DIRECTOR'S REPORT

Honourable Prime Minister of India, Shri Narendra Modi ji, Prof Rohini Godbole, Shri Kris Gopalakrishanan, Pandit Ajoy Chakrabarty, Honourable Chairman, Board of Governors of the Indian Institute of Technology Kanpur, Dr K Radhakrishnan, Members of the Board of Governors, Members of the Academic Senate, all graduating students, members of faculty, alumni, staff, and the student community: I heartily welcome you all to the fifty-fourth 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 2020-21 ended in June 2021. Despite the shadow of the Second Wave of COVID-19 pandemic looming large, the session 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 of PhD degrees being awarded at this Convocation is 185. To encourage outstanding scholars to join the Doctoral Programme

directly after their Bachelors, the Senate approved the provision for an additional Masters 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 9 students are graduating in the third batch of MTech and PhD Joint Degree at this convocation.

In all, 1723 degrees are being awarded at this Convocation with the following details:

GRADUATION DATA

Degree	Number of Recipients
PhD	183
MTech-PhD (Joint Degree)	11
MTech	388
MBA	50
MDes	15
MS (by Research)	56
PGPEX-VLFM	36
MSc (2-yr)	143
Double Major	27
Dual Degree	136
MS-PD (MS part of the Dual Degree)	14
BTech	560
BS	104
Total	**1723**

In keeping with the flexibility that the IIT Kanpur academic Programme is known for, 33 students are graduating with two Minors whereas 149 students are graduating with one Minor. You will be delighted to know that 6 of the graduating students are graduating with 3 Minors. In all, 233 Minors are being awarded.

In addition, by spending one additional year at the Institute, 136 undergraduate students are graduating with a Masters degree along with their Bachelors while 27 of our undergraduate students are graduating with a Second Major. 9 of our postgraduate students are graduating with an additional Masters along with their PhD degree by doing additional credits.

Of the 827 students of the Bachelors and Bachelors-Masters dual degree programmes who are being awarded the degree today, 206 students are graduating with Distinction (CPI of 8.5 and above).

To keep pace with the evolving knowledge in science, technology, and other areas, 5 new undergraduate courses and 67 new postgraduate courses were approved by the Senate from October 1, 2020, to September 30, 2021.

It gives me great pleasure to share that the graduating students have been issued the degrees conferred at the 54th Convocation today through an in-house blockchain-driven technology developed at our Institute under the National Blockchain Project.

ACADEMIC INITIATIVES

The academic semester 2020-21-II was concluded under the shadow of a grave health crisis. In the wake of the COVID-19 pandemic, IIT Kanpur decided to shift all teaching to the remote mode without compromising on the quality of education. A pool of technical infrastructure as well as manpower resources have been created for this shift. The online platform, HelloIITK, powered by mooKIT, the home-grown platform for online pedagogy, has been made available for content delivery and assessments. In addition to this asynchronous content delivery platform, available videoconferencing platforms have been deployed for conducting lectures/tutorials in the synchronous mode. The institute has offered even some of the experimental laboratory courses remotely where pre-recorded videos of the experiments are shown to the students and the students are given access to laboratory data for post-experimental analysis. With a continuous evaluation mode already in place at IIT Kanpur, the transition to online assessments with weightages

distributed evenly across the various components of assessment has been seamless. In several courses, instructors have been employing the group assignment/exam technique to facilitate collaborative learning Although remote proctoring tools are being widely used for assessments, instructors have also been applying modes of assessment such as open-book questions, timed questions, randomized questions, and questions with student-specific numerical values. The *best-of-many* concept of assessments has been used to accommodate unforeseen impediments like power cuts, network failure, etc. during exams. In this remote teaching exercise, IIT Kanpur set for itself the goal of reaching the student to the last mile.

UNDERGRADUATE ACADEMIC REVIEW COMMITTEE (UGARC) 2020-21

As part of its decadal review of academic programs and associated curricula, IIT Kanpur has announced a comprehensive revamp of its curriculum, laying down a new template with path-breaking features. The transformative steps were part of the Undergraduate Academic Review Committee Report 2020-21 (UGARC 2020-21) that was approved by the IIT Kanpur Senate in its meeting held during October 6-7, 2021. The Institute already offers one of the most flexible academic programmes with options of Double Major, Minor and Dual Degree. The revamped curriculum will introduce new degree

options including the Honours degree and options of new inter-departmental degree programmes. It will also augment the scope of learning to include Social Sciences, Communication, Humanities, Economics, Management, and Environment (SCHEME). The Core Courses will be restructured to give greater flexibility to the core curriculum. Technology will drive teaching and pedagogy to take learning to the next level. Further, the program will also enable designated online courses done by students on MOOC platforms to be counted for credits. The transformational template for undergraduate education will include innovative and disruptive features such as new opportunities for student exchange across institutions for the Masters part of the Bachelors-Masters Dual Degree programme, direct admission for talented students via globally acclaimed Olympiads, academic credits for approved entrepreneurial activities and learning done in the industry set up, and an exit option degree for those students who want to leave the program in the middle.

STUDENT ENTREPRENEURSHIP POLICY

The challenges of modern industry require students to evolve from passive learners to creators and innovators. This requires universities to be venues where entrepreneurship is fostered in young people, a place where creative ideas spark that can lead

to innovations of the future, contributing to realizing India's real innovation and entrepreneurship potential. In view of the above, the Academic Senate of IIT Kanpur approved a comprehensive students entrepreneurship policy in August 2021 in line with the National Education Policy (NEP) and National Innovation and Start-up Policy (NISP).

The policy introduces the path-breaking concept of "Innovation and Entrepreneurship Credit", which will enable students to pursue their innovation and entrepreneurial aspirations as part of their academic journey while pursuing their degrees. The policy allows undergraduate students in 3rd year and postgraduate students immediately after completion of the minimum course work to gain academic credit while pursuing entrepreneurial activities. The students can also avail semester leave to pursue their ideas by using facilities both inside and outside the IITK campus. IITK's robust Students' Entrepreneurship Policy allows the students to keep pace with the demands of a rapidly developing world and provides a tremendous impetus to the vibrant entrepreneurship eco-system which already exists at the institute. The policy aims at promoting entrepreneurial spirit among students without diluting the academic standards and pedagogical goals. IITK takes pride to be one of the first Central Funded Technical Institutes to frame such a comprehensive policy.

NEW PROGRAMMES AND DEPARTMENTS

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

BS and BS-MS in Statistics and Data Science

IIT Kanpur is offering a new BS and BS-MS Programme in “Statistics and Data Science”. Like any other four-year BS or BTech Programme offered by the Institute, admissions to this new BS Programme will also be made through the Joint Entrance Examination (Advanced) conducted by IITs. The interface of Statistics and Data Science is a combination of theory and implementation of modern data, with immeasurable applications in industry, policy, and academia. This tight rope walk between theory and usability requires training specific to a unique set of skills which the new Programme is expected to impart at the undergraduate level.

eMasters Programme

The eMasters Programme offers an opportunity for IIT Kanpur to make an enduring contribution to the nascent ecosystem of online Programmes in the country. Rapidly evolving technology has given rise to new knowledge paradigms such as data science, cybersecurity, artificial intelligence, and finance,

among others. To be effective and remain relevant in the evolving scenarios, professionals are required to continually upgrade their knowledge and keep up with the latest developments in diverse fields. The eMasters Programme at the Institute has been designed to fulfil this requirement. The Programme is expected to help employed personnel from industry and various other backgrounds enhance their skill sets and improve their employability.

The eMasters Programme offers several flexible tracks, with multidisciplinary modules, to facilitate learning in the thrust areas listed below.

- Cyber Security to be offered by the Department of Computer Sciences and Engineering
- Communications Systems to be offered by the Department of Electrical Engineering
- Commodity Markets and Risk Management to be offered by the Department of Industrial and Management Engineering, and
- Power Sector Regulation, Economics and Management to be offered by Department of Industrial and Management Engineering

Department of Sustainable Energy Engineering

The new Department of Sustainable Energy Engineering is yet another milestone in IIT Kanpur's tradition of offering futuristic

Academic Programmes aligned with national priorities. This Department aims to contribute to national vision of energy sustainability by meeting a large proportion of energy needs through new and renewable energy technologies in future for its energy safety as well as for better well-being of citizens.

Accordingly, the vision of the department is to:

- offer high quality rigorous academic programmes in sustainable energy engineering with a paradigm shift in education by imparting sector-based education via appropriate blending concepts of several core disciplines,
- conduct cutting-edge research in frontier and futuristic thematic areas related to energy sustainability with clear thrust on new age technologies,
- carry out technology development leading to prototyping and commercialization of technologies,
- establish collaborations with national and global universities and industries creating a national and international presence,
- play a leading role in the creation of a technology development ecosystem in the country in sustainable energy engineering, and
- make a societal impact via technology demonstration and outreach programmes.

Key research domains of the department shall encompass energy capture and generation via solar, wind and other clean routes; energy storage and distribution via methods such as solar, hydrogen and electrochemical methods, smart grids, carbon capture, development of clean alternative fuels, water-to-energy, energy policy and economics, with scope to expand further as the department grows.

Department of Cognitive Science

The new Department of Cognitive Science at IIT Kanpur has emerged as a nucleus for inter-disciplinary research in the study of mind in the country. The department harnesses expertise of varied kinds to probe the following questions in an inter-disciplinary framework:

- Can a mind exist untethered to a physical brain?
- Which faculties of the mind are we born with, and which emerge through immersion in Society?
- How do the various cognitive modalities such as vision, language, reasoning, motor, etc. work together to give us a sense of seamless experience?
- Which cognitive deficits can be repaired, and how?

The department encompasses the richness and strength of bringing multiple perspectives to a single problem, ranging over philosophical argumentation, empirical inquiry in the laboratory,

theoretical and computational modelling, and translation to the real world. The graduating students of the department are expected to receive a well-rounded education and training in theoretical, computational, and experimental methods with the ability to pose and engage with stimulating questions in the study of the mind.

ON THE ANVIL

Department of Space and Astronomy

A Department of Space Science and Astronomy with a special emphasis on instrumentation, space exploration, and astronomical observations is in the process of being started. 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. The newly created department will complement, augment, and amalgamate expertise available in other departments in the institute, in particular the Physics, Aerospace Engineering, Mechanical Engineering, Electrical Engineering, Earth Science and Civil Engineering departments.

Department of Design

The existing Interdisciplinary programme of Design is being converted into a department. The creation of a department will expand our existing programme offerings, as well launch new ones including an undergraduate programme in Design. Further, the creation of the Department will be an enabler for qualitative and quantitative enrichment of our faculty expertise in design who come from diverse backgrounds such as biological sciences, civil engineering, computer science, design, economics, electrical engineering, graphics and media, management, mechanical engineering, and social sciences. The proposed Department of Design envisions itself as a multi-disciplinary space for design education, design research and innovation.

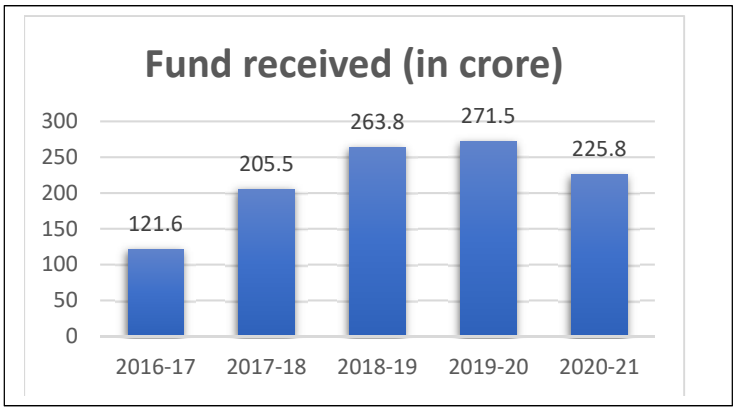
RESEARCH & DEVELOPMENT

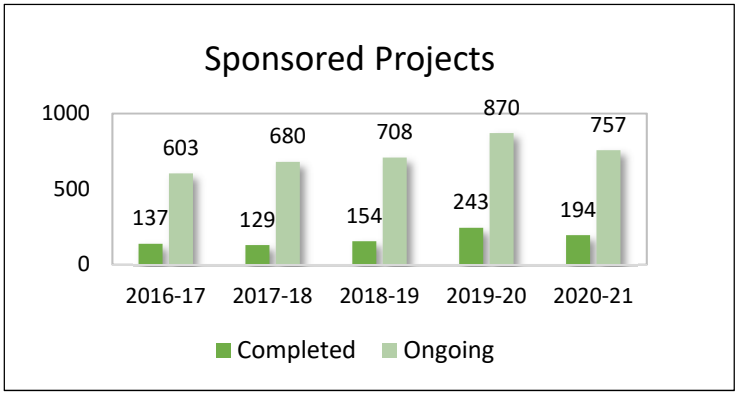
IIT Kanpur has registered steady growth in its research and development activities this year. Some of the highlights of the year 2020-21 are mentioned below:

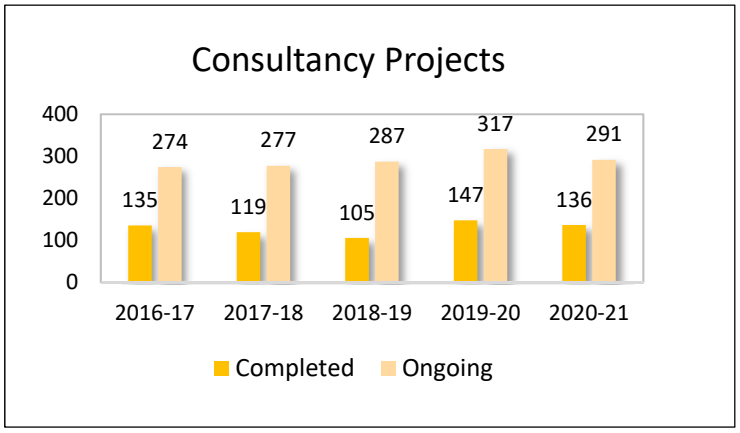
- 1145 externally funded ongoing projects with a total sanctioned amount of Rs. 1263.30 crore.
- 191 sponsored projects got sanctioned worth Rs. 147.09 crore.
- 128 consultancy projects got sanctioned of Rs. 30.986 crore.

- Total funds received for sponsored projects are Rs. 204.2 crore and the funds received for consultancy projects are Rs. 21.55 Crore.

Research over last 5 years – a summary







LEADING FUNDING AGENCIES OF THE YEAR

	Science & Engineering Research Board	Rs. 54.49 cr
	Department of Science and Technology	Rs. 23.41 cr
	Department of electronics and information technology	Rs. 20.19 cr
	Indo-US Science and technology forum	Rs. 13.83 cr
	Ministry of Human resources and development	Rs. 11.02 cr
	Ministry of Water Resources	Rs. 9.60 cr
	UEE Mission-Education Department, Delhi Government	Rs. 8.09 cr
	Space Technology Cell	Rs. 5.40 cr
	Wellcome-DBT Alliance