tinkering labs of NITI Aayog and aim to leverage the potential for Science, Mathematics and Technology (SMT) learning in non-classroom settings. The Institute will be involved in assisting teachers in demonstrating experiments and conducting activities, content development (computer simulations, audio/visuals), and measuring the effectiveness of the program through national level competitions like NTSE and Children's Science Congress.

EMI/EMC and Electrical Safety Testing Facility funded by Biotechnology Industry Research Assistance Council (BIRAC): The project aims to establish a world class EMI/EMC (Electromagnetic Interference and Compatibility) test facility at IITK, where the major focus would be to test the EMC compliance of modern electronic instruments and gadgets presently used in the medical industry. The major challenge with the usage of digital electronic gadgets is the mitigation of the electromagnetic interference (EMI) as they continuously generate broadband undesired electromagnetic (EM) fields. It is more challenging for the electronic instruments used in the medical field because of the human health risk involved in addition to the compliance with the regulatory EMC standard. The EMI/EMC testing facility will have special emphasis on medical instruments starting from low frequency to RF range,

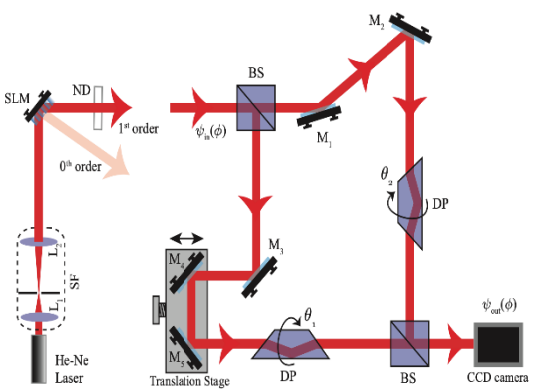
which would especially be quite helpful to start-ups developing new electronic and medical instruments. The proposed facility would conduct the electromagnetic interference and electrical safety tests as per IEC 60601, CISPR 11, and CISPR 16 standards.

At present, there are no certified EMI/EMC facilities to test electronic instrument in general and medical gadgets in particular in the northern, central and eastern part of India. The proposed facility would fill in this gap, and would eventually facilitate the growth of MedTech industry including startups in this part of the country. The medical institutes, public hospitals, private medical practitioners etc., especially in the surrounding region, would be encouraged to get all their biomedical instruments and electronic gadgets certified by the designated EMI/EMC Center at regular intervals. Additionally, the Center would conduct various workshops and short courses at regular intervals to create awareness about the significance of EMI/EMC issue among the medical professionals, the product designers as well as the academic community.

State-of-the-art Facility for Design and Fabrication of Medical Devices and Equipment with In-House Quality Control System for Cultivating a Local Production Hub of Medical Grade Technology and Solution Industry funded by BIRAC: As India progresses on her transformational journey towards global economic leadership, the biotechnology sector is recognized as one of the key contributing drivers. ‘MedTech IIT Kanpur’ would be a dedicated medical-grade product design and development center in this direction, which is being established while augmenting the existing facility, Imagineering Laboratory, at IIT Kanpur. The facility would cater to the medical devices

research requirements of around 30 crore population in North India. After the development of high fidelity physical prototypes, the fabrication of devices could be further incubated using the materials and processes intended to be used in batch or mass-scale production. It is intended to establish a cost-effective and efficient fabrication facility at IIT Kanpur which will benefit from utilizing the resources under industry-academia collaborative effort for increasing the indigenization of Bio-pharma and medical devices in India. The facility will focus on both manufacturing design and industrial design where factors such as ergonomics, aesthetics will be given importance along with functionality and manufacturability.

Developing Efficient Method for the Measurement And Characterization of High-Dimensional Quantum States for Photonic Quantum Information funded by DST: The high-dimensional quantum information protocols are extremely important as they offer several unique advantages compared to the traditional two-dimensional protocols based on polarization of photons. Among all the available high-dimensional bases, the orbital angular momentum (OAM) basis seems to hold a lot of promise. One of the main challenges in the implementation of any classical/quantum information protocol based on the high-

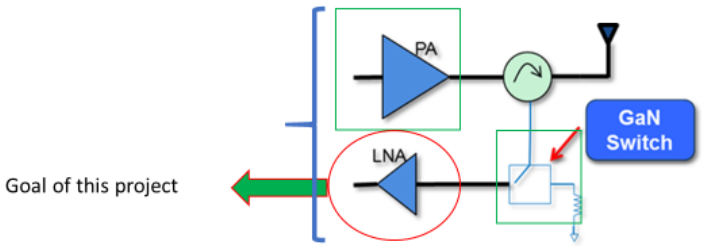


dimensional OAM basis of photons is the measurement of the state of an unknown light field in the OAM basis. The existing methods for measuring a state in the high-dimensional OAM basis suffer from either poor efficiency or strict interferometric stability requirements or too much loss. Accordingly, the first main objective of this proposal is to find efficient techniques by which high-dimensional quantum states can be prepared and measured with near-perfect fidelity. The second major challenge in exploiting the high-dimensional quantum state is the quantification of correlations in a high-dimensional quantum state. Even some of the available correlation witness and quantifiers are not easy to measure. So, as our second objective in this proposal, we will develop experimentally realizable techniques for characterizing the degree of quantum correlations in the high-dimensional quantum states. As our final objective, we will carry out proof-of-principal experimental demonstration of lab-scale high-dimensional quantum key distribution protocols in the OAM basis.

Elucidating the Conformational Dynamics Of Non-Canonical Seven-Transmembrane Receptor Activation And Signaling funded by Wellcome Trust, Department of Biotechnology (DBT): Our body encounters and responds to numerous types of challenges and stimulations every day. The cells in our body are surrounded by a membrane, which acts as a barrier and protects the interior of the cells from harmful factors (e.g. pathogenic organisms). Embedded in this membrane are certain protein molecules called "receptors" which receive the signal on the outside of the cells and transmit it to the inside in a highly regulated fashion. This allows the cells and our body to respond appropriately to external stimulation. Receptors are involved in pathological symptoms of a number of deadly human diseases such as

heart failure, hypertension and cancer. Interestingly, a number of medicines (drugs) that we take to treat various disease symptoms bind to these receptors and they work by either turning them "on" or "off". However, a number of these drugs also lead to undesired side effects in the body. Therefore, if we can directly visualize how these drugs bind to their target receptors, we will be better positioned to modify currently existing drugs and design new ones to treat human disease more efficiently. We aspire to embark on this long-term goal for a few selected receptors through this research proposal. In particular, we are trying to determine the atomic details of how these receptors bind to their ligands and activate downstream signaling pathways to elicit physiological responses by using cryogenic electron microscopy and X-ray crystallography approaches.

A GaN based High Power LNA for 5G Applications



5G RF Front End

Funded by INDO-US Science & Technology Forum (IUSSTF):5G is a key technology for mobile communication, IoT and automotive applications. 5G technology has two distinct frequency ranges – mm Wave (20+ GHz) for very short range and sub-6 GHz long range. The 5G implementation will deploy large number of small cells with MIMO, which will increase the data rate significantly in 5G, as compared to what is available in 4G. The goal of this project is to develop the low noise amplifier (LNA) using both GaAs and GaN technologies in collaboration with Tagore Tech. Although, GaN LNA has drawback of higher noise figure, but it has the advantage of integration on the wafer level with Tagore's GaN switch and PA, whereas GaAs LNA gives better NF, but it faces the challenge of integration at the die level. We will work on both the approaches to realize LNA according to required specifications. Our small cell front ends can be deployed in cities and villages, where the range needs to be higher, whereas existing technologies using SOI/GaAs could only be deployed in cities. Tagore will first commercialize LNA as a standalone product, which will be quicker to market, and then it will follow up with a front-end module for the 5G small cell.

Design of Flexible Sweat Sensors Snd Stretchable Batteries Embedded in E-Textile to Monitor Personal Health and Fitness Parameters funded by Indo-French Centre for the Promotion of Advanced Research (IFCPAR): The objective of this project is to design a scalable and flexible wearable system to predict the health and well-being of a user through sweat sensors. This activity involves the design of flexible sweat sensors to detect specific biomarkers, a processing module for analysis and communication, a stretchable battery to power the system and e-textile to embed these modules. A device prototype will be developed which can be subsequently scaled to various form-factors such as apparel, headband, armband etc. This is a collaborative Indo-French activity with one academic and one industry partner from each country. The academic partners are IIT Kanpur (India) and École des Mines de Saint-Étienne (France), and the industry partners are Samsung R&D India (India) and @Health (France).

Temperature-Sensitive Trp Ion Channels as Biological Thermometers to Gauge the Pain funded by DBT: Our abilities to sense temperature are closely linked to pain sensation because the same type of neurons is responsible for these two sensations. A subset of the TRP superfamily

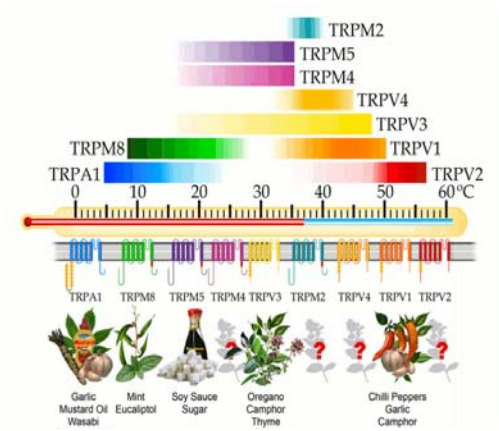
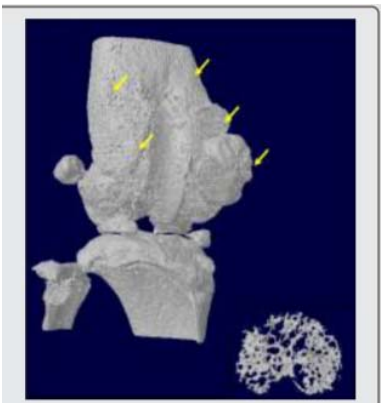


Figure 1. TRP channels as biological thermometer

of ion channel, called thermoTRPs, which are largely calcium-permeable ion channels, are expressed in the free nerve endings and mediate the pain and thermal sensation. There are 11 thermoTRP ion channels in mammals that together act as a biological thermometer to allow us to sense the whole range of physiological temperature ranging from noxious cold to noxious heat **(Figure 1)**. It is believed that these thermoTRPs have an intrinsic thermosensing domain that undergoes conformational changes in a temperature-dependent manner and allows the influx of calcium ions. However, the molecular identity of this thermosensing domain and mechanisms underlying the basis of the pain and temperature sensation by thermoTRPs remain enigmatic, limiting the design of novel analgesics drugs. To fill up this knowledge gap, we plan to study thermoTRPs and design new drugs for pain treatment. More specifically, we plan to determine the structure of thermoTRPs in temperature-activated state and identify the intrinsic thermosensing module that would greatly enhance our understanding of how these protein complexes undergo conformational changes to dictate the physical temperature perturbations into the biological process at the molecular level.

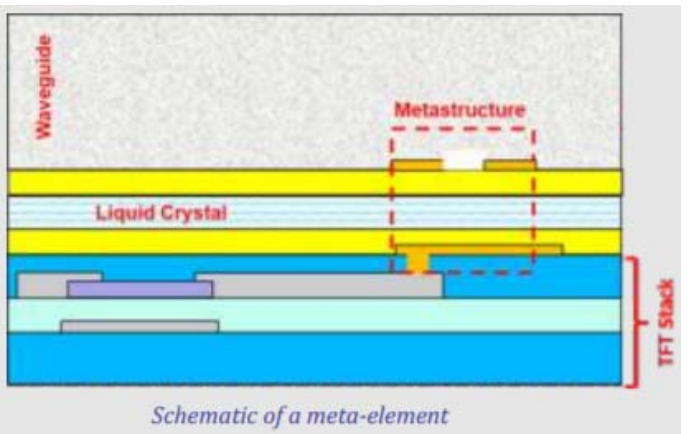
Deciphering the Role of Small RNAs in the Development of Hemophilic Arthropathy and Formulation of a MicroRNA based Therapeutic to Alleviate Joint Damage funded byScience & Engineering Research Board (SERB):Hemophilic arthropathy (Joint damage) due to repeated bleeds into the articular cavity is a major cause of morbidity in patients with hemophilia, a common genetic disorder, which affects 1on 5000 in the general population. On an average, these patients have 15 to 35 spontaneous joint and muscle bleeds per year. The current treatment is largely

based on prophylactic administration of the missing coagulation factor VIII (recombinant) protein, which is expensive and costs upwards of USD 100,000 per patient per year. Therefore, there is a need for newer and better strategies to prevent or delay the onset of blood-induced joint damage in these patients. Based on our preliminary studies, we reasoned that during these joint bleeds, microRNAs and its related processes play a significant role in the cartilage damage. A complete understanding of this process could not only pinpoint the mechanisms leading to cartilage damage but also reveal biomarkers of the disease and/or targets for intervention. Based on these findings, the project proposes to develop novel gene therapy strategies for this condition in a murine model of hemophilia.



Joint damage due to repeated bleeds in a Factor VIII deficient mice model of hemophilia. Micro-computed tomography and 3D rendering demonstrates calcification around distal femur (arrow) and reduced trabeculae in proximal tibia (inset).

Development of TFT Array and Liquid Crystal Layer and their Integration with Metasurface Antenna funded by Space Applications Centre, Indian Space Research Organization(SAC-ISRO): National Centre for Flexible Electronics at IIT Kanpur (FlexE Centre) is developing various enabler technologies in the field of large area flexible and printed electronics. FlexE Centre has a running program on fabrication of thin film transistor (TFT) based circuits for large



Schematic of a meta-element

area electronics. SAC-ISRO, and FlexE Centre are jointly developing Ka-band reconfigurable metasurface antenna integrated with Liquid Crystals that can be tuned using TFT array. Development activities include fabrication of high performance TFT based array, identification and characterization of suitable Liquid Crystals having high dielectric anisotropy, fabrication of Liquid Crystal cells, and integration of metasurface antenna with Liquid Crystals and TFT array. TFT array would act as a backplane for addressing capacitors at switching speeds in milliseconds. Liquid Crystal capacitor will be formed between meta-elements and waveguide structures which will jointly form scattering elements of antenna. Tunable metasurface antenna would

enable to achieve electromagnetic (EM) beam steering in the desired angular range.

A list of major projects granted this year is given at the end of the Report.

A list of some of the other sophisticated facilities established in the Institute during this year is listed at the end of this report.

Collaborations through MoUs

The Institute signed an MoU with the *Bureau of Indian Standards (BIS)* for collaboration in standards education, standards based research and contributions to national & international standards.

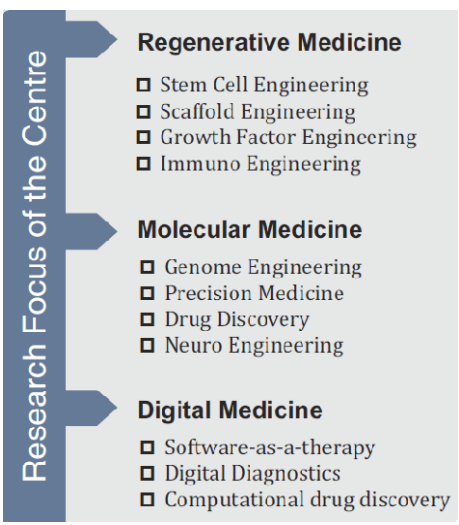
An MoU was signed with *UP Police* to do research on data analytics, AI, Drones and Surveillance technologies. This will help to address the problems of policing.

IIT Kanpur signed an MoU with *Prasar Bharti* for setting up a center of excellence in next generation broadcast and broadband. Other areas of collaboration include setting up AI Incubator, manpower training & capacity building and policy, regulation and standardization studies.

Centre for Engineering in Medicine

IIT Kanpur is poised to set up a 'Centre for Engineering in Medicine with the generous support from Mr. Rahul Mehta of Mehta Family Foundation. On the 61 foundation day of the institute, director Prof. Abhay Karandikar and Mr. Rahul Mehta signed a Memorandum of Understanding. Professor Shankar Subramaniam of the University of California, San Diego, is the first international advisor of the 'The Mehta Family Centre for Engineering in Medicine'. This would be the first centre of its kind in the country in terms of manpower it would train at the interface of engineering and medicine.

The vision of the centre is to generate significant impact in health care in India in terms of research/technology output in addition to the grooming of next generation leaders that are well trained in these interdisciplinary areas.



The centre would leverage the existing strengths within core engineering departments of IITK and department of Biological Sciences and Bioengineering (biomedical research) while

diversifying into new/frontier areas to enable more impactful research (fundamental and applied).

Simultaneously, IIT Kanpur also proposes to set-up a medical school in the institute. The long term plan is to have the presence of an engineering school, a medical school and a 'Centre for Engineering in Medicine' on the campus with the 'Centre' bridging between the faculty from Sciences, Engineering & Medicine to enable research at the interface of these areas.

Hon'ble Union Minister of Human Resource Development (MHRD) Shri. Ramesh Pokhriyal 'Nishank' visited IIT Kanpur

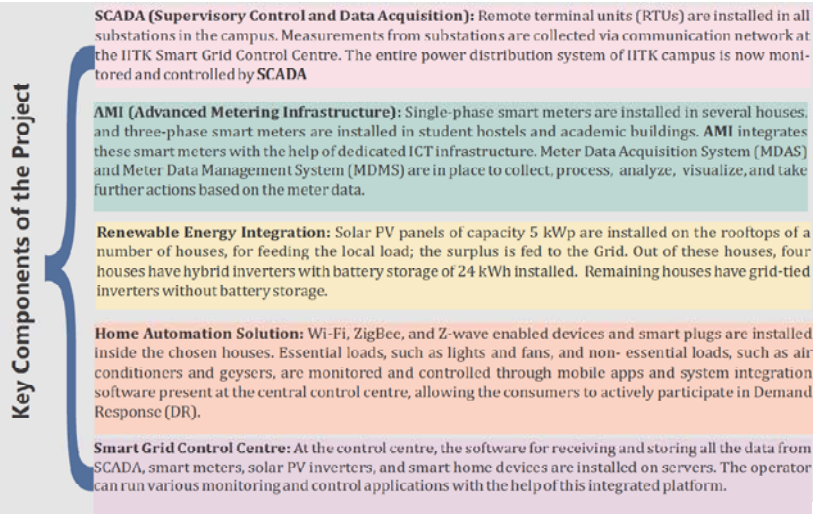
on November 02, 2019 as the Chief Guest for the Foundation Day of the Institute. During this visit, Shri Nishank and several

other dignitaries were present to witness the demonstration of ten selected incubated startups of the Startup Incubation and Innovation Centre (SIIC), IIT Kanpur. The selected startups for this showcase event were Earth Analytics, CD Space, Saptkrishi Scientific, Kritsnam Technologies, Phool, Offgrid Energy, Duosis, PhotoSpiMedex, Acquafront Infrastructure and Invoviron. The visitors appreciated that IITK incubator is supporting the deep-tech innovations solving the challenges of our country.

Smart City Project

A Smart Grid Control Centre set up was inaugurated by joint secretary, Ministry of Power, Mr. Mrityunjay Kumar Narayan along with Mr. A K Mishra, Director, National Smart Grid Mission (Project management unit) NSGM-NPMU, on February 24, 2020.

The centre has been set up as part of the smart grid pilot project jointly funded by the Ministry of Power (MoP) and IITK. This is one of the 14 Smart City pilot projects sanctioned by the Ministry of Power in 2014.



The main benefit is that the prototype will act as a testbed for smart-city related research, development, and training activities for industries, research institutes, and academicians in India. The key achievements/impact include implementing network reconfiguration, distribution system state estimation algorithm usable by typical Indian utilities, improvement in the overall power quality, reduction in the duration of outages by implementing fast restoration techniques, implementing demand response algorithms, savings on electricity bills for households with renewable solar PV and battery storage, improvement in overall customer DR participation and satisfaction, and the design of hybrid solar inverter suitable for the Indian condition.

Research and Innovation related to Covid 19

PIPES: PPE Kit

The PIPES (Polythelene-based Improvised Protective Equipment under Scarcity) Kit is designed based on thin

cylindrical rolls/pipes of Polyethylene which are non-porous and commonly used in the industry for packaging and making plastic-bags. Polythene material makes airtight enclosure for required protection. The design and the production process of the PIPES Kit is kept open-source through the website www.pipeskit.org, so that any small /medium-scale factory can start manufacturing them in large quantities. The manufacturing cost is envisaged to be less than Rs. 100. Cops of Agra have already started to use this low cost PIPES Kit.

UAVs for Surveillance

The drone will be used for surveillance of an area of radius up to 15 km. It has high-resolution camera with night vision capabilities. The endurance of these UAVs ranges from 1.5 to 10 hours. The team is working with the Kanpur city administration to help them in the day and night surveillance of the hotspots in the city.

Invasive Ventilator

Nocca Robotics Pvt Ltd, a start up at the Institute designed and developed a high-end yet affordable, indigenous ventilator necessary for providing life support to critically ill COVID19 patients under the overall supervision of the Institute.

Salient Features

Modular design, high end ventilator.

- Rapidly manufacturable at large scale across India.
- Low Power Pressure controlled (Version 1), Pressure and Volume Control (Version 2).
- Versatile operations: works with both medical air / ambient air + oxygen.
- IoT-based system to create a Ventilator Management System.
- Easy transition from invasive to non-invasive ventilation.

Bharat Dynamics Ltd, leading defence PSU under the Ministry of Defence, Govt. of India, has signed MoU with IIT Kanpur for the large scale production of the device.

Fake News Verification App

This is a user-friendly solution for fake-news detection on instant messaging & microblogging platforms. The app won the second prize in the MHRD AICTE SAMADHAN competition in response to COVID19. The Beta version of the app is ready and currently, it is being tested in a closed group.

Positive Pressure Respiratory System

The team has developed a working prototype of a Positive

Pressure Respirator System to addresses the problem of the acute global scarcity of N95 respirators. It provides uncontaminated air and isolates the health professionals from the exposure to the virus.

Salient Features

- Relies on positive pressure to stop entry of contaminated air.
- Universal (one size fits all) design.
- Fail safe and rugged design.
- Easy to follow production process.
- IoT-based system to create a Ventilator Management System.
- Easy transition from invasive to non-invasive ventilation.

Oxygen Concentrator

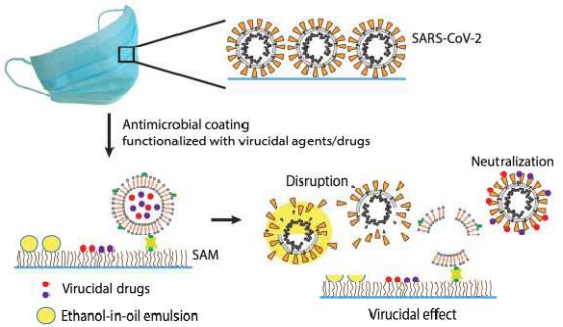
This economic, indigenous design will separate oxygen from the atmosphere to be used by a homemade respirator. Unlike an air filter/purifier (which only removes dust and bacteria), this device will selectively filter out oxygen from air which can then be compressed to serve acute respiratory problems. The advantage is that it will be no longer required to store and carry oxygen cylinders. The device is currently undergoing incubation for commercialization. It is in the testing stage in the Regency Hospital, Kanpur.

Reusable N95 and N99 Masks

These advanced reusable masks have three filters: a Nonwoven filter, a Coarse filter, a Nanofiber filter, and a supporting layer. The supporting layer can kill coronavirus as soon as it enters the mask filter. These masks will be equipped to eliminate the secondary source of contamination.

Preventive and Cost-effective Surface Coating sponsored by SERB: The objective of the project is to develop virucidal coatings for inanimate surfaces used in healthcare settings

such as surgical masks for the prevention of infectious diseases caused by highly contagious pathogens like SARS-CoV-2. The concept is based on a combination of antimicrobial polymer coating and functionalized virucidal drugs/agents to attain a synergistic anti-viral effect.



Chemical and Thermal Disinfecting System

The product combines two disinfection approaches to achieve a cost-effective & rapid disinfection process. The system utilizes two chambers, viz. atomization chamber and thermal shock chamber. Initially, the individual will be sprayed with disinfectant solution safe for external human use and this will be followed by exposure to thermal shock in a drying chamber. This two-stage process is aimed to achieve a high rate of personnel disin-

fection within 2 minutes.
The system is deployable at various facilities where safe access control is necessary. Currently the system is in use at five places inside the campus. Local hospitals & district administration have approached IITK to implement this system at different strategic locations in Kanpur.

Novel Electrostatic Sprayers

This electrostatically charged Air-assisted sprayer will result in better surface adhesion of the disinfectant. The quantity of disinfectant used can be limited. The expected rate of consumption of disinfectant solution is 10 ml/min. The nozzle is designed keeping in mind current manufacturing and assembly constraints. The system can be used to disinfect public spaces in an effective and efficient manner.

Solar-powered Natures Box Smart Bin system
Nature box is a Smart Bin system which ensures maximum hygiene and timely cleaning of the bins.

Salient Features

Image of a Under-construction piece for demonstration purpose only (not scaled)

- Inlet mouth of Natures Box has special coating that reduces the life of Corona Viruses on it by up to 95% as compared to its life on plastic or other bins.
- The systems are made up of steel with indigenous designs that prevents access to animals and thus ensuring zero possibility of pathogens and garbage getting littered outside the bins.
- The system has been indigenously developed by integrating an IoT module that provides fill level information of each bin on the map and informs about past cleaning of each bin, load on each bin and required frequency for cleaning of bins. This empowers the authority with tools to monitor and manage the timely cleaning of bins.

This also reduce the manpower and resource consumption in cleaning of bins by up to 80%.

Development of Alternative Mask Material

This low-cost protective face mask is equivalent to N95 face mask for the frontline medical staff and people. The team has tested various available filter media and developed the low-cost protective respirator. A filter testing rig equipped with an aerosol laser spectrometer will be set up with identification of non-woven polypropylene based 3-4 layer material for making such mask.

Vaccine against the COVID-19

The objective is to create a live attenuated and replication-competent virus vaccines against Novel Tcoronavirus (SARS-CoV-2) based on attenuated recombinant vesicular stomatitis virus (rVSV) vectors expressing the novel corona virus spike (s) glycoprotein (rVSV-SARS-CoV- 2S). Simultaneously, it is also being aimed for the candidate antivirals, which has potential to stop the viral infection. For this purpose, the team has designed a cell based in-vitro infectivity assay for screening potential antiviral therapeutics.

Modelling & Forecasting of COVID-19

The project aims for Modelling and Forecasting of COVID19 pandemic. After analyzing the real-time Tinfection data of COVID-19 epidemic for nine nations, the researchers have identified daily infection count and number of infected individuals as the key parameters. It is envisaged that the long-term community transmission may be inducing power law growth of the epidemic. The project is granted under SERB's Short-term MATRICS special call on Mathematical Modeling and Computations for COVID-19 Infections.

The project titled **Optimization of Lockdown, Testing & Isolating Strategies to contain COVID-19 in India** has been granted by SERB under its call on Mathematical Modeling and Computations (MATRICS) for COVID-19 Infections. The objective of the project is the optimization of strategies related to lockdown period, successful testing and isolating.

Innovation and Incubation

During the year, 65 patents including 13 design patents were filed, and 46 previously filed patents were granted, besides getting 2 technology licensed for commercialization. Amount received from licensed technologies during 2019-20 is Rs. 8.04 lakhs.

Till date, 655 IPRs have been filed, out of which 208 have been granted so far along with 110 technologies licensed for commercialization.

A total of 61 companies are currently incubated at Startup Innovation & Incubation Centre (SIIC), IIT Kanpur and 62 have graduated so far.

Notable recent achievements of the incubator are as follows:

- IIT Kanpur has been awarded the STEM Impact Award 2019, for engaging in Impactful Technology Transfer activities. The STEM Impact Award was handed over by Dr. Marc Stedam, President AUTM (AUTM is a leading association of Technology Transfer Professionals of USA).

➢ One of the Impactful technologies transferred by IIT Kanpur, is “DesKit - Convertible School Bag” (https://twitter.com/tiitkanpur/status/1180066767021854721) which was featured in the Compendium of Impactful technologies by STEM.

➢ IIT Kanpur participated in the IIA International Innovation Fair and won 5 Gold medals & 2 Silver medal in different categories. The details of awarded Patented technologies are as follows:

- Antibacterial Nanotechnology Based Nasal Air Filter for Breathing
- A Bionic Prosthetic Hand Device for Trans-Radial Amputee
- Electrosurgical Cautery with Suction Inbuilt
- A Phototherapy Unit for Treatment of Hyperbilirubinemea or Neo-natal Jaundice of Multiple Babies
- A Novel Integrated System for Gynecological Examination (DeeScope)
- An Integrated Hybrid Bio-Artificial Liver Bioreactor Design
- School Bag Convertible into Study Table

Notable recent achievements of a few Incubated Companies are as follows:

- *Kritsnam Technologies* was the winner of Smart Cities Technology Showcase and received LoI from New Delhi Municipal Council (NDMC) Winner of Pitch Session at Smart Cities India Expo 2019.
- *Saptkritshi* was selected at the Nepal Innovation Challenge (Agritech) by the UN Capital Development Fund.

- *CD Space Robotics* received appreciation from Amitabh Kant for first of its kind blood samples transportation using UAV with Tehri District Administration.
- *KrishiHub* was selected for sponsored participation at Facebook Developer Conference & Global Startup Summit Cofounder Jyotiska was selected for the prestigious Forbes 30 under 30 Asia list.
- Garv Toilets won in the 'Sustainable Cities' category of the Global Maker Challenge.
- *BioScan Research* was Semifinalist in the Lufthansa Runway Season 5.
- *HelpUsGreen*was appreciated by Sachin Tendulkar on World Environment Day initiative of DBS Bank.

SIIC organized its annual startup showcase event *'Abhivyakti ' 2019*. Over 35 selected incubated companies displayed their products. Endure Air, demonstrated the capabilities of their gasoline powered helicopter drone which can fly for 3.5 hours, 200 km, at a stretch. Another Drone company, CD Space Robotics, displayed their VTOL drone which delivered blood samples from a village in Uttarakhand to the district headquarter. Other major attractions were companies such as Saptkrishi, whose product Sabjkothi could keep green vegetables fresh at ambient temperature for up to 40 days; Invoviran, which has made compostable, water resistant plastic from Keratin available as waste material and Intignus, which has developed a novel method for detecting Preeclampsia, a pregnancy related complication associated with high pressure. More than 500 students from various schools and colleges of UP, prominent investors (Angel Investors and Venture Catalysts) and FICCI leadership were present in the event.

SIIC announced the launch of the *NTT DATA IITK Innovation Fellowship*. The event was graced by senior team member of NTT DATA which was led by IITK Alumni Dr. Harsh Vinayak who is currently Senior Vice-President, NTT DATA. Any recent graduate can apply for the fellowship program which offers a monthly stipend support upto INR 50,000 per month of a period of 12 months along with other support from SIIC.

Technopark@iitk

IIT Kanpur Research and Technology Park (Technopark@iitk) celebrated its first Foundation Day on March 2, 2020 on its successful completion of one year of its formal operations. The year was replete with local industry events, special interest group meets, visits by industry experts and many insightful interactions on industry-academia partnerships. The Chief Guest for the program was honourable NITI Aayog member Dr V.K. Saraswat. Dr Saraswat delivered a plenary talk titled 'Importance and way forward for industry-academia interactions' sharing his personal experiences on the nature of academia-industry interactions and how they have evolved over time. The seven companies currently housed in Technopark@iitk namely VTOL Aviation India, Injectoplast, Threads India, AR Thermosets, iSMRITI, Kanopy Techno Solutions and Dataman Solutions presented their work and the ongoing R&D collaborations with IITK. Besides, IITK Student-Industry engagement program titled ReWoP “IITK Students tackling Real World Problems' was once again launched and received an overwhelming response from industry and students. In this program, students will get a chance to work on real industry problems and industry will be benefited by out-of-the-box solutions as well as future workforce.

Technopark@IITK hosted a *Special Interest Group Meet on Artificial Intelligence (AI), Internet of Things (IoT) & Robotics* on November 09, 2019 at IIT Kanpur. The One-Day Meet provided an opportunity to eminent industry professionals & academia of IIT Kanpur to exchange views on current & future trends, applications & industry expectations in the fields of AI, IoT & Robotics. Industry leaders from Tech Mahindra, Analog Devices, GE Aviation, Microsoft, Wipro, Gaia Smart Cities and Boeing gave series of talks. IITK faculty talks highlighted their research in the areas of AI, IoT & Robotics. The Science and Technology Club comprising IITK students exhibited its innovations and products. The event provided an open platform and opportunity for fruitful discussions and collaborations between industry and academia for mutually beneficial long-term partnership.

Open House

As part of the Diamond Jubilee celebrations, the institute organized an “Open House” on January 25, 2020, in which over 3000 students from various schools visited IIT Kanpur campus to get a glimpse of our educational & research activities. The main goal of the Open House was to motivate senior school students towards science and technology careers. Stalls had been set up by media center, incubation center & different departments to show the students the various activities being undertaken at IITK. As part of this event, Vijnana Bharti (VIBHA) Brahmavart, in association with

IIT Kanpur and Stem Robo organized the InterState Science & Tinkering Fest (ISSTF) where students and startups showcased innovative science projects and products.

Science Day

On February 28, 2020, IIT Kanpur celebrated the National Science Day with a thematic workshop on Space Science designed to introduce recent exciting developments in this field to the IIT community. It provided a platform to the Space Science community within IIT Kanpur to share their research experiences and ideas. A Public lecture was organised on Space Science – the everlasting excitement by Prof. V. Koteswara Rao, Vikram Sarabhai Distinguished Professor, ISRO. The final event in the Science Day celebrations was a night sky viewing session organized by the Astronomy Club at the air strip.

A pseudo-dynamic test facility (PDTF) has been set up at IIT Kanpur with the generous support from DST. This state-of-the-art facility, the first of its kind in India, will be used for testing of prototype structures for evaluation of seismic performance.

INTERNATIONAL ACADEMIC COLLABORATIONS

In the last one year, our international collaborations have grown by leaps and bounds. In just 12 months, we have signed 11 MoUs with international universities from Japan, Taiwan, USA, Finland, Australia, Jordan, Russia, Scotland, across areas of academic & research collaboration, student exchange and joint degree programs. These MoUs include the ones with highly reputed universities such as La Trobe

University, National Chiao Tung University and William Marsh Rice University.

We have also signed a MoU with Tandon School of Engineering, New York University for a dual doctoral program for Computer Science Engineering and Electrical Engineering departments. With this partnership, we have yet another prestigious option for our students to be able to conduct world-class research under the guidance of faculty from both IITK and a reputed partner university.

Rice-IITK Collaborative Center

In January 2020, IIT Kanpur hosted a high-level delegation from Rice University for the inauguration of the Rice-IITK Collaborative Center, a one-of-its-kind center where a prominent US university has established a physical center at a leading Indian institute. Both Institutes are world leaders in the field of energy solutions and this Center will enable them to collaborate at a deeper level to find solutions to the world's pressing energy demand. The Center aims to conduct high impact collaborative research in the areas of Sustainable Energy, Materials, Water, Alternative Fuels and others. It is also envisaged that faculty from both Institutes will co-supervise graduate students for high-impact research in the aforementioned areas.

IITK-La Trobe Academy

Earlier this year, IIT Kanpur also signed an agreement with La Trobe University for the setting up of IITK-La Trobe Academy to boost both organizations' research capabilities and to create a globally recognized centre for research in health, food and water security, urban planning and transport.

IIT Kanpur has also partnered with La Trobe University for the Asian Smart Cities Research and Innovation Network (ASCRIN), a major research initiative to address the growing challenges of urbanization. The areas of research and industry collaboration include infrastructure and technology, economic development, mobility and transport, health and well-being, education, urban planning, governance and engagement, security and safety, culture and heritage, and energy, water and waste.

Government-Aided Programs

The Office of International Relations also manages the several government-funded programs for training and student fellowships. One recent program started by the Government of India is the ASEAN Fellowship which, in recognition of the deep and historical ties between Indian and ASEAN, offers students from these countries a chance to pursue their doctoral degree at one of the IITs with funding at par with their Indian counterparts. Out of the 16 applications received by IIT Kanpur, four students have been accepted for the PhD program under this scheme. In the coming admission rounds, we plan to scale up our outreach efforts and therefore expect the number of applicants to go up.

The Office of International Relations also organizes iTEC courses for professionals from developing countries. This year, before COVID19, the Office organized five courses with over 100 participants, providing them training in diverse areas such as communication and cyber security.

FINANCIAL RESOURCE MOBILIZATION

Out of the total amount of around Rs. 4000 Lakhs ($57.00 Lakhs @ Rs.70/$) pledged by donors in the last 12 Months, a total of Rs. 1915.00 Lakhs ($10.30 Lakhs) has been received this year as compared to Rs. 1406.00 lakhs last year and the balance is expected to be received based on the milestones achieved as set by the donor in the next one year.

Some Notable Contributions: (All Figures are in Lakhs)	**Pledged (Rs.)**	**Recd (Rs.)**	**Balance (Rs.)**	**Pledged ($)**	**Recd ($)**	**Balance ($)**
Mehta Foundation Endowment	1750.00	152.30	1597.70	25.00	2.00	23.00
Ranjit Singh Endowment	1330.00	213.60	1116.40	19.00	3.00	16.00
Arjun Dev Joneja Faculty Chair in Civil Engineering	150.00	150.00	0.00	2.00	2.00	0.00
BVR Mohan Reddy Family Endowment	100.00	100.00	0.00	0.00	0.00	0.00
1984 Class Fund	0.00	81.00	0.00	0.00	0.00	0.00
Next Generation Broadcasting Chair	128.70	128.70	0.00	1.80	1.80	0.00
Dr. Mahua Menon and Mr. Ranodeb Roy Young Faculty Research Fellowship	0.00	45.00	0.00	0.00	0.00	0.00
1995 Class SJR Fund	175.00	41.70	133.30	0.00	0.00	0.00
1980 Class Fund	200.00	29.50	170.50	0.00	0.00	0.00

AVIJIT LAL Memorial Fund	0.00	25.30	0.00	0.00	0.00	0.00
1997 Class Fund	0.00	24.00	0.00	0.00	0.00	0.00
Shujaat Ishaq Memorial Fund	0.00	23.00	0.00	0.00	0.00	0.00
Diamond Jubilee IITK	0.00	18.90	0.00	0.00	0.00	0.00
1979 Class Fund	0.00	18.40	0.00	0.00	0.00	0.00
Mr. & Mrs. Gian Singh Bindra Chair	0.00	16.20	0.00	0.00	0.00	0.00
Dr. Rajendra Rathore Seminar & Scholarship Fund	0.00	15.80	0.00	0.00	0.00	0.00
Dr. Rukmini Saraswat Gold Medal	0.00	12.50	0.00	0.00	0.00	0.00
Student With Disability Project	0.00	11.90	0.00	0.00	0.00	0.00
Kinra Scholarship	0.00	11.00	0.00	0.00	0.00	0.00
Prof. Samares Kar Memorial Gold Medal	0.00	6.50	0.00	0.00	0.00	0.00
Shrimati Tara Dube and Shri Raj Deva Dube Memorial Gold Medal	0.00	6.30	0.00	0.00	0.00	0.00

SURGE 2019, an outreach program for students from other institutions in the country which is supported by alumni contributions was conducted during summer 2019. The selection of participants is highly competitive as thousands of applications from various institutions are received, and this testifies to the increasing popularity of the program among students across the nation.

SURGE Office is also responsible for coordinating the logistics for students who have been selected by academies (such as SRFP, IAS, INAE etc).

No.	Particulars	SURGE 18	SURGE 19
01.	No. of Applications	2000	1400
02.	No. of Participants	123	145
03	No. of Academy Participants	25	25
04.	No. of Faculty members from IIT Kanpur mentoring (SURGE participants)	85	99

ALUMNI IMPACT

A.Selected Notable achievements in the field of science and technology by our alumni:

Our alumni have been proud recipients of various honours and awards in various categories during F.Y. 2019-20 as per the following details:

Category of Award	Number of Awards
Academic Awards	9
Industrial Awards	1
Government Awards	5

Some of the major achievements are as follows:

S. No.	Award	Name of Alumni	Award Endowed by
1.	Nano Innovation Award	Dr. Sandeep Patil (PhD/CHE/2013)	Bangalore Nano Innovation
2.	National E-Governance 2020	Dr. Abdul Qayum (BT/CE/2008)	Department of Administrative Reforms & Public Grievances, GoI.

3.	Member of National Academy of Engineering, USA.	Dr. Jayathi Y Murthy (BT/ME/1979)	National Academy of Engineering, USA.
4.	Member of National Academy of Engineering, USA.	Dr. Pawan K Goenka (BT/ME/1975)	National Academy of Engineering, USA.
5.	Member of National Academy of Engineering, USA.	Dr. Rajeev Gautam (BT/CHE/1974)	National Academy of Engineering, USA.
6.	Director's Fellowship	Dr. Mohit Bansal (BT/CSE/2004)	The Defence Advanced Research Projects Agency (DARPA).
7.	Presidential Fellowship	Mr. Mahesh Parustkar (MSc/CHM/2016)	Ohio State University.
8.	Jacobus Fellowship	Mr. Karan Singh (BT/CSE/2015)	Princeton University.
9.	Sloan Foundation Research Fellowship 2020.	Dr. Monika Raj (PhD/CHM/2009)	Sloan Foundation.
10.	Padma Shri	Dr. HC Verma (MSC2/PhD/PHY/1978/1980)	Republic of India.
11.	SERB-STAR	Dr. Jayant K Singh (BT/CHE/1997)	Science and Engineering Research Board, India.
12.	SERB-STAR	Dr. Animangsu Ghatak (MT/CHE/1998)	Science and Engineering Research Board, India.
13.	India's Noted Officer	Dr. Abdul Qayum (BT/CE/2008)	Govt. of India.
14.	Bronze Medal 2020	Dr.Srivatsan Seergazhi Gopalan (PhD/CHM/2003)	Chemical Research Society of India.
15.	Fellow	Dr. Kamesh Subbarao (BT/AE/1993)	The Royal Aeronautical Society (RAeS).
16.	Award of Excellence (Digital India Initiative)	Mr. Chanchal Kumar (BT/MT/CSE/1990/1993)	State Govt. of Bihar.

17.	Shanti Swarup Bhatnagar Award, 2020 in Chemical Sciences	Prof. Jyotirmayee Dash (PhD/CHM/2003)	Council of Scientific and Industrial Research (CSIR), Gov. of India

B. Notable entrepreneurial endeavours by some of our alumni:

S.No.	Name of the Alumni	Entrepreneur in the field of
1.	Mr. Hari Shankar (BT/CE/2018)	Founder of Agnys Waste Management - Vegetable and crop waste converted into organic fertilizer that gives more yield compared to chemical fertilizers. Compost is ready for use in liquid as well as solid form in 12-20 days, which helps in organic farming.
2.	Dr. Sandeep Patil (PhD/CHE/2013)	Founder of Indeema Fibers. The company develops a high performance UHMwPE (Ultra High Molecular Weight Polyethylene) fibres for bullet proof and anti-ballistic applications using gel-spinning technique.
3.	Mr. Saumya Shankar (BT/MME/1995)	Founder Jamura Robotics - Robotacharya- A robotic teaching assistant. An AI enabled Intelligent and interactive tutor that provides enhanced learning outcomes through deeper engagement, continuously upgraded web content. Through advanced AI/ML technology, the robot will take attendance, talk to students, display and read content and play extra content from the web related to the topic.
4.	Mr. Nishant Agarwal (MS/ME/2018)	Founder Life and Limb - Life and Limb are developing an Affordable Multi Fingered Prosthetic Hand for Trans-radial Amputee. The prosthetic hand shall have innovative features like Multi-fit arm with adjustable straps, single actuator for simple design, Compound finger mechanism to actuate the fingers, etc.

5.	Mr. Nandan Mishra (BT-MT (Dual)/CHE/2012)	Founder Pingala AI - Pingala AI builds artificial intelligence systems for industries in Supply, Process,, Assets, Compliance, and Energy area to leverage the transformational power of AI through their edge and centralized solutions turning data into value for the customers. Their AI/ML platform caters to build Tacit ML and Deep Learning for Process and Supply, Process, Assets, Compliance, and Energy industry.
6.	Mr. Rushikesh Chaudhari (BT-ME (Dual)/AE/2017)	Founder Tecrient Space - Developed a Hybrid VTOL Drone that would be used as Seeding Drones, Mapping Services, Quadcopter, Oil and Gas Pipeline inspection, UAVs, Payload Delivery and Logistics Delivery.
7.	Mr. Shobhit Singh (MT/Earth Sciences/2018)	Terraqua UAV Solutions is dedicated to provide research based most efficient scientific solutions to the both govt and non govt organizations. They are researchers specialized in solving real world problems using their expertise in contemporary UAV technology.
8.	Mr. Sharad Tripathi (BT/1969/AE)	Co-founder Nishkam Technology - Nishkam Technologies provide HVAC design optimization for large buildings such as hospitals, schools, official building, malls, etc. for energy efficiency, pollution removal, pathogen safety and fire safety. Their CFD simulations give credible testing of airflow, increased efficiency of all kinds of barriers. Nishkam's simulations are also used for buses, metro trains and other public transit solutions.

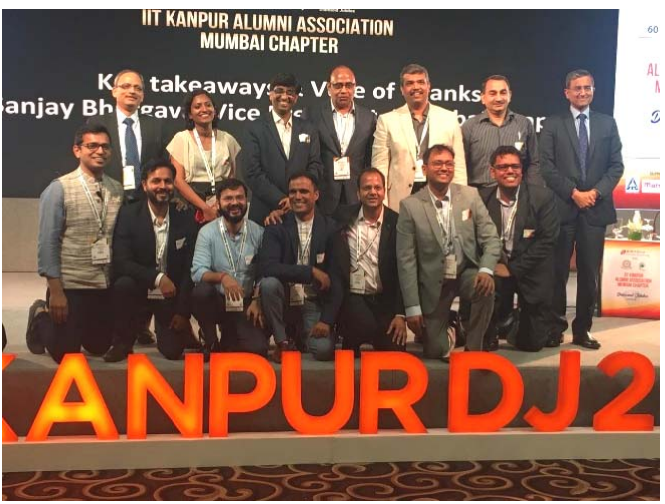
C. Some Notable Professional Achievements by our Alumni:

S.No.	Name of Alumni	Position
1.	Dr. Rishikesha Khrishnan (MSc/PHY/1986)	Director of IIM, Bangalore.
2.	Dr. V. Palaniappan (PHD/CHM/1988)	CTO of Aruvant Science Inc.
3.	Mr. Alok Agarwal (BT/AE/1987)	Appointed as the new Board Member of Prasar Bharti, India.
4.	Dr. Mahesh Gupta (BT/ME/1975)	Appointed as the nominee of UP Govt. on IIT Kanpur Board of Governors.
5.	Dr. Subramanian Anantha Ramkrishna (MSc/Physics/1995)	Appointed as Director of CSIR-CSIO, Chandigarh.
6.	Dr. Ajay Bhushan Pandey (BT/EE/1983)	Appointed as the new finance secretary of India.
7.	Dr. Arvind Krishan (BT/EE/1985)	Appointed CEO of IBM.
8.	Mr. R. K. Mathur (BT/ME/1975)	1st Lt. Governor of Ladakh

D. IITK Diamond Jubilee Events:

To mark sixty glorious years of excellence of IIT Kanpur, IITK Alumni Association had planned to organize several Diamond Jubilee celebration events in different cities across the country. Two such events were held in Bangalore and Delhi. The remaining events that were to be held in Delhi and other cities were cancelled due to Coronavirus pandemic.

The first Diamond Jubilee event was held on 29 Nov. 2019 in Bangalore. The event was graced by Dr. K. Radhakrishnan, Chairperson, BoG, IITK, who was also the Chief Guest. At the event, industry leaders, academicians and IITK faculty gave talks on the role of industry and academia in spearheading the technology innovation and on an impactful collaboration between industry and academia.



IITK Alumni Association, Mumbai held second such event on 22 Feb. 2020 in Mumbai. The event witnessed some insightful speeches by top industrialists and government officials like, Dr. Krishnamurthy Subramanian on ethical wealth creation; Dr. Pawan Goenka on Future of Mobility in India; Mr. Sanjeev Puri on Agrisector.

E. Other Alumni Events:

To mark the Diamond Jubilee Year of IIT Kanpur, special events were organized in the United States by our alums. IIT Kanpur was represented by the Director, Prof. Abhay Karandikar, Dean of Resources and Alumni, Prof. Jayant K. Singh, then Dean of Research & Development, Prof. S. Ganesh, Dean of Faculty Affairs, Prof. Debasis Kundu and Dean of International Relations, Prof. Yogesh Joshi. The events marked the felicitation of Mr. Ajeet Singh and Dr. Arvind Krishna, who could not attend the ceremony on IITK Foundation Day, 2 Nov. 2019. Events were interspersed with brainstorming sessions on stronger collaboration between our alumni and the institute and the role of alums in being the ambassadors of IITK.

F. Campaigns:

Various campaigns were launched to collect funds for different initiatives.

S.No.	Campaign Name (Memorial fund)	Amount Received (Rs. In Lakhs)
1.	Anand Prasad Gupta Memorial Fund	43.40
2.	Ankit Rathore Memorial Fund	35.00
3.	Dharmendra Srivastava Memorial Fund	3.30
4.	Shujaat Ishaaq Memorial Fund	22.97
5.	Vishesh Punjabi Memorial Scholarship	4.95

S No.	Campaign Name (Student & Community welfare)	Amount Received (Rs. In Lakhs)
1.	#OneAlumnusOneStudent	223.10
2.	**#**helpthehelpers	5.20

#OneAlumnusOneStudent proved to be one of the most successful campaigns of IITK. It was launched to raise funds for 600 undergraduate students, who come from economically weaker sections of the society, help provide them with IT hardware. Since IITK had decided to go completely online for at least semester-1 of the Academic Year 2020-2021 due to the Coronavirus pandemic, there were 600 such students who needed IT help in order to continue their studies online.

The campaign was launched on 22nd July 2020, and funds had to be collected by the end of August, as the semester was to begin on 1st September 2020. Donations poured in under CSR initiative and from our alumni to this cause amounting to Rs. 223.10 lakhs. The amount was used to reimburse IT hardware (laptop/broadband) cost purchased by students.

CSR Support for #OneAlumnusOneStudent

S.No.	Company	Amount Donated (Rs. In Lakhs)
1.	Kent RO Systems Ltd.	20.00
2.	Sterlite Tech Ltd.	25.00
3.	VPhrase Analytic Solutions Ltd.	1.50
4.	Sheela Foam Ltd.	1.00
5.	Pradeep Metals Ltd.	1.00

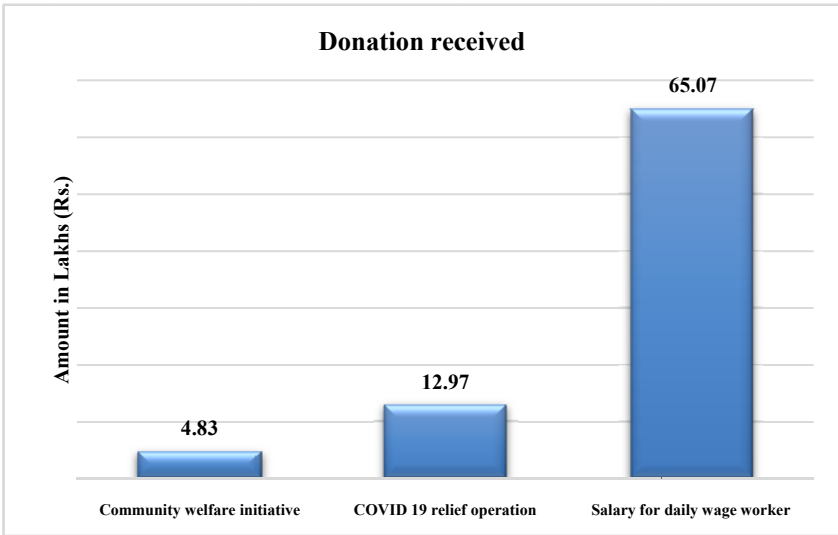
#OneAlumnusOneStudent	
Total Number of Donors (including CSR)	476
Maximum Number of IT Support Scholarships available.	442
Total Number of Students availed IT Support till date	291

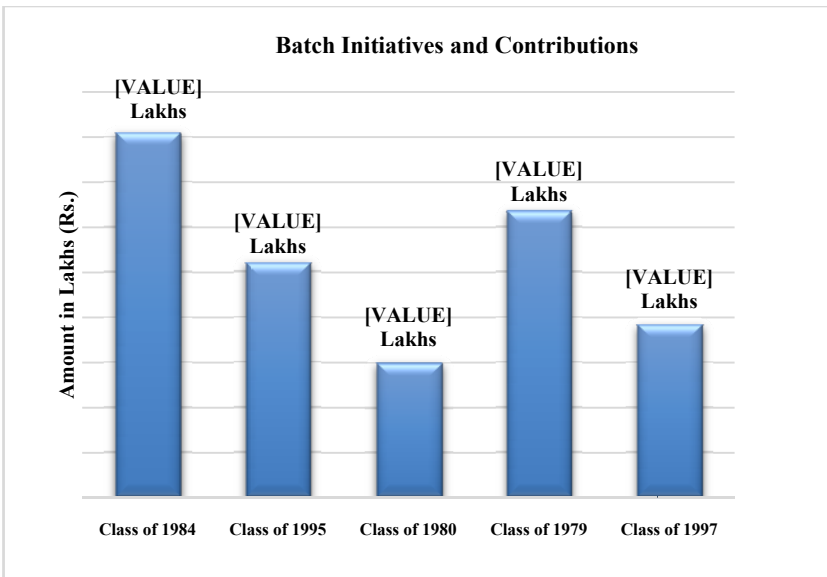
Campaigns During COVID-19 Lockdown:

Many community welfare campaigns were launched during the Covid-19 lockdown. Community welfare campaigns were primarily targeted at migrant workers/daily wagers to help provide them with everyday food essentials. During Relief Operation that ran from 26 March till 18 April 2020, food packets to 13,700 families were delivered. The ration packet had sufficient food grains sufficient for a family for 10 to 12 days. For those without a kitchen, cooked lunch packs were supplied to Nagar Nigam for distribution. This amounted to freshly cooked and packed 11,000 food packets that mostly went to migrant workers like rickshaw walas.

Name of Donors	Batch/Degree/ Prog.	Amount In Lakhs (Rs.)
Dev Joneja	BT/ME/1984	220.8
Rahul Mehta		156.04
Ranodeb Roy	BT/CSE/1990	57.85
Alok Agarwal	BT/EE/1979	39.9
Atal Bansal	BT/EE/1995	28
Jagjeet Singh Bindra	BT/CHE/1969	23.42
Mahesh Gupta	BT/ME/1975	20
Vijay Anand Saraswat	BT/EE/1982	12.5
Alok Agrawal	BT/CSE/1994	11.38
Vikram Kinra	BT/ME/1967	10.96
Mahesh Nandurkar		10
Ravi Sethi	BT/ME/1968	7.11
Amitabh Misra	BT/CHE/1995	7.1
Sanjay Kasturia	BT/EE/1981	5.83
Gajendra Singh	BT/CHE/1981	5.28
Uday Mahagaonkar	BT/CHE/1970	5.2
Ajay Kumar Bagaria	BT/CHE/1984	5
Lokvir Kapoor	BT/ME/1987	5
Mukesh Bansal	BT/CSE/1997	5
Pankaj Keshri	BT/CE/1995	5

Major Donors (June 2019 – September 2020)





Major Donations received towards Endowment Activities (in lakhs) (Sept. 2019-Sept. 2020)

SCHOLARSHIP	AMOUNT IN LAKHS (Rs.)
Avijit Lal Memorial Scholarship	25.32
Dr. Rajendra Rathore Scholarship	10.96
Neela Namjoshi Scholarship	10.80
Pramodini Agarwal Scholarship	10.80
Vishesh Panjabi Memorial Scholarship	4.95
Kinra Scholarship	10.96
Sudarshan Kasturia Memorial Scholarship	10.96
Shri D. P. Shukla and Smt. Shiv Kumari Shukla Scholarship	10.50

AWARDS AND MEDALS	AMOUNT IN LAKHS (Rs.)
Dr. Rukmini Saraswat Gold Medal	12.05
Shrimati Tara Dube and Shri Raj Deva Dube Memorial Gold Medal	6.25
Prof. Samares Kar Memorial Gold Medal	6.50
Mahatma Choa Kok Sui Meritorious Award	5.00
Medal For Excellence in Education (2 Silver nos)	6.00
Bogineni Chenchu Rama Naidu Gold Medal	0.50
Jayesh Memorial Award	0.50

OTHER STUDENT INITIATIVES	AMOUNT IN LAKHS (Rs.)
Nath Travel Grant	2.00
Diamond Jubilee IITK	2.00
Student with Disability Project	11.85
Team Humanoid Fund	2.27
Team Motorsports Fund	0.96

FACULTY CHAIRS & FELLOWSHIPS	AMOUNT IN LAKHS (Rs.)
Arjun Dev Joneja Faculty Chair in Civil Engineering	150.00
Dr. Ranjit Singh Chair for Rozi Shiksha Kendra	75.00
Dr. Mahua Menon and Mr. Ranodeb Roy Young	45.00

Faculty Research Fellowship	
Class of 1984 Chair	81.01
Batch of 1993 Young Faculty Fellowship	38.39
Prof. G D Agarwal Chair	7.84
Class 1980 Young Faculty Fellowship	30.01
Mr. & Mrs. Gian Singh Bindra Chair	19.91

DISTINGUISHED LECTURE SERIES	AMOUNT IN LAKHS (Rs.)
Dr. Rajendra Rathore Seminar	10.00
U B Tewari Memorial Fund For Excellence in Research and Teaching	15.75
Prof. A. N. Bose Bio Entrepreneurship Distinguished Lecture Series	8.70

CSR INITIATIVES (June 2019–Sept 2020)	Amount in lakh (Rs.)
Vtol Aviation Instrument	355.80
AIA Engineering Ltd.	125.00
HDFC Bank	100.00
ICICI Securities Ltd.	50.00
Standard Chartered Bank	50.00
INFO Edge Indian Limited	50.00
TCS Foundation	76.93
Power Finance Corporate	35.85
IDEA Cellular Ltd	5.00
REC Foundation	32.38
Portescap India Pvt Ltd.	30.00
Sterlite Technologies Ltd.	25.00
Ericsson India Global Services Pvt Ltd.	20.00
Penam Laboratories Ltd.	20.00
Kent R O Systems Limited.	20.00
Suraj Logistic Pvt Ltd.	19.50
Goods and Services Tax Network.	16.74
Nutanix En Engagements	10.00
Raramuri Tech. Pvt Ltd.	10.00
Bigzette Systems Pvt Ltd.	2.00
Prescience Insilico	1.00
Total	**1055.20**

INSTITUTE FACULTY

Recruitment

In the past one year, the Institute has offered 55 faculty positions against a rigorous selection from 1027 applicants. Out of these, 38 new faculty members have joined the Institute. The appointments per department are mentioned below:

Department	Number of new faculty
Aerospace Engineering	2
Biological Sciences and Bioengineering	2
Chemical Engineering	2
Chemistry	7
Civil Engineering	5
Earth Sciences	1
Electrical Engineering	1
Humanities and Social Sciences	1
Industrial and Management Engineering	1
Materials Science and Engineering	2
Mathematics & Statistics	5
Mechanical Engineering	2
Physics	2

During this period, we have also made 67 offers of post-doctoral fellowships, 16 visiting faculty, 16 adjunct faculty, and 2 Distinguished Honorary Professors.

Awards and Honours

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.

I am extremely happy to share with you the wonderful news that Professors Sudhir Kumar Jain (CE) and Harish Chandra Verma (PHY) has been awarded Padma Shri this year.Dr. Bushra Ateeq (BSBE) has be selected for the Shanti Swarup Bhatnagar Prize in Medical Sciences for the year 2020.

Dr. Arun Kumar Shukla (BSBE) has received the Young Scientist Award by Prof. H. S. Srivastava Foundation given for outstanding contributions in the emerging areas of Science and Technology. Dr. Bushra Ateeq (BSBE) has be selected for the Sayeeda Begum Women Scientist Prize 2019. Dr. Arun Shukla (BSBE) has been selected for the Young Chemical Biologist award 2019 by the International Chemical Biology Society (USA). Dr. Jayandharan Rao (BSBE) has been awarded the prestigious 2019-Global Hemophilia ASPIRE [Advancing Science through Pfizer Investigator Research Exchange] research award instituted by Pfizer Inc. USA.Dr. Arun K. Shukla (BSBE) has been selected for the Sun Pharma Research Award, for the year 2019 by SunPharma Science Foundation.Dr. Bushra Ateeq (BSBE) has been selected for the CSIR-CDRI Award-2020 for the excellence in drug research under Life Sciences category. Dr. Bushra Ateeq (BSBE) has been selected for the Wellcome Trust/DBT India Alliance, Senior Fellowship Award by Wellcome Trust/DBT India Alliance. Dr. Bushra Ateeq (BSBE) has been selected for CNR Rao Faculty Award for the Excellence in Research 2019

by IIT Kanpur. Professor Jayant K. Singh (CHE) has been chosen for SERB - Science and Technology Award for Research (SERB STAR) for the year 2019.Professor Animangsu Ghatak (CHE) has been chosen for SERB - Science and Technology Award for Research (SERB STAR) for the year 2019. Professor Jitendra K Bera (CHM) has been selected for Silver Medal by Chemical Research Society of India (CRSI) in recognition of his excellent contributions to research in chemistry. Dr. Basker Sundararaju (CHM) has been chosen for Merck Young Scientist Award by Merck. Professor D. H. Dethe (CHM) has been selected for the Bronze Medal of Chemical Research Society of India (CRSI) in recognition of his excellent contributions to research in chemistry Dr. Dharmaraja Allimuthu (CHM) has been chosen for Har-Gobind Khorana Innovative Young Biotechnologist Award (IYBA) by Department of Biotechnology (DBT)-India for the year 2019. Professor Sandeep Verma (CHM) (currently on deputation as Secretary, SERB) has been selected for the Shri S.R. Thakore Memorial Lecture (2020) Professor J. N. Moorthy (CHM) (currently on deputation as Director of IISER Thiruvananthapuram) has been awarded the SASTRA-CNR Rao Award for excellence in Chemistry and Materials Science for the year 2020. Professor Sandeep Verma (CHM) (currently on deputation as Secretary, SERB) has been selected for the Distinguished Alumnus Award of Banaras Hindu University. Professor Vinod Singh (CHM) has been selected for Prof. Asima Chatterjee Life Time Achievement Award Lecture-2020 by Asima Chatterjee Foundation. Professor Tarun Gupta (CE) has been chosen for the V. N. M. M. Award-2017 of IIT Roorkee. Professor Tarun Gupta (CE) has been selected for N C Nigam Chair Professor by IIT Kanpur. Professor Tarun Gupta (CE) has been awarded Gold Medal for the innovation “Electro-Surgical Cautery” by International Innovation Fair

(IIIF) 2019 in NSIC Hyderabad. Professor Sudhir Kumar Jain (CE) has been awarded Padma Shri. Dr. Gaurav Tiwari (CE) has been awarded IGS-Prof. Leonard's Annual Award for the year 2018.Dr. Sandeep Anand (EE) has been selected for "NASI-Young Scientist Platinum Jubilee Award - 2019". Dr. Ketan Rajawat (EE) has been selected for the INAE Young Engineer Award 2019. Professor Rajiv Sinha (ES) has been selected for Lalit Mohan Kapoor Chair by IIT Kanpur. Professor Indra Sen (ES) has received ATAL New India Challenges by NITI Aayog. Professor Debajyoti Paul (ES) has received Excellence-in-Teaching award by IIT Kanpur. Professor Braj Bhushan (HSS) has been selected for Platinum Jubilee Lecture at 107th Indian Science Congress 2020.Dr. Pradip Swarnakar has been selected for Distinguished Visiting Scholar by University of Technology Sydney, Australia. Professor E C Subbarao, the First regular head of the department of Metallurgical Engineering (MSE), IIT Kanpur is conferred the LIFE TIME ACHIEVEMENT AWARD by the National Academy of Engineering, India.Professor Dipak Mazumdar (MSE) has been awarded National Metallurgist Award 2019 by Ministry of Steel, Govt. of India. Professor K. Balani (MSE) has been awarded Nanomaterials and Energy Prize for the year by Institution of Civil Engineers, London, UK. Professor K. Biswas (MSE) has been selected for Ranjit Singh chair -2019 by IIT Kanpur. Professor Kallol Mandal (MSE) has been selected to receive "Excellence in Teaching Award" during Teacher's Day Function 2019 by IIT Kanpur. Professor Subhra Shankar Dhar (MTH&S) has received the prestigious C. R. Rao National Award given by the Ministry of Statistics and Programme Implementations, Government of India. Professor Shantanu Bhattacharya (ME) has been selected to receive the Er. M. P. Baya National Award-2019 by Institution of Engineering, India. Professor Shantanu

Bhattacharya (ME) has been selected for the NASI Reliance Platinum Jubilee Award-2019. Dr. Manjesh Kumar Singh (ME) has been awarded the first prize for his contributed oral talk at recently held IndiaTrib 2019 at IISc Bangalore, jointly organized by the Tribological Society of India and IISc Bangalore. Professor P. Venkitanarayanan (ME) has been selected for F. Zandman Award by Society for Experimental Mechanics, USA. Professor P. Venkitanarayanan (ME) has been selected to receive Excellence in teaching award by IIT Kanpur. Dr. Saurabh Mani Tripathi (PHY) has been awarded the IPA S. N. Seshadri Memorial Instrumentation Award in Physical Sciences – 2018 conferred by the Indian Physics Association. Dr. Joydeep Chakrabortty (PHY) has been selected for Buti Foundation Award for Excellence in Theoretical Physics, Astro physics and Biophysics for 2018. Dr. Anjani Kumar Tiwari (PHY), INSPIRE faculty fellow, has been awarded the prestigious INSA Young Scientist Medal 2019. Professor Harish Chandra Verma (PHY) has been awarded Padma Shri.

STUDENTS' AWARDS

The many prestigious scholarships and awards received by our students have been a matter of pride and pleasure for us. Ishanh Misra, Yatin Dandi, Durgesh Rajendra Agrawal, Yugesh Ajit Kothari, Anish Saxena, Gargi Singh, Varun Goyalreceived the Aditya Birla Scholarship. Parameswar Palreceived ACC Fellowship. Akansh Agarwal, Nandita Gupta, Akhilesh Kumar Gupta, Prateek Yadav, Varenya Srivastava received the O.P. Jems scholarship. Aman Saraf, Suyash Singh received Honda Yes scholarship. Shivani Agarwal received Pratibha Eaton Awards.

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

STUDENT ACTIVITIES

Students' Gymkhana, IIT Kanpur has strived to provide a platform for the students to hone their skills in extracurricular activities, becoming one of the most robust student-driven body even in the nation. Believing in the importance of societal and humane engagements for the holistic development of an individual, it has always been supported by the Institute in pursuing cultural activities, sports or exploring technical opportunities and other possible avenues to help students explore their interests. Here are some of the highlights over the last year of the Students' Gymkhana:

Entrepreneurship Cell

Entrepreneurship Cell (E-Cell), IIT Kanpur is a non-profit student's organization dedicated to promoting the spirit of entrepreneurship amongst the campus community.

Throughout the academic year, E-Cell conducts a plethora of events, lectures and workshops with **eSummit** as the annual flagship entrepreneurial event of IIT Kanpur.

E-Cell also conducted **Startup 101** which is a lecture series on entrepreneurship and startup related topics. E-Cell also conducted a week-long event named '**Business Week**' where a number of strategic competitions and activities were conducted, and '**Campus Hangouts**' were organized to enhance entrepreneurial know-how of the campus students.

Cloth collection Drive was a social initiative carried out over a span of two months. The collected clothes were taken to Mandhana for distribution among the unprivileged. This social initiative received appreciation from **MHRD Ministry** and our institute.

Vox Populi

The true essence and sanctity of journalism was upheld by the campus' journalism body, VoxPopuli; which brought itself a step closer to growth, and the campus community, nearer to the truth.

Vox also explored some new ideas to mark its presence amidst a larger audience by initiating a number of new series like:

Entrepreneurship series: to highlight the facilities/programs available for the community to achieve their entrepreneurial goals.

The unorthodox career choices series: to take us through the stories of those who took up the non-conventional career routes.

Voxatire: to highlight the campus' alarming issues.

A photographic series called the Nostalgia Sunday IITK: which gave us the stories and experiences of everyone who's been a part of IITK.

Vox Populi also brought back the Senate Samachar which bridged the gap between the Students' Senate and Students, and the Fresher's Print Edition which has stories majorly directed towards the freshers.

Outreach Cell

Outreach Cell conducted several activities throughout the year with the aim to strengthen alumni relations and improve student-alumni interaction through events like Alumni Chapter Meets and Alumni Buddy Program.

"**Alumni Chapter Meets**" was conducted in major metropolitan cities like Bangalore and Mumbai which witnessed great participation from students interning at these locations.

"**Alumni Buddy Program**" saw tremendous participation of around **150** alumni and **350** students. Along with this, **2000** alumni connections were made through LinkedIn.

In "**Tips from the Top**" series we not only increased the number of Alumni talks this year but also focussed on covering every niche domain of careers (Corporate (Consulting, Finance, etc.), UPSC, Research, etc.).

On the Institute publicity front, we conducted "**That's IITK**" and "**Ask IITK**" campaigns. "Ask IITK" campaign provides a platform to post any query with #AskIITK on Facebook

regarding any aspect of IIT Kanpur and someone from IIT Kanpur gets back to them. While “That’s IITK” focussed on releasing blogs on all platforms surrounding a student life on all aspects from gymkhana activities, branch-wise studies, to foriegn internships, sem-ex experiences etc.

Community Welfare Cell

The Community Welfare Cell is a student group that is committed to learning, understanding and helping the society within the institute as well as in its vicinity. CWC works in majorly five major domains - education, blood donation, spiritual well being, sustainable development, and awareness about gender and sexuality diversity.

Prayas worked to educate underprivileged sections of society. Apart from holding regular classes for children, we work

towards the personality development of students by organising competitive events in dance, painting, poetry, and games and sports.

Prakriti worked in the field of environmental awareness, social innovations, and impact assessment.

Raktarpan is dedicated to decrease the shortage of blood and increase awareness about blood donation among the campus community. Last financial year, we helped Blood Banks to collect about 671 blood units, handled more than 500 helpline requests and organised multiple awareness sessions throughout the year.

Unmukt is working to address the gender and sexual diversity in the community and to achieve equality against discrimination. And for this discussions, talks and meetings were held with the volunteers and the faculty advisor.

Vivekanand Samiti is working to spread the message of Swami Vivekananda among the campus residents, and helping the entire community tackle its problems through motivation and inspiration. They conducted regular meditation sessions, Geeta classes and various talks by eminent speakers. They also conducted various health camps and donation drives as part of run-up to convocation.

Students' Senate

The main policy drafting body of the Students' Gymkhana worked on and legislated various policies this year. Some of the major highlights are mentioned below:

- Various new entities like Design and Animation Club, Speedcubing Club, Brain & Cognitive Society, GameDev Society, Product Development Wing and Finance & Analytics Club were introduced in the Gymkhana catering to the varying interests of students.
- Provisions Provision of Reasonable Accommodations for **Differently-Abled Students in SPO exams** was considered to address the barriers faced by persons with disabilities during the whole process of Internship and placements
- Proposal for reformation of **Departmental Societies** was considered and accepted by the Senate to inculcate an academic environment in which students get all the support that they need in their departments at different points of time during their stay at IIT Kanpur.
- A review of the working of Gymkhana was conducted and various changes were made in the policies of Students' Senate and the structure of different bodies of the Gymkhana to improve their functioning. The concept of **Societies** was introduced leading to a 3-tier system of Clubs, Societies and Hobby Groups in Councils.
- Various Constitutional reforms were introduced like increasing female representation in the Senate, making the Senate more transparent and open to the General Body Members, making the Gymkhana documents gender neutral and introducing the concept of NoTA in Senate elections

Media and Cultural Council

The Media and Cultural Council is the epitome of all the activities falling in media and cultural domain of the campus. Comprised of over 14 clubs and hobby groups, the highlights of this year were:

- **Montage:**The annual literary, film, media and art festival was conducted after a gap of 2 years.
- **Cultural Meet 4.0:** IIT Kanpur's contingent performance witnessed an exponential rise in rankings in Cultural Meet 4.0 held at IIT Bombay. IIT Kanpur achieved overall **5th position among all IITs participated** in this edition compared to 9th in 2019.

- **Policy Conclave:** The second edition of Policy Conclave, an intra-campus event designed for the IITK community, was successfully conducted from 29th February to 1st March. Students' opinion. Society organized various sessions on the theme "POLICY RESEARCH". This aimed at proposing more research on policies related to issues of international importance and policy research as an alter-

nate career option. This was aimed to engage the students with the research aspect of Public policy and to provide them with exposure to have a look at this as a career option.

Science and Technology Council

The Science and Technology council has witnessed a remarkable year setting many milestones along the way. With the support of the Institute, we have seen an increase in our participation as well as performance on the National and International platforms.

8th Inter IIT Tech Meet – IIT Roorkee

The 7thInter IIT Tech Meet was held in IIT Roorkey during 20th to 22nd December, 2019. IIT Kanpur participated with a contingent of about 50 people in all the competitive and non-competitive events. We secured 2nd runners up position

bagging medals in 7 (**3 Gold, 3 Silver and 1 Bronze**) out of 8 competitive events.

Team ERA IITK

Team ERA-IITK, participated in **DJI Robomasters Challenge** held in Montreal, Canada and won the 3rd prize for IIT Kanpur.

TEAM IGVC (now known as TEAM VISiON)

Team IGVC (now known as Team VISiON) participated in **Intelligent Ground Vehicle Competition** organised at Oakland University, Michigan and won the **Lescoe Trophy** for IIT Kanpur standing at an overall 2nd position among 37 participants in 3 challenges. Team IGVC stood 3rd in the AutoNav Challenge, 3rd in Interoperability Challenge and 4th in Cyber Security Challenge.

TEAM Humanoid

Team Humanoid participated in **FIRA HuroCup 2019** held in South Korea and stood **5th in Archery Challenge** while participating in all the challenges, viz. Spring, Archery, Marathon, Basketball, Weightlifting.

Collaboration with Technopark@IITK

Technopark was one of the major additions to the institute this year, providing immense opportunities to the whole campus, especially the Science and Technology Council.

Research & Development

This year the council has also contributed to the research community, one of the major milestones being the acceptance of paper in the prestigious ICML workshop: Machine learning for global health.

Council Activities for Campus Students

The council has grown to 7 Clubs, 5 Societies, 6 Institute SNT Teams and 2 Wings. They organised a number of lectures and workshops on topics ranging from finance and consulting to Game development, thus covering every aspect of students' interest fields

ACADEMIC AND CAREER COUNCIL

UG Wing:

The Academics and Career Council has witnessed a glorious start to its first year, with a lot of collaborative and stand alone activities organised by all the wings to promote awareness and opportunities for research and career among the campus community:

- **The International Relations Wing** joined the OIR office staff in organising and streamlining various activities along with assisting them in their works, eliminating the gap between administration and students.
- **The Career Development Wing** kicked off its first year with organising the first of its kind Placement Preparation Season and Internship Preparation season, along with spreading awareness about different opportunities and career paths using collaborations with various organisations.
- **The Research Wing** routinely conducted a number of events, talks, and sessions, covering various aspects of research and work (including career options, research opportunities (on & off campus), guidance ses-

sions, departmental orientation sessions, and technical workshops).

- **The UG Academics Wing** acted as a primary division in helping the students to contact Institute bodies for academics and related purposes. It advocated for the need to incorporate new changes in the academic curriculum and catered to the needs of students.

PG Wing:

During the session 2019-20 PG wings conducted sessions to spread awareness and increase the involvement of students. The core team of the council with inter-wing collaboration has increased the reach of the council to the general body. The classified wing wise report is described below:

- **PG Academics Wing:** Some initiatives are taken by this wing are
    - PG Academics Orientation.
    - Session on presentation skills.
    - Data collection of Duration of completion of the degree: PG Academics wing has initiated department-wise data collection for outgoing Ph.D. students to seek a suggestive agenda before administration to take corrective steps.

- **Research Wing:** The wing has conducted two sessions focussed on research facilities, benefits of professional society, and paper writing skills in collaboration with Materials Advantage at IITK.

  Research @IITK, Facilities & Scope: First event of the wing (13/08/2019) was focused on research orientation and it was useful for new (Y19) as well other batch students. During the session, students were familiarized with major facilities and available research opportunities at institute. Further Mr. Vineeth Vijayan

(Student Chair, IEEE PES IITK Chapter) delivered a talk on benefits of professional societies.

Research Paper Writing: A session on "Research paper writing, writing skills and techniques for scientific journals" was conducted in collaboration with Materials Advantage @ IITK. Prof. Kantesh Balani (Materials Science and Engineering) delivered a talk on writing skills, approx. 400+ students attended the session.

- **International Relation Wing**: The IR decided the following to be its main objectives:
    - To create awareness about the existing foreign opportunities among the campus community.
    - To enhance and increase the opportunities for the campus students to go abroad (for collaborative work, exchange programs, conferences etc.) To achieve our objective, we are working in close contact with the Office of International Relations. The following are the events organized by the Wing:

      INSPIRE'19: INSPIRE session was an initiative of IR wing to felicitate transfer of knowledge among the student body for those who are interested in pursuing higher education abroad.

Games and Sports Council

This year, some of the new initiatives were the change of the structure of Freshers Inferno and Main Inferno. It also offered a chance to show their talent, explore a new sport, and get a bite of action all the while playing and competing with their batchmates.

IIT Kanpur successfully hosted several workshops including archery, ultimate, boxing, kabaddi, Horse riding and a District

Athletics Championship in the campus. Adventure Club successfully conducted the Kedarkantha Trek, Dodital Trek, Manali - Leh - Khardungla Cycling, Kanchenjunga Base Camp Trek(KBC), Goechala Trek- Sikkim, Sandaphu Trek- West Bengal, and Sarpass Trek- Himachal Pradesh. Shooting Club and Skating Club hosted several workshops throughout the year.

Our teams have once again proved their mettle yet again in this year's Udghosh. Almost all teams bagged medals with 4 teams bagging gold in spite of Udghosh seeing a rise in competition level due to participation of several colleges with sports quota.

Inter IIT Sports Meet:

The Aquatics Men and Women teams participated in the 35th Inter IIT Aquatics Meet held at IIT Guwahati. The teams performed well and bagged Silver in the Water Polo (Men) and overall 3rd position in Women's Swimming.

Our performance in Inter IIT 2019 was better than last year. Overall, Girls contingent has improved significantly and did

well this InterIIT, bagging GOLD medal in Table Tennis(W), SILVER medal in Badminton(W), BRONZE medal in Squash(W), 3rd position in Swimming(W) and 4th position in both Basketball(W) and Volleyball(W). We stood 3rd in the General Championship(Women).

On the other hand, Boys secured SILVER medal in Cricket, Squash(M) and Waterpolo(M), 3rd position in Athletics(M) and 4th position in Weightlifting. We stood 6th in the General Championship(Men). We had hard luck this time, but it only motivates us to improvise more and rise strong. Also, Mr. Soumarup Bhattacharyya had his record lift of 109kg(C&J) & bagging the title of 'Mr. InterIIT', and Mr. Gaurav Kumar for another record lift this year.

Festivals

Antaragni

The cultural festival, Antaragni reached new heights in its 54th edition where the team successfully managed a festival, with footfall of over 1.25 lakh.

The theme of the festival was ‘A Jester’s Dominion’, and lasted from 17th to 20th October 2019. These four days were flooded by magnificent performances by students from around 250 colleges of the country, accompanied by showcases by national and international artists of varied styles and artforms.
The festival started off with performance by the band, Gian Nobilee.This was followed by a performance from the Skrat, followed by When Chai Met Toast. The last night led us to the final night, concluded by the performance of Shankar Ehsaan Loy.

Techkriti

The technical and entrepreneurship festival, Techkriti saw its 26th edition with Techkriti ’20. With the theme of ‘Cybernetic Utopia, representing the endless possibilities and plethora of opportunities for everyone to nurture their technical and entrepreneurial skills, the festival created a utopian worldview with its earnest efforts to showcase technical and entrepreneurial advancements around the globe.

This Techkriti was featured with a historic edition of Techkriti Open School Championship (TOSC) which was held in 2

phases with 1st phase being held on 13th October 2019 in 25 cities all over India and 2nd phase on 22nd December 2019.

Technocruise, which happens to be based on the vision, taking the festival to each city and conducting various workshops and zonal rounds of our flagship events, witnessed great participation and enthusiasm from students in 28 cities in the Indian subcontinent.

Techkriti, for the very first time, conducted a Non-core weekend from 28th February to 1st March. The event consisted of various competitions, talks, and panel discussions focused on the finance industry, portfolio management, and technology in finance.

Techkriti'20 also did various social campaigns to fulfill its social responsibility including Health Campus for Institute students, workers, and mess workers on the campus. A new initiative known as NOSH (No One Sleeps Hungry), was introduced in this edition.

Udghosh

The UDGHOSH 2019 edition witnessed more than 40,000 footfall with nearly 1500 participants from more than 200 colleges all across India. With the introduction of new events like Swimming, Ultimate Frisbee, Women handball. Initiatives like Udaan (sports for specially abled), in which Mr. Muralikant Petkar (First Paralympic Gold medal & 1965 war hero) was invited as Chief Guest to motivate all the participants of Udaan and this was organised under supervision of CDAP. Performances of Mallkambh artists and India's Got Talent finalist caught attraction of freshers' in orientation. This year Udghosh welcomed Former Hockey India Captain Sardara

Singh Apart from sports, Udghosh also witnessed Indian-Rock concert (Sitar Metal) and Comedy Night by Nishant Suri and Rahul Dua, Talks by Anisha Dixit (a Youtuber known as Rickshawali) and Satyarup Siddhanta(youngest mountaineer in the world and the first from India to climb both the Seven Summits as well as Seven Volcanic Summits) The festival also included Mr. Udghosh a body-building championship judged by Mr. Mahendra chavan (World Champion body-building 90kg category) and Rohit Khatri (Fitness Expert on YouTube).

Other Highlights

1. The long pending Chowpatty initiative is finally on roll within this CEMMC'stenure. Chowpatty offers five food outlets ranging from South Indian, Chinese, Snacks, shakes to a full fledge non veg shop.
2. Shiru Café was inaugurated this year on 10th November 2019, and it had itsunique marketing strategy of offering 3 free drinks a day per student, faculty or staff of IIT Kanpur.
3. A comprehensive Health Camp was conducted at Health Centre,IIT Kanpur from 8th June to 3rd August which catered to more than 550undergraduate, postgraduate and non-student campus residents. The campincluded check-up of cholesterol and haemoglobin levels, TSH and urine testalong with blood work and ECG.
4. The first day of the camp (8th June) was attended by around 250 people followed by ~ 50 people on a weekly basis.

COUNSELLING SERVICE

Overview and Team Strength

The Counselling Service (CS) primarily provides emotional, academic and financial assistance to students. The CS tries to bring the human touch in a highly competitive academic environment and lends a helping hand to those students who are in emotional, academic or financial distress, thereby trying to create a home away from home.

CS consists of a team of professional counselors, psychiatrists and a group of student volunteers dedicated towards the welfare of the student community. Currently, there are 3 professional counselors, 1 assistant counselors and 3 psychiatrists who regularly visit the Institute.

The student team comprises an undergraduate wing and a postgraduate wing. The UG wing has 5 core team members. They have 13 assistant coordinators and 6 guidance team members. Further there are approximately 140 student guides, 115 academic mentors and 3 volunteers, whereas the PG wing has 8 Core Team members and 75 volunteers.

Counselor and Psychiatrists' Sessions

Students typically meet the counselors in two modes – they sometimes approach the counselors of their own volition or they are referred to the CS by their friends, faculty members, psychiatrists or the doctors at the Health Centre. Students with academic difficulty are also encouraged to meet the counselors for relief.

The psychiatrists typically visit the campus at least twice a month. If the need arises, then they visit more often. One of the psychiatrists, in fact visits the Health Center every Saturday and many of the students in need consult him there. In

times of an emergency, the student is directly sent to the psychiatrist's clinic, along with an attendant. All the activities related to a psychiatrist's visit are coordinated by the Counselling Service.

The Counseling Service also has taken two initiatives in the previous session. The first was the deaddiction clinic, which addresses the problems of students facing any kind of addictions. The second was a mental health initiative titled "Samvad." Numerous programs were held over the calendar year under the banner of Samvad. The programs have had a lot of impact on the community.

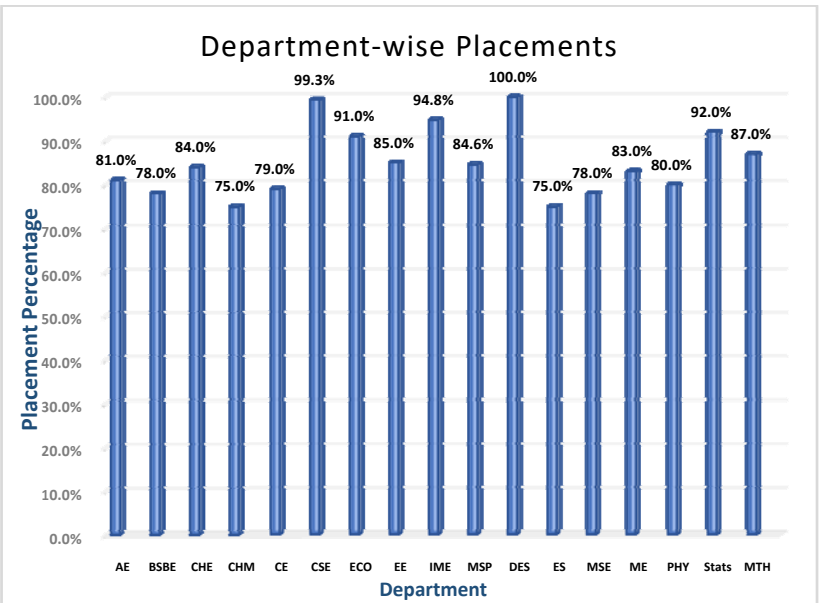
Financial Assistance

Through the STUDENTS BENEVOLENCE FUND (SBF), the Counselling Service provides financial assistance to needy students in the form of scholarships. This is available for those financially needy students, who have been unable to acquire any other financial assistance from the institute. The SBF scholarship is Rs.1500 per month and given for a period of 9 months. Apart from this, SBF Loans are also available to those who are in dire need of money.

STUDENT PLACEMENT

1136 students had registered with Student Placement Office for Campus Recruitment Drive 2019-20. As with previous years, recruitment drive for the academic year 2019-20 was held in two phases. Phase 1 of recruitments officially started on 1st of December and extended till 13th December 2019. Approximately 297 recruiters visited campus during Phase 1 to hire students for full time employment. 41 top tier firms from various sectors visited campus for recruitment on December 1st where an unprecedented 277 job offers were extended to

IITK students. Based on hiring numbers, the top recruiter for placement season was Bajaj Finance Limited, which hired 35 students. Other top recruiters of the season were Microsoft India Pvt Ltd, Qualcomm India Pvt Ltd, Samsung, Goldman Sachs, Intel Technology India Pvt Ltd, EXL services etc. Phase 2 of recruitments started in January and extended till June, 2020. More than 335 companies visited IITK campus for recruitment during the two phases of placements. A summary of department wise placement record for the current placement season is included in figure below.



Approximately 86% of the graduating batch (975 out of the 1136 registered students) were placed through Student Placement Office during the academic year 2019-20. This includes students in both UG and PG levels. 463 out of 532 registered students in B. Tech and B.S. degree programs (approx. 87.03%) were placed during the season. UG

placement count also includes 116 accepted PPOs extended to them as part of academic internship provided through SPO. Approximately 84.8% of registered PG students (512 out of 604) were also placed through SPO during campus recruitment drive. Amongst the various post graduate programs, Master of Design (M. Des.) recorded 100% placements followed by MBA where 94.3%, and dual degree program where 94.2% of the students got placed during the current placement season.

EPILOGUE

Amidst the global health crisis and disruption in all activities caused by Covid-19 pandemic, it is indeed an unprecedented situation in the history of IIT Kanpur as well. It is for the first time that we are forced to have a virtual convocation! I am indeed saddened that we cannot host all of you on our beautiful campus to celebrate this momentous occasion in your life.

The graduating students lost their precious moments of their final years on the campus when all the halls of residence had to be vacated in the interest of good health and well-being of all of you. While I am deeply saddened that those moments lost cannot be regained, 'life has to move forward'.

On this most momentous occasion, let me congratulate those who are being awarded their degree! Those who are beaming with great joy and a sense of accomplishment! Hearty Congratulations!! Further, I also extend my heartfelt congratulations to their parents and family, who have made a lot of sacrifices in educating their children in IIT Kanpur.

I also congratulate all awards and medal winners. At this Convocation, we are conferring Outstanding PhD Thesis Awardsfor the first time. Congratulations to all PhD scholars. I feel immensely happy that you all have achieved this great feat and I can be a part of this special day of your life.

Considering the fact that you are graduating during these extraordinary times, there may be hurdles ahead, and there may be crisis in job opportunities and traditional employment options. I earnestly urge you not to get disheartened but be optimistic and be on the lookout for the opportunities. I am aware that some of you have lost their jobs, some others have deferred placements. Institute will make every effort to help you with our vast network of alumni and industry connects.

The role of youth in nation building is vital and tremendous. Admittedly, the responsibility on the youth in the present day situation is enormous. Our country is undergoing a significant economic and social transformation. There has been an increasing focus on reducing the dependence on other nations and developing an indigenous ecosystem. The Govt of India has launched several initiatives such as ‘Vocal for Locals’, ‘Atmanirbhar Bharat’, ‘Make in India’, ‘Start-up India’, etc. These initiatives and the associated enabling environment offer tremendous opportunities for the youth - especially talented IIT graduates such as you - to become ‘job-givers’ rather than ‘job-seekers’. I am confident that the energy and enthusiasm of the young talentin an enabling environment can do wonders.

I wish you all the best in your future endeavours – in whatever you do, stay focussed, and work with passion. Remember that you are ina privileged class, who have been fortunate to have

received the best education in the country. It is now your turn to give back to the society and the nation.I assure you that IIT Kanpur will always be there to support you. Stay in touch and enhance the glory of your alma mater wherever you go!
With the hope to meet you someday on our beloved campus when things return to normal! Stay healthy, and stay safe.

With Best wishes for a new beginning!
Jai Hind!

-Abhay Karandikar

Books published

1 Immersed Boundary Methods – Development and Applications, S. Roy, A. De (AE), E. Balaras, Springer Singapore, 2020, ISBN: 978-981-15-3940-4.

2 Innovations in Sustainable Energy and Cleaner Environment, A. K. Gupta, A. De (AE), S. K. Aggarwal, A. Kushari (AE), A. K. Runchal, Springer Singapore, 2019, ISBN: 978-981-13-9012-8.

3 DNS of Wall-Bounded Turbulent Flows' and co-edited the book 'High Performance Computing of Big Data for Turbulence and Combustion, Tapan K. Sengupta (co-author) (AE), Springer.

4 Chemical and Synthetic Biology Approaches to Understand Cellular Functions - Part A, Arun. K Shukla (Guest Editor) (BSBE), Elsevier, 2019, ISBN: 978-0-12-818117-1.

5 Chemical and Synthetic Biology Approaches to Understand Cellular Functions - Part B, Arun. K Shukla (Guest Editor) (BSBE), Elsevier, 2019, ISBN: 978-0-12-818119-5.

6 G Protein-Coupled Receptors, Part B, Arun. K Shukla (Guest Editor) (BSBE), Elsevier, 2019, ISBN: 978-0-12-815107-5.

7 Chemical and Synthetic Biology Approaches to Understand Cellular Functions - Part C, Arun. K Shukla (Guest Editor) (BSBE), Elsevier, 2020, ISBN: 978-0-12-819128-6.

8 GPCR Signaling in Cancer, Arun. K Shukla (Guest Editor) (BSBE), Elsevier, 2020, ISBN:978-0-12-820230-2.

9 Cyber Security in India: Education, Research and Training, Manindra Agrawal (CSE), Sandeep Kumar Shukla (CSE), Springer-Singapore, 2020, ISBN: 978-981-15-1674-0.

10 Economic and Financial Integration in South Asia A Contemporary Perspective, Sanjay Sehgal, Wasim Ahmad (ESc), Piyush Pandey, Sakshi Saini, Routledge-London, 2021, ISBN: 978-0-8153-8013-9 (Hardbook) ISBN: 978-1-003-09756-3 (eBook).

11 Advances in Energy and Power Systems, Springer Notes in Electrical Engineering, S N Singh (EE), Springer Nature Singapore Pte Ltd,2018, ISBN: 978-981-13-0662-4.

12 Advances in System Optimization and Control, Springer Notes in Electrical Engineering, S N Singh (EE), Springer Nature Singapore Pte Ltd, 2018, ISBN: 978-981-13-0665-5.

13 ICRRM 2019-System reliability, Quality Control, Safety, Maintenance and Management, S N Singh (EE), Springer Nature Singapore Pte Ltd, 2020, ISBN: 978-981-13-8506-3.

14 Engineering Electromagnetics, 8/e (SIE), 2nd Reprint, W H Hayt, J A Buck, M J Akhtar (EE), McGraw Hill Education (India) Private Ltd., 2019, ISBN:13-978-93-392-0327-6.
15 Mathematical aspects of signal processing, P. Sircar (EE), Cambridge University Press-, 2016, ISBN: 9781316 796832.
16 Industry Standard FDSOI Compact Model BSIM-IMG for IC Design, Chenming Hu, Sourabh Khandelwal, Yogesh S Chauhan (EE), Thomas Mckay, Josef Watts, Juan P Duarte. Pragya Kushwaha, and Harshit Agarwal, ELSEVIER, 2019, ISBN: 9780081024010.
17 Mathematical aspects of signal processing, P. Sircar (EE), Cambridge University Press, 2016, ISBN: 9781316 796832.
18 Intelligent Condition Based Monitoring: For Turbines, Compressors, and other Rotating Machines, Nishchal K. Verma (EE), Al Salour,Studies in Systems, Decision and Control, Springer, 2020, ISBN: 978-981-15-0512-6.
19 Computing Algorithms with Applications in Engineering, Proceedings of ICCAEEE 2019, Nishchal K. Verma (EE), Vinod Kumar Giri, Raj Kumar Patel, Vijay Pratap Singh, Advances in Intelligent Systems, Springer, 2020, ISBN: 978-981-15-2369-4.
20 Computational Intelligence: Theories, Applications and Future Directions-Volume I (ICCI-2017), Nishchal K. Verma (EE), A. K. Ghosh (AE), Springer, 2019, ISBN: 978-981-13-1131-4.
21 Computational Intelligence: Theories, Applications and Future Directions-Volume II (ICCI-2017), Nishchal K. Verma (EE), A. K. Ghosh (AE), Springer, 2019, ISBN: ISBN 978-981-13-1134-5.
22 Naval, Prashant Bagad (HSS), Rohan Prakashan-Pune, India, 2020 Forthcoming.
23 Regulatory Framework for Long-term Demand Forecasting and Power Procurement Planning, Anoop Singh (IME), Manvendra Pratap, Abhishek Das, Piyush, A Sharma, Kamal K Gupta, Centre for Energy Regulation, IIT Kanpur-Kanpur, 2019, ISBN: 978-93-5321-969-7.
24 Working Paper Series: Lecture Notes in Management Science: Vol 3", A collection of 150 working papers, R. R. K. Sharma (IME), EXCEL PUBLISHERS NEW DELHI, 2020, ISBN: 978-93-89947-08-3.
25 Working Paper Series: Lecture Notes in Management Science: Vol 1", A collection of 148 working papers, R. R. K. Sharma (IME), EXCEL PUBLISHERS NEW DELHI, 2019, ISBN:9-789-388-237116.
26 Piezoelectric Energy Harvesting in Biomechanical Applications, Ritamay Bhunia, Bushara Fatma, Shashikant Gupta, Prateek Prajapati, Raju Gupta and Ashish Garg (MSE), Elsevier Series on Energy Harvesting, Invited, 2020.

27 Architecting Robust Co-Design of Materials, Products, and Manufacturing Processes, Nellippallil, A. B. Allen, J. K. Gautham, B. Singh, A. K. Mistree, Amarendra Kumar Singh (MSE), Springer, 2020.

28 High Entropy Alloys in Bulk Form: Processing Challenges and Possible Remedies in HIGH ENTROPY ALLOYS: Innovations, Advances and Applications, Reshma Sonkusare, Surekha Yadav, N P Gurao (MSE) and Krishanu Biswas (MSE), Springer-New York, 2019, ISBN: In press

29 Infiltration Technique to Fabricate Nano-structured Electrodes for High-Performance Solid Oxide Fuel Cells, Chemical Solution Synthesis for Materials Design and Thin Film Device Applications, Soumen Das and Sandip Dhara, Shobit Omar (MSE), Elsevier, 2020.

30 Rough Sets. International Joint Conference, IJCRS 2019 Debrecen, Hungary, June 17-21, 2019, Proceedings. Lecture Notes in Artificial Intelligence (LNAI) 11499, Tamás Mihálydeák, Fan Min, Guoyin Wang, Mohua Banerjee (MTH&S), Ivo Düntsch, Zbigniew Suraj, Davide Ciucci, Springer Nature -Switzerland AG,2019, ISBN: 978-3-030-22815-6.

31 Fundamentals of Convective Heat Transfer, Biswas Gautam (ME), Dalal Amaresh and Dhir Vijay K., CRC Press-Boca Raton, London, New York,2019, ISBN: 978-1-138-10329-0.

32 Simulations and Optical Diagnostics for Internal Combustion Engines Current Status and Way Forward,Akhilendra Pratap Singh, Pravesh Chandra Shukla, Joonsik Hwang, Avinash Kumar Agarwal (ME),Springer-Singapore, 2019, ISBN: 978-981-15-0335-1.

33 Advanced Combustion Techniques and Engine Technologies for the Automotive Sector, Akhilendra Pratap Singh, Nikhil Sharma, Ramesh Agarwal, Avinash Kumar Agarwal (ME), Springer-Singapore, 2019, ISBN:978-981-15-0368-9.

34 Alternative Fuels and Their Utilization Strategies in Internal Combustion Engines, Akhilendra Pratap Singh, Yogesh C. Sharma, Nirendra N. Mustafi, Avinash Kumar Agarwal (ME), Springer-Singapore, 2019, ISBN: 978-981-15-0417-4.

35 Solar Energy Systems, Challenges, and Opportunities,Himanshu Tyagi, Prodyut Chakraborty, Satvasheel Powar, Avinash Kumar Agarwal (ME), Springer-Singapore, 2019, ISBN: 978-981-15-0675-8.

36 Measurement, Analysis and Remediation of Environmental Pollutants,Tarun Gupta (CE), Swatantra Pratap Singh, Prashant Rajput, Avinash Kumar Agarwal (ME), Springer-Singapore, 2019, ISBN: 978-981-15-0540-9.

37 Paper Microfluidics Theory and Applications, Shantanu Bhattacharya (ME), Sanjay Kumar, Avinash Kumar Agarwal (ME), Springer-Singapore, 2019, ISBN: 978-981-15-0489-1.

38 Design and Development of Heavy-Duty Diesel Engines, P. A. Lakshminarayanan, Avinash Kumar Agarwal (ME), Springer-Singapore, 2019, ISBN: 978-981-15-0970-4.
39 Automotive Tribology, Jitender Katiyar, Vinay Kumar Patel, Shantanu Bhattacharya (ME), Springer-Singapore, 2019, ISBN: 978-981-15-0433-4.
40 Theory for the FCC-ee: Report on the 11th FCC-ee Workshop Theory and Experiments; Monographs, Joydeep Chakrabortty (PHY), CERN Yellow Report-CERN, Geneva Switzerland, 2020, ISSN 2519-8076 (Online), ISSN 2519-8068 (Print).
41 Energy Transfers in Fluid Flows: Multiscale and Spectral Perspectives, Mahendra K. Verma (PHY), Cambridge University Press.

Fellowships

1 Dr. Ashoke De (AE) has been elected as a Fellow of West Bengal Academy of Science & Technology (WAST) for the year 2019.
2 Professor Bushra Ateeq (BSBE) has been elected as Senior Fellow by Wellcome Trust/DBT India Alliance.
3 Drs. Santosh Kr. Misra, Nitin Mohan & Dibyendu Kr. Das, (BSBE), have been declared recipients of the prestigious Ramalingaswami Re-entry Fellowship by Department of Biotechnology (DBT) for the year 2018-19.
4 Professor Rajesh Sathiyamoorthy (CE) has received Talented Young Scientist Fellowship by Ministry of Science and Technology, China.
5 Professor Tarun Gupta (CE) has been elected as ISEES FELLOW International Society for Energy, Environment and Sustainability.
6 Professor S. P. Rath (CHM) has been elected as a fellow of Indian Academy of Sciences, Bangalore.
7 Dr. Ritika Gautam (CHM) has been chosen for DST-INSPIRE Faculty Fellowship for 5 years by Department of Science and Technology.
8 Dr. Nagma Parveen (CHM) has been chosen for DST-INSPIRE Faculty by Department of Science and Technology.
9 Dr. Wasim Ahmad (Ecos) has been chosen for Subir Chowdhury Post-doctoral Fellowship on Quality and Economics, 2019-2020 by London School of Economics and Political Science (LSE), London, UK.
10 Professor Animesh Biswas (EE) (presently on deputation as Director), National Institute of Technology, Rourkela) has been elected as a Fellow of West Bengal Academy of Science & Technology (WAST) for the year 2019.
11 Professor Debajyoti Paul (ES) has renewed Research Fellowship by Alexander von Humboldt Foundation.

12 Professor Braj Bhushan (HSS) has been elected as Fellow of Shastri Mobility Programme by Shastri Indo-Canadian Institute.
13 Dr. Ritwij Bhowmik (HSS) has received “2020-2021 Fulbright-Nehru Academic and Professional Excellence Fellowships” by The United States – India Educational Foundation (USIEF).
14 Professor B. V. Rathish Kumar has been elected as ISMMACS Fellow by ISMMACS.
15 Professor Avinash Kumar Agarwal (ME) has been selected as the Fellow of the American Association for the Advancement of Science (AAAS) in the Section on Engineering.
16 Professor Sameer Khandekar (ME) has been elected as Fellow of Indian National Academy of Engineering FNAE, by Indian National Academy of Engineering.
17 Professor Avinash Kumar Agarwal (ME) has been selected as Sir J. C. Bose fellow Science and Engineering Research Board, GoI.
18 Professor Shantanu Bhattacharya (ME) has been elected as Fellow of Institution of Electronics and Telecommunication Engineering.
19 Dr. Krishanu Biswas (MSE) has been elected as Fellow, West Bengal Academy of Science and Technology (WBST) 2019.
20 Professor Mahendra K. Verma (PHY) has been elected as a fellow of Indian Academy of Sciences.
21 Professor Mahendra K. Verma (PHY) has been selected as an INSA fellow this year (2019).
22 Dr. Arjun Bagchi (PHY) has been awarded with Swarna Jayanti Fellowship from Department of Science and Technology, Government of India for the year 2018-19.
23 Dr. Joydeep Chakrabortty (PHY) has received P.K. Kelkar Research fellowship by IIT Kanpur.
24 Dr. Arjun Bagchi (PHY) has received P.K. Kelkar Research fellowship by IIT Kanpur.

Awards and Honors

1 Dr. Arun Kumar Shukla (BSBE) has received the Young Scientist Award by Prof. H. S. Srivastava Foundation given for outstanding contributions in the emerging areas of Science and Technology.
2 Dr. Bushra Ateeq (BSBE) has be selected for the Sayeeda Begum Women Scientist Prize 2019.
3 Dr. Arun Shukla (BSBE) has been selected for the Young Chemical Biologist award 2019 by the International Chemical Biology Society (USA).

4 Dr. Jayandharan Rao (BSBE) has been awarded the prestigious 2019-Global Hemophilia ASPIRE [Advancing Science through Pfizer Investigator Research Exchange] research award instituted by Pfizer Inc. USA.

5 Dr. Arun K. Shukla (BSBE) has been selected for the Sun Pharma Research Award, for the year 2019 by SunPharma Science Foundation.

6 Dr. Bushra Ateeq (BSBE) has been selected for the CSIR-CDRI Award-2020 for the excellence in drug research under Life Sciences category.

7 Dr. Bushra Ateeq (BSBE) has been selected for the Wellcome Trust/DBT India Alliance, Senior Fellowship Award by Wellcome Trust/DBT India Alliance.

8 Dr. Bushra Ateeq (BSBE) has been selected for CNR Rao Faculty Award for the Excellence in Research 2019 by IIT Kanpur.

9 Professor Jayant K. Singh (CHE) has been chosen for SERB - Science and Technology Award for Research (SERB STAR) for the year 2019.

10 Professor Animangsu Ghatak (CHE) has been chosen for SERB - Science and Technology Award for Research (SERB STAR) for the year 2019.

11 Professor Jitendra K Bera (CHM) has been selected for Silver Medal by Chemical Research Society of India (CRSI) in recognition of his excellent contributions to research in chemistry.

12 Dr. Basker Sundararaju (CHM) has been chosen for Merck Young Scientist Award by Merck.

13 Professor D. H. Dethe (CHM) has been selected for the Bronze Medal of Chemical Research Society of India (CRSI) in recognition of his excellent contributions to research in chemistry

14 Dr. Dharmaraja Allimuthu (CHM) has been chosen for Har-Gobind Khorana Innovative Young Biotechnologist Award (IYBA) by Department of Biotechnology (DBT)-India for the year 2019.

15 Professor Sandeep Verma (CHM) (currently on deputation as Secretary, SERB) has been selected for the Shri S.R. Thakore Memorial Lecture (2020)

16 Professor J. N. Moorthy (CHM) (currently on deputation as Director of IISER Thiruvananthapuram) has been awarded the SASTRA-CNR Rao Award for excellence in Chemistry and Materials Science for the year 2020.

17 Professor Sandeep Verma (CHM) (currently on deputation as Secretary, SERB) has been selected for the Distinguished Alumnus Award of Banaras Hindu University.

18 Professor Vinod Singh (CHM) has been selected for Prof. Asima Chatterjee Life Time Achievement Award Lecture-2020 by Asima Chatterjee Foundation.
19 Professor Tarun Gupta (CE) has been chosen for the V. N. M. M. Award-2017 of IIT Roorkee.
20 Professor Tarun Gupta (CE) has been selected for N C Nigam Chair Professor by IIT Kanpur.
21 Professor Tarun Gupta (CE) has been awarded Gold Medal for the innovation “Electro-Surgical Cautery” by International Innovation Fair (IIIF) 2019 in NSIC Hyderabad.
22 Professor Sudhir Kumar Jain (CE) has been awarded Padma Shri.
23 Dr. Gaurav Tiwari (CE) has been awarded IGS-Prof. Leonard’s Annual Award for the year 2018.
24 Dr. Sandeep Anand (EE) has been selected for "NASI-Young Scientist Platinum Jubilee Award - 2019".
25 Dr. Ketan Rajawat (EE) has been selected for the INAE Young Engineer Award 2019.
26 Professor Rajiv Sinha (ES) has been selected for Lalit Mohan Kapoor Chair by IIT Kanpur.
27 Professor Indra Sen (ES) has received ATAL New India Challenges by NITI Aayog.
28 Professor Debajyoti Paul (ES) has received Excellence-in-Teaching award by IIT Kanpur.
29 Professor Braj Bhushan (HSS) has been selected for Platinum Jubilee Lecture at 107th Indian Science Congress 2020.
30 Dr. Pradip Swarnakar has been selected for Distinguished Visiting Scholar by University of Technology Sydney, Australia.
31 Professor E C Subbarao, the First regular head of the department of Metallurgical Engineering (MSE), IIT Kanpur is conferred the LIFE TIME ACHIEVEMENT AWARD by the National Academy of Engineering, India.
32 Professor Dipak Mazumdar (MSE) has been awarded National Metallurgist Award 2019 by Ministry of Steel, Govt. of India.
33 Professor K. Balani (MSE) has been awarded Nanomaterials and Energy Prize for the year by Institution of Civil Engineers, London, UK.
34 Professor K. Biswas (MSE) has been selected for Ranjit Singh chair - 2019 by IIT Kanpur.
35 Professor Kallol Mandal (MSE) has been selected to receive “Excellence in Teaching Award” during Teacher's Day Function 2019 by IIT Kanpur.

36 Professor Subhra Shankar Dhar (MTH&S) has received the prestigious C. R. Rao National Award given by the Ministry of Statistics and Programme Implementations, Government of India.

37 Professor Shantanu Bhattacharya (ME) has been selected to receive the Er. M. P. Baya National Award-2019 by Institution of Engineering, India.

38 Professor Shantanu Bhattacharya (ME) has been selected for the NASI Reliance Platinum Jubilee Award-2019.

39 Dr. Manjesh Kumar Singh (ME) has been awarded the first prize for his contributed oral talk at recently held IndiaTrib 2019 at IISc Bangalore, jointly organized by the Tribological Society of India and IISc Bangalore.

40 Professor P. Venkitanarayanan (ME) has been selected for F. Zandman Award by Society for Experimental Mechanics, USA.

41 Professor P. Venkitanarayanan (ME) has been selected to receive Excellence in teaching award by IIT Kanpur.

42 Dr. Saurabh Mani Tripathi (PHY) has been awarded the IPA S. N. Seshadri Memorial Instrumentation Award in Physical Sciences – 2018 conferred by the Indian Physics Association.

43 Dr. Joydeep Chakrabortty (PHY) has been selected for Buti Foundation Award for Excellence in Theoretical Physics, Astro physics and Biophysics for 2018.

44 Dr. Anjani Kumar Tiwari (PHY), INSPIRE faculty fellow, has been awarded the prestigious INSA Young Scientist Medal 2019.

45 Professor Harish Chandra Verma (PHY) has been awarded Padma Shri.

Appointments

1 Professor D. P. Misra (AE) is appointed the Director of National Institute of Technical Teachers' Training and Research, Kolkata.

2 Dr. Arun Kumar Shukla (BSBE) has been selected for the Associateship of the Indian Academy of Sciences, Bangalore.

3 Dr. Jayandharan G. Rao (BSBE) has been included in the National Gene therapy Advisory and evaluation committee [GTAEC]- an apex committee of the Department of Health Research, Ministry of Health and Welfare, Government of India, that will facilitate gene therapy product development and clinical trials in the country.

4 Professor Yogesh Joshi (CHE) has been appointed to the Editorial Advisory Board of the AIP journal: Physics of Fluids.

5 Professor Sandeep Verma (CHM) is appointed the Secretary at Science and Engineering Research Board, New Delhi.

6 Professor J. N. Moorthy (CHM) is appointed the Director, IISER Thiruvananthapuram.
7 Professor Vinod Kumar Singh (CHM) has been elected as the President of the Chemical Research Society of India for next three years (2020-2023).
8 Dr. Purushottam Kar (CSE) is appointed as a Consultant at Microsoft Research India Ltd., Bengaluru.
9 Professor Malay Banerjee (MTH&S), has been invited to become an Associate Editor of the International Journal of Bifurcation and Chaos (IJBC), for a period of two years.
10 Professor Kamal Kar (ME and MSP) has been invited to join as the Editor-in-chief for a major reference book "Polymers and Polymeric Composites: A Reference Series having 20 volumes" by the Springer International Publishing AG.
11 Dr. Joydeep Chakraborty (PHY) has been recently selected to join Indian National Young Academy of Science (INYAS) for a period of five years with effect from January 2020.
12 Dr. Subramaniam Anantha Ramakrishna (PHY) is appointed the Director at Council of Scientific and Industrial Research-Central Scientific Instruments Organization, Chandigarh (CSIR-CSIO).

Editorships/Membership

1 Dr. Arun Shukla (BSBE) has been invited to join the Editorial Advisor Board of ACS Pharmacology & Translational Science.
2 Dr. Arun Shukla (BSBE) has been invited to join the Editorial Board of British Journal of Pharmacology.
3 Dr. Bushra Ateeq (BSBE) has been invited to join as Co-Editor-in-Chief of Translational Oncology, Elsevier.
4 Dr. Santosh Kumar Misra (BSBE) has been invited to join as Frontiers in Pharmacology: Xenobiotic Exposure and Predictive Toxicology, Frontiers.
5 Professor S.N. Tripathi (CE) has been invited to join the Editorial Advisory Board of Environmental Science & Technology Letters, American Chemical Society.
6 Professor Nihar Ranjan Patra (CE) became a member of Indian Geotechnical Journal, a Springer publication.
7 Dr. Raju Gupta (CHE) has been invited to join as an Editorial Board member of Scientific Reports, a Nature Research journal.
8 Professor Jayant K. Singh (CHE) has been invited to join the Editorial Board of Fluid Phase Equilibria.

9 Dr. Basker Sundararaju (CHM) became the Early Career advisory board member of ACS Catalysis, American Chemical Society.
10 Dr. Basker Sundararaju (CHM) has been invited to join as International advisory board member INEOS open access journal, Russian chemical society.
11 Dr. Basker Sundararaju (CHM) has joined as an Associate Editor of Journal of Heterocyclic Chemistry, Wiley publication.
12 Dr. Ritika Gautam (CHM) has joined as Review Editor of Inorganic Chemistry (specialty section of Frontiers in Chemistry Frontiers Media SA is a publisher of peer-reviewed open access scientific journals.
13 Dr. D.L.V.K. Prasad (CHM) has been invited to join as Member of Editorial Board Journal of Innovative Materials in Extreme Conditions, Serbian Society for Innovative Materials in Extreme Conditions, Belgrade University.
14 Professor Sandeep Verma (CHM) (currently on deputation as Secretary SERB), has been invited to become a Member, Governing Board, Indo-US Science and Technology Forum (IUSSTF), New Delhi.
15 Professor Debabrata Goswami (CHM) has been invited to join the Editorial Board of Science Advances as an Associate Editor.
16 Professor Sandeep Verma (CHM) (currently on deputation as Secretary SERB), has been invited to join as Associate Editor of Chemical Communications, RSC, UK.
17 Professor Sandeep Verma (CHM) (currently on deputation as Secretary SERB), has been invited to join as Member, Editorial Advisory Board of ChemBioChem, Wiley, Germany.
18 Professor Amalendu Chandra (CHM) has been invited to join as a Member, Editorial Advisory Board of Journal of Molecular Liquids, Elsevier.
19 Professor Vinod K Singh (CHM) has been the Editor of Tetrahedron Lett. since 2014, Elsevier.
20 Professor Vinod K Singh (CHM) has been invited to be the Member, Editorial Advisory Board of J. Org. Chem., ACS.
21 Dr. Kumar Vaibhav Srivastava (EE), has been invited to join the Editorial Board of Wiley Microwave and Optical Technology Letters (MOTL), a very prestigious journal in the area of Microwave and Optical Technology.
22 Professor Debajyoti Paul (ES) has been invited to be the member of Chemical Geology, Elsevier.
23 Professor Rajiv Sinha (ES) has joined as a Member of Editorial Board of Earth Surface Processes & Landforms, Wiley Interscience.

24 Professor Rajiv Sinha (ES) has joined as a Member of Editorial Board of Current Science, Indian Academy of Sciences, Bangalore.

25 Professor Ravi Priya (HSS) has been invited to serve as a member of the Indigenous Psychology Task Force of the Division 32, that is, Society for Humanistic Psychology of American Psychological Association.

26 Professor Sameer Chavan (Math) has joined as an Associate Editor of Indian Journal of Pure and Applied Mathematics, Springer.

27 Professor Avinash K Agarwal (ME) has been invited to join as Associate Principal Editor of FUEL, Elsevier.

28 Professor P. Venkitanarayanan (ME) has been invited to join as a Member of Editorial Board International Journal of Adhesion & Adhesives, Elsevier.

29 Professor P. Venkitanarayanan (ME) has been invited to join as a Member of International Advisory Board of Experimental Mechanics.

30 Professor Shantanu Bhattacharya (ME) has been invited to join as an Associate Editor of Journal of Micro-manufacturing, SAGE.

31 Professor Sameer Khandekar (ME) has been invited to join the Editorial Board of the International Journal of Thermal Sciences, as an Associate Editor.

32 Dr. Sudhanshu Shekhar Singh (MSE) has been appointed as a Member of Council, the highest decision making body, of the Indian Institute of Metals (IIM) for the year 2019-2020.

33 Professor Kantesh Balani (MSE) has been invited to join the editorial board of Journal of Materials Research, MRS Publishing.

34 Professor Kantesh Balani (MSE) has been invited to join as the Editor-in-chief of Nanomaterials and Energy, ICE Publication.

35 Professor Kantesh Balani (MSE) has been chosen for a key reader of Metallurgical and Materials Transactions A, Springer.

36 Professor Krishanu Biswas (MSE) has been invited to be a Guest Editor of Processing Challenges and Properties of Nanostructured High Entropy Materials, Journal of Materials Research.

37 Professor Amarendra K Singh (MSE) has been invited to be a Member of Editorial Board of Transactions of Indian Institute of Metals, Springer.

38 Professor Ashish Garg (MSE) has joined as an Associate Editor of Oxford Open Materials Science, Oxford University Press.

39 Professor Debashish Chowdhury (PHY) has been elected as a member of the council, the highest decision making body, of the Indian National Science academy (INSA), Delhi, for the three years 2020-2022.

40 Professor Sudeep Bhattacharjee (PHY) has been invited to join as an Editorial Board member of the Springer journal: Reviews of Modern Plasma Physics.

41 Professor Sudeep Bhattacharjee (PHY) has been invited to join as an Editorial Board member of Plasma Research Express, Institute of Physics (IOP).

42 Professor Sudeep Bhattacharjee (PHY) has been invited to join as an Associate Editor of Frontiers in Physics, Frontiers Media SA.

43 Professor Mahendra Verma (PHY) has been invited to join as Editorial Board Member of Europhys. Letters, Inst of Physics.

StudentAwards

1. Shribharat B (PhD/AE), Akhil B Krishna (PhD/AE) and Chirag Jain (MS/AE) were awarded support for DST-Lockheed Martin-Tata Trusts IIGP 2.0 - University Challenge 2019 at the ceremony held on 17th July 2019 at New Delhi. The program supported innovative technologies which had a strong potential for commercialization. The team had proposed solutions for Orbital Debris Mitigation for developing into a viable product.
2. Parvraj Pachore (MTech/EE), Yugal Gupta (PhD/EE) and Nachiketa Deshmukh (PhD/EE) were selected for IIGP 2.0 - University Challenge 2019. The program was to provide technical cum economical help and support to the teams with potential ideas for businesses. The team received a fund to develop and commercialize the product. The awards ceremony took place on 17th July 2019 at New Delhi.
3. Jitesh Kumar (PhD/MSE) received the Best Poster Award for his poster on "Alloying Effect of Al Addition on Microstructural Evolution and Mechanical Properties in EquiatomicCoCrFeMnNi High Entropy Alloy" in 26th International Symposium on Metastable, Amorphous and Nanocrystalline Materials (ISMANAM-2019) during July 8-12, 2019 organized by IIT Madras at Chennai.
4. Sabeeha Parveen (PhD/CHM) received the best poster award of ACS Omega at the “25th Chemical Research Society of India (CRSI) National Symposium in Chemistry”, during July 19-21, 2019, at IIT Kanpur.
5. AjithaprasadSreeprasad (PhD/PSE) received the Best Student Presentation Award in SPIE International Conference on Optical and Photonic Engineering (ICOPEN) 2019 organized during July 16-20, 2019 at Phuket, Thailand for presenting the paper: “A GPU Assisted Space Frequency Method for Dynamic Defect Detection in Optical Metrology”.

6. Tiasa Bal (PhD/HSS) was selected to attend the Bergen-Belsen International Summer School at the Bergen-Belsen Memorial (Anne-Frank-Platz, 29203 Lohheide, Germany) during August 03-14, 2019.
7. Poulami Nandi (PhD/PHY) received a Fulbright-Nehru doctoral award to spend 9 months at the University of California at Davis starting from March 2020. She was one of the two awardees (in the doctoral category) from Physical Sciences in the year. She also received a SERB Overseas Doctoral Fellowship for a 12 month stay at the Vienna University of Technology, Austria.
8. Juhi Srivastava (PhD/MSE) won second prize for student poster competition in the 5th World Congress on Integrated Computational Materials Engineering (ICME-2019 conference) held at Indianapolis, USA during July 21-25, 2019.
9. Meha Mishra (PhD/HSS) was awarded a research fellowship of three months to carry on her work at Department of Philosophy, University of Hamburg from October 1 to December 31, 2019 - along with a travel award to visit Hamburg. During her research visit, she worked on "Logic of conflicting obligations from the point of view of truth maker semantics".
10. Pankaj Singh (PhD/HSS) was awarded a research grant from Institute for Philosophy, Ruhr-University Bochum - for one month to visit University of Bochum and to work in the area of situated cognition. He also received a partial travel grant to participate in the summer school on "situated cognition" to be held in University of Bochum, Germany.
11. Prashant Kumar Varshney (PhD/EE) was invited to the 8th Asia Pacific Conference on Antennas and Propagation (APCAP) 2019 as an invited speaker and session chair. The conference was held at Incheon National University, Incheon, South Korea between August 4-7, 2019.
12. Nilesh Pandey (MTech/EE) was selected as a recipient of the 2019 IEEE Electron Devices Society Masters Student Fellowship - first time from India. He was one of the two students to receive this year's award among applicants from all over the world.
13. DhyananandYadaw (PhD/CHE) and Shalini Arora (PhD/CHE) won the third prize in New Generation Ideation Contest 2019 held at HPCL R&D, Bengaluru held with a motto to encourage students in India to come up with bright ideas to tackle modern world challenges such as clean and sustainable energy, environmental pollution and growing consumerism, etc.
14. Mr. Manmohan Vishwakarma (PhD/AE) received the "Young scientist attendance grant" for attending ICA-ASA-DEGA conference held in Aa-

chen, Germany during 9-14, September 2019. He was the sole winner from India selected for the grant.

15. Sakshi Goel (PhD/BSBE) received Scholar-in-Training Award from the American Association for Cancer Research (AACR)-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, Boston (October 26-30, 2019). This award recognizes outstanding young investigators presenting meritorious proffered papers at the American Association for Cancer Research Meetings. This award provides partial travel support for attending the AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, Boston.
16. Nishat Manzar (PhD/BSBE) received Women-in-Cancer Research (WICR) Scholar Award from the American Association for Cancer Research (AACR)-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, Boston (October 26-30, 2019). This award is given to women scientists-in-training, who are presenters of the meritorious scientific papers at the American Association for Cancer Research Meetings. This award partially supports her travel for attending the AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics at Boston.
17. Anukriti Singh (NDS/BSBE) received partial travel support from the Department of Biotechnoloy (DBT) to attend International Conference on Molecular Targets and Cancer Therapeutics, Boston (October 26-30, 2019). She presented her research findings on "MicroRNA-155 targets AGTR1/NF-κB /CXCR4 axis and attenuates oncogenesis in Glioblastoma".
18. Jawahar Sivabharathy (PhD/AE) 's article "Wake transitions and Laminar Separation Bubble in the flow past an Eppler 61 airfoil POF19-AR-01249R" was chosen to be promoted as an Editor's Pick in Physics of Fluids.
19. Vikram Soni (PhD/ME) received the Green Talents Award at the prestigious "Green Talents – International Forum for High Potentials in Sustainable Development" hosted by the German Federal Ministry of Education and Research (BMBF) to promote the international exchange of innovative green ideas.
20. Namrata Baruah (PhD/BSBE) received a travel award from the Bill & Melinda Gates Foundation to attend the 54th US-Japan Joint Panel Conference on Cholera and Other Bacterial Enteric Infections, to be held at Osaka, Japan during December 10-13, 2019. She presented a paper titled: "Formulation and Application of a Stable IpaC Vaccine Against Shigellae in a Mouse Model" at the meeting.

21. Vikas Vats (PhD/ES) received the best presentation award in the 2nd Triennial FIGA congress on 'Geosciences for sustainable development goals' held during October 13-16, 2019 in CSIR-NGRI, Hyderabad.
22. Narendra Singh (PhD/CHM) received the best poster award for his work titled "Peptide-Based Hydrogen Sulfide Responsive Nanostructures for Biomedical Applications" in XV JNOST-2019 conference, held at University of Delhi (October 18-21, 2019).
23. Nusrat Khan (PhD/BSBE) was selected to receive an American Society of Hematology (ASH) Abstract Achievement Award for her abstract titled “Suicide Gene Therapy with a CD33 Targeted AAV6 Vector Expressing an Inducible Caspase-9 Suicide Gene Is Therapeutic in a Xenotransplantation Model of Acute Myeloid Leukemia (#3351)”. The award supported her travel to the 61st ASH Annual Meeting and Exposition in Orlando, FL, taking place December 7-10, 2019.
24. Jayashree Majumdar (PhD/PHY) received a poster presentation prize in the 12th International Conference on Plasma Science and Applications (ICPSA 2019), held at the Department of Physics, University of Lucknow from November 11-14, 2019. The title of the poster was "Field emission properties of atomically heterogeneous metallic nanostructures created by microwave plasma generated low energy ion beams".
25. Prashant Kumar Varshney (PhD/EE) was awarded the Best Paper Award in the "2019 International Conference on Electrical, Electronics and Computer Engineering (UPCON)" held at the Zakir Hussain College of Engineering and Technology, Aligarh Muslim University, Aligarh from November 8-10, 2019.
26. Dr. Sahil Kalra (PhD/ME) was selected for the "IEI Young Engineers Award 2019-20" in Aerospace Engineering Division. The award was presented during the Inaugural Session of the 33rd National Convention of Aerospace Engineers held at Pune during November 16-17, 2019.
27. Vipul Bhatia (PhD/BSBE) received "Sun Pharma Science Scholar Awards-2019" in Bio-Medical Sciences category for excellence in original research work in Medical and Pharmaceutical Sciences.
28. Kartikeya Dixit’s (PhD/ME) was selected for the award of best conference paper in the 13th IEEE International Conference on Nano/Molecular Medicine and Engineering (IEEE-NANOMED 2019), held from November, 21-24, 2019 at Gwangju, Korea. The paper is on “Additively Manufactured Nanofiber Reinforced Bioactive Glass Based Functionally Graded Scaffolds for Bone Tissue Engineering"
29. Rashmi (PhD/MSP) had her work titled “Coherency and Lattice Misfit Strain Critically Constrains Electron Hole Separation in Isomaterial and

Heteromaterial Type-II Heterostructures" published as cover page article in The Journal of Physical Chemistry C (10.1021/acs.jpcc.9b08451).

30. Anamika (PhD/BSBE) received "Student Award" - 1st Prize, Parvaiz A. Shiekh (PhD/BSBE) "Student Award" - 2nd Prize, Namrata Baruah (PhD/BSBE) Best Poster Award - 2nd Prize at BioTERM2019 (International conference on Biomaterial-based Therapeutic Engineering and Regenerative Medicine) held at IIT Kanpur India from November 28 to December 1, 2019.
31. Sagar Paul (PhD/PHY) and Dr. Ganesh Kotagiri (PDF/PHY) received the "J. C. Bose Prize for Innovation in Method" for a poster presentation titled, "Magnetic reversal through vortex nucleation in a single magnetic nano-particle probed using Nb micro-SQUIDs in hysteresis free mode" at "National Conference in electron spectroscopy-2019" held in SNBNCBS, Kolkata during 26-29 Nov 2019.
32. Pravat Rajbanshi (PhD/CHE) received the Best Poster Award at "13th International Conference in Complex Fluid (CompFLu 2019)" held in IISER Bhopal during December 5 – 7, 2019 for his poster "Effect of Symmetry on fluid flow and mixing inside multi-helical microchannel" in Microfluidic Section.
33. Mayank Agarwal (PhD/CHE) received the Best Poster Award at "13th International Conference in Complex Fluid (CompFLu 2019)" held in IISER Bhopal during December 5 – 7, 2019 for his poster “Signatures of Overaging in Aqueous Dispersion of Carbopol” in nanomaterials section.
34. Khushboo Suman (PhD/CHE) received the Best Poster Award at "13th International Conference in Complex Fluid (CompFLu 2019)" held in IISER Bhopal during December 5 – 7, 2019 for her paper titled "A kinetic model for a sol-gel transition in a colloidal dispersion on nanopartiocles: Application of the Modified Bailey Criterion" in Rheology Section.
35. Gunjan Kholapure (MSR/CSE) won first prize in the Argoverse 3D tracking challenge. The winners were announced in the Thirty-third Conference on Neural Information Processing Systems (NeuRIPS 2019) ML for Autonomous Driving workshop which was held during December 8-14, 2019 at Vancouver Convention Center. He received an award and an internship at ArgoAI (a VW and Ford backed startup in the Autonomous Driving Space).
36. Siddhant Shrivastava (PhD/DP), Anubhav Mishra (PhD/DP) and Abhishek Verma (PhD/DP) were awarded the best paper award in the “FORE International Conference on Frugal Approach to Innovation (FICFAI) 2019” on December 13-14, 2019 held at FORE School of

Management, New Delhi. The title of the paper was "Frugal Innovation for Designing the Free Wheel Ratchet Based Differential System for Cycle Rickshaw".

37. Sucharita Maji, (PhD/HSS/Psy) was selected as a participant for the Emerging Psychologists' Programme of the International Congress of Psychology 2020 in Prague, Czech Republic (July 16th-19th 2020). The programme is designed for the selected aspiring and emerging scientists in psychology across the globe to facilitate international communication and networking.
38. Shashank Chaudhury (MDes/DP), Jyoti Pandey (MDes/DP), Shuki (MDes/DP), Omkar Lanke (MDes/DP) and Ashish Mishra (MDes/DP) won 1st Position at the “Secure Himalaya Hackathon" organised by "United Nations Development Programme”.
39. Nitish Kumar Gupta (PhD/PSE) won Best Poster Presentation Award in the "IEEE-Workshop on Recent Advancements in Photonics (WRAP)-2019", held at IIT-Guwahati during December 13-14, 2019. The topic of his presentation was "Information Encryption in Thermal Metamaterials through Emissivity Engineering."
40. Ashutosh Jena (PhD/ME) won the best paper award in engineering session of Fourth Sustainable Energy and Environmental Conference (SEEC-2019) held at NEERI Nagpur during November 27-29, 2019 for his paper titled “Combustion analysis using optical diagnostics”.
41. Utkarsha Sonawane (PhD/DP) won the best paper award in engineering session of Fourth Sutainable Energy and Environmental Conference (SEEC-2019) held at NEERI Nagpur during November 27-29, 2019 for her paper titled “Performance, combustion, and emissions from Gasohol fuelled SI engine”.
42. Anirban Banerjee (PhD/IME) won the 3rd prize under the category: Theory & Methodology during the recently concluded XXIII Annual International Conference of the Society of Operations Management (SOM 2019), held at IIT Kanpur, INDIA from December 19-21, 2019.
43. Harsh Chittora (BT-MT/EE) received the Best Poster Award at the International Workshop on the Physics of Semiconductor Devices (IWPSD 2019) held in Calcutta from December, 17-20, 2019. The topic of his presentation was "Equivalence between constant phase element and transmission line models in impedance spectroscopy analysis" and it was presented in the “Photovoltaics, Flexible and Organic Devices” poster session at the workshop.
44. Sadhana Naskar (PhD/HSS/FA) won a prestigious Certificate of Merit in the recent state-level art exhibition, Charukala Utsav organized by the Ministry of Information & Culture, Government of West Bengal in 2019.

Two of Ms. Naskar's recent paintings were selected for the final round (professional category) display of their annual exhibition at the Academy of Fine Arts Gallery, Kolkata.

45. Aditya Raj (BT-MT/CE) and Malik Faisal Nissar (BT-MT/CE) were awarded the First Prize in the National Student Award Competition for Civil/Structural Engineering Students for Best Innovative Structural Steel Design held during February 14-15, 2020 at the Institute for Steel Development and Growth (INSDAG), Kolkata.
46. Abhinav Bhardwaj (PhD/EE) was awarded the Second Best Paper Award in the URSI Regional Conference on Radio Science (URSI-RCRS 2020) held at the Indian Institute of Technology Varanasi (IIT BHU) from February 12-14, 2020 for his paper titled "Miniaturization and Enhancement of Out-coupled Power from a Waveguide filled with an Anisotropic Metamaterial.
47. Paramita Dasgupta (PhD/PHY) 's presentation at the "Young Scientists' Forum" of the "Moscow International School of Physics (Moscow ISP) 2020" was selected as the "Best Talk" by the committee. She received a Diploma for the best talk at the HSE study Centre, Voronovo, Moscow, Russia organized by P.N. Lebedev Physical Institute of the Russian Academy of Sciences. Her visit was funded by NASA.
48. Ankur Gupta (BT/EE), Nithya Muttineni (BTech/CSE) and Yash Varun (BTech/ME) secured the second place in the MHRD AICTE SAMADHAN competition in response to COVID-19. They proposed a user-friendly solution to fake-news detection on instant messaging and microblogging platforms.
49. Puja Sunil (PhD/AE) won 'Quantitatively Descriptive Flow Visualization Award' and first place in 'Quantitatively Descriptive Flow Visualization' category for her technical paper at 2020 AIAA AVIATION Forum.
50. Vishal Keswani (BS/ECO) and Sakshi Singh (BTech/CHE) won the first prize at FinSim Shared Task organized at Workshop on Financial Technology and Natural Language Processing (FinNLP). The research paper on the designed system was accepted at the conference and will be part of the proceedings.
51. Mohamad Aasif Bhat (PhD/EE) and AnteshwarChimadge (MTech/EE) won the prestigious Qualcomm Innovation Fellowship 2020 for their work in Wideband Delay Lines with Reduced Insertion Loss for Beamforming at mm-wave Frequencies.
52. Dhanajit Brahma (PhD/CSE) got selected in one of the eleven winning teams of the prestigious Qualcomm Innovation Fellowship 2020. His proposal was on the problem of "continual learning", where the goal was to enable deep neural networks learning to solve a sequence of

tasks in a way that, when learning to solve a new task, the neural network does not forget the knowledge acquired about solving previous tasks, a capability that is inherent to humans.

53. Priyanka Gupta (PhD/CHE) received the best oral presentation award in the recently concluded Chem-Conflux20 conference held at MNNIT Allahabad, Prayagraj. The title of her presentation was "Removal of Glyphosate from water by Catalytic Wet Air Oxidation using Fe Nanoparticles-dispersed Carbon Nanofiberous Activated Carbon Beads".
54. Swati Gupta (PhD/CHM) received the best oral presentation prize in Student Indian Peptide Symposium (sIPS-2020) held during February 20-21, 2020 in Madurai Kamaraj University, India. The topic of her presentation was "Biotransformation of 2,4,6-Trinitrotoluene by Diaphorobacter sp. strain DS2.
55. Anjali Sifar (PhD/CGS) won the Marr Prize 2020 for the best paper with a student as first author in the annual virtual meeting of the Cognitive Science Society held from July 29 – August 2, 2020. She won the prize for her paper "**Limits on Predictability of Risky Choice Behavior".**
56. Sarwar Nizam (PhD/ES) had his study selected to be on the front cover of the journal *Environmental Science & Technology (ES&T)*, an authoritative source of information for professionals in a wide range of environmental disciplines. The paper shows how the melting rates of western Himalayan glaciers are insensitive to fossil-fuel combustion residues, which is contrary to all recent findings.
57. Ekant Sharma (PhD/EE) won the Best Doctoral Dissertation Award (2019-20) at 13th International Conference on Signal Processing and Communications (SPCOM) held at Indian Institute of Science, Bangalore from July 19-24, 2020. Title of his thesis is Analysis and Optimization of Energy-Efficient Massive MIMO Wireless Relaying Systems.
58. Aditya Srivastava (BT-MT/EE) and GyanajyotiRoutray (PhD/EE) won the Best Student Paper Award at SPCOM 2019-20.
59. Tharun Kumar Reddy (PhD/EE), Madhurdeep Jain (BT/EE), Archit Bansal (BT/EE), Palashdeep Singh (BT/EE), Kushangi Mittal (BT/EE) and Madhurdeep Jain (BT/EE) as a team received 2nd position worldwide (team name: iBCI) in the Clinical BCI Challenge organized as a part of WCCI 2020.
60. Siddhant Shrivastava (PhD/DP) was selected for the "Gandhian Young Technological Innovation (GYTI) Award 2020", along with the research grant to take the product "Multipurpose Proctoscope" forward towards commercialization. The award function was held at Rashtrapati Bhavan, New Delhi.

61. Snehil Chandra (MTech/EE) and P Naga Yasasvi (PhD/EE) were selected as one of the Best papers at 2020 IEEE PES GM Session on August 3, 2020 for the paper titled Optimal Transmission Switching with Injection Uncertainties in the session titled Best Conference Papers on Planning, Operations, and Energy Markets.
62. I Avinash(PhD/CHM) was selected for S. S. Bhatnagar Young Scientist Award for his Oral Presentation at the International Seminar on “Recent Advances in Chemistry & Material Sciences (2020)” organized by the Indian Chemical Society. The title of his oral presentation was “Backbone Boron-Functionalized Imidazole Derivatives as Fluoride Sensors and as Ligand for Luminescent Copper Complexes”.

Major Projects Sanctioned

1. Energy Storage Platform On Hydrogen (DST)
2. Elucidating The Conformational Dynamics Of Non-Canonical Seven-Transmembrane Receptor Activation And Signaling (WT)
3. NIDHI-SSS (DST)
4. Developing Efficient Method For The Measurement And Characterization Of High-Dimensional Quantum States For Photonic Quantum Information (DST)
5. Single-Carrier Decoy-State Frequency-Coded Quantum Key Distribution Over 50 Km Optical Fiber (DST)
6. Chromium Isotopes As Tracers Of Environmental Contamination And Remediation (IFCPAR)
7. Center Of Excellence For Defense Corridor-Office Expenses (UPEIDA)
8. SPARC: Development And Neurological Application Of High Definition Fibre Tracking (HDFT) (MHRD)
9. SPARC: Developing Safe And Secure Autonomous Cyber-Physical Systems (MHRD)
10. Investigating The Molecular Mechanism Of Cartilage Segmentation During Early Chick Embryonic Development (DBT)
11. Improving Performances Of Power Electronic Circuits Using Gan-HEMT Devices (SERB)
12. India Agritech Incubation Network (Iain) (BMGF)
13. National Center Of Excellence In Geodesy (DST)
14. J C Bose National Fellowship (SERB)
15. Wind Tunnel Model Design, Fabrication & Testing Of Cruise UAV Variant (ADE)
16. SPARC: Adding Value To Additive Manufacturing-Advanced Characterization Of The Structure-Properties-Performance Of Ti6a14v (MHRD)

17. Development Of Multi-Functional Nano-Hap Bone Substitute For Effective Bone Regenration In Critical Defects (DST)
18. Programming Robots By Demonstration For Industrial And Warehouse Automation (TCS)
19. Design Of Flexible Sweat Sensors Snd Stretchable Batteries Embedded In E-Textile To Monitor Personal Health And Fitness Parameters (IFCPAR)
20. Gan Based High Power LNA For 5G Applications (IUSSTF)
21. PPP Mode Industry Projects (Prototype Development Fund) (STAMLO)
22. Robot Skill Transfer From Simulation To Real World Development In Manufacturing Industries And Warehouse (Translearn) (IGSTC)
23. Linear Scaling DFT (CDAC)
24. Establishment Of A State-Of-The-Art Facility For Design And Fabrication Of Medical Devices And Equipment With In House Quality Control System For Cultivating A Local Production Hub Of Medical Grade TE (BIRAC)
25. Pilot Project On Development And Implementation Of Industry 4.0 Protocols For Rail-Coach Design & Manufacturing At Modern Coach Factory, Raebarely (DST)
26. EMI/EMC And Electrical Safety Testing Facility, IIT Kanpur (BIRAC)
27. Unlocking Wastewater Treatment Water Re-Use And Resource Recovery Opportunities For Urban And Peri-Urban Areas In India (DBT)
28. Multiscale Microstructure Simulation And Modelling (CDAC)
29. Development Of A Vision Based Autonomous Quadrator System For Rescue And Search Operation (DRDO)
30. Development Of Integrated Dampers For Combustion Dynamics Abatement For Low Emission/Advanced, Biojet Fuel GT Combustors (SERB)
31. Complex Defense Object Recognition And Autonomous Handling In Unstructured And Noisy Outdoor Environment (Phase-I) (DRDO)
32. Investigation Of Wetting Behavior And Mobility Of Aqueous Drops On Lubricating Fluid Coated Slippery Surfaces (SERB)
33. Ultra-clean Emissions DME Fuelled Tractor Engine Prototype Development For Agricultural Applications (SERB)
34. Development Of TFT Array And Liquid Crystal Layer And Their Integration With Metasurface Antenna (ISRO)
35. RAA Labs for Samagra Shiksha Delhi (UEEM)
36. Synthetic Perspective Of Domino Ring-Opening Cyclization (DROC) And Ring-Opening Cyclization (ROC) Of Activated Aziridines And Azetidines To Various Bilogically Significant Aza/Oxa-Heterocyclic Compound (SERB)

37. Deciphering The Role Of Small Rnas In The Development Of Hemophilic Arthropathy And Formulation Of A Microrna Based Therapeutic To Alleviate Joint Damage (SERB)
38. Modeling The Nature Of Active Sites And The Role Of Support In Hydrodeoxygenation Catalyst (SERB)
39. Highly Efficient, Low Emission Gasoline Compression Ignition Engine Prototype Development (SERB)
40. In Union There Is Strength To Sense Mechanisms Of MTORCI Clustering On Lysosome For Nutrient Sensing And Their Implications In Diabetes Probed With Super-Resolution Microscopy (SERB)
41. Turbulent Jet Manipulation Using Unsteady Injection (SERB)
42. Robotics And Automation In Agriculture (MEITY)
43. Cyclic-Proatcs Triggered By Chemical Or Photocaged For Spatiotemporally Controlled Degradation Of Intracellular Proteins In Cancer (DBT)
44. One Symmetry To Rule Them All (SERB)
45. Controlling The Efficiency Of Molecular Switches And The Dynamics Of Switchable States On Surface (SERB)
46. Temperature-Sensitive TRP Ion Channels As Biological Thermometers To Gauge The Pain (DBT)
47. Nidhi Prayas-2020 (DST)
48. Hydrogenated Amorphous Silicon-Germanium Alloy Films For Enhanced Efficiency Of Thin-Film Solar-Cell Based On Cu2znsns4(CZTS) (SERB)
49. Tribe Connect: Integrated Smart Tribal Eco-Platform-A Proof Of Concept In Chattisgarh (MEITY)
50. Understanding The Self-Assembly Of Ampliphilic Molecules In Supercooled Solvents Using Molecular Simulations (SERB)

Labs/ Facilities Developed

1. Cell Sorting Facility (FIST) & High Throughput Sequencing Facility (FIST &India Alliance). PI: Bushra Ateeq (BSBE).
2. Tissue culture lab/In progress/ equipments: 1. O#P/BSBE/RD/2019-20/92/621//Biological Safety Cabinet; 2. PO#P/BSBE/RD/2019-20/93/622//CO2 Incubator (DBT). PI: Santosh K. Misra (BSBE).
3. Carbon nano-particle synthesis facility/MICROWAVE –UV-US SYNTHESIS/EXTRACTION SYSTEM WITH PRESSURISED REACTOR (Departmental Grant) PI: Santosh K. Misra (BSBE).
4. Aerosol Chemistry Laboratory in National Aerosol Facility (NAF) have been developed. PI: S. N. Tripathi (CE).

5. Drum composting facility created for biodegradable municipal solid waste management of IIT Kanpur campus from Institute funds. PI: A. Singh (CE).
6. GC-MS-TD established with funds from MOEFCC as part of ongoing NCAP (CE).
7. Development of Instantaneous Volumetric Velocity Measurement Facility for Complex Flow Under FIST/IRPHA. PI: A. K. Saha (ME)
8. High Temperature Lab under IMPRINT (MSE).
9. ICME National Hub. PI: Dr. Amarendra K. Singh (MSE).

Software Developed

1. Technology named Willbot: automated chatbot for delivery of cognitive behavioral therapy for depression developed (BSBE).
2. dbAQP-SNP: A database of single nucleotide polymorphisms in human aquaporins (BSBE).
3. TChemPy: A beta-version of python code have been developed to calculate the thermochemistry of molecules. The results using this software is published in Journal of Physical Organic Chemistry (2020: https://doi.org/10.1002/poc.4131) (CHM).
4. Development of Open Source Solidification/ Melting Platform-OpenSol (ME).

Technologies Developed

1. PIPES (Polyethylene-based Improvised Protective Equipment under Scarcity): a low-cost PPE kit for COVID-19. PI: N. Gupta (BSBE).
2. Sensor for black carbon determination of air sampler, patent # 292000 (26012018) India. Patent granted. (PI: T. Gupta) (CE).
3. Electrosurgical Cautery with Suction Inbuilt by Dr. Tarun Gupta (CE), Mr. Roshna Kumar (Student, CHM), Mr. Ankur Bajaj (Student, BSBE), Dr. Pooja Ramakant (KGMU), Dr. Kul Ranjan Singh (KGMU), Dr. Anand K. Mishra (KGMU), 320342-001 Date Of Grant 01/08/2019. Patent granted (CE).
4. NSVS- Autonomous Aquatic Observatory for river water monitoring. PI: B. Bhattacharya (ME).
5. Inkjet Printable Capacitors on Textiles/ Paper substrates: Supported through Department of Science and Technology, Technology Systems Development Platform, “Inkjet printed electrodes of Graphene oxide-Metal oxide hierarchical nanostructured nanocomposites for improved energy density and power density thin flexible supercapacitors”

Funded (Amount: 40,00,000 INR, USD $65625). PI: S. Bhattacharya (ME).

6. Early Dengue Detection Biochip through paper microfluidics: Supported through BIRAC, Department of Biotechnology, “Lateral Flow Immunoassay based Point-of- Care Diagnostic Device for Ultrasensitive Colorimetric Detection of Dengue “ Funded to TCIP a technology company incubated by PI Funded (Amount: 50,00,000 INR, USD 70,000). PI: S. Bhattacharya (ME).
7. Automated Stacking System for surgery blades supported by Kehr Surgical Instruments Ltd., “Design and development of a blade sorter system for high through segregation and stacking”, Funded (Amount: 7,00,000 INR, USD$9722). PI: S. Bhattacharya (ME).
8. Plasma assisted bonding process in thermoplastic and thermosetting composites for aerospace manufacture supported by Boeing Corporation, USA, “Joining Of Thermoplastic And Thermoset Composites”, Funded (Amount: 25,00,000 INR, USD$35000). PI: S. Bhattacharya (ME).
9. Gas sensor for Helium detection within Cyro Lab supported by ISRO, “Development of gas sensor to detect leakage of helium gas from inflatable space structures” Funded (Amount: 2000000 INR, USD$28000). PI: S. Bhattacharya (ME).
10. Developed a test facility called Acoustic Impedance Tube, which is used to measure the absorption and transmission loss of materials for acoustic waves. PI: Chandprakash C. (ME).

५३वाँ दीक्षान्त समारोह
53rd CONVOCATION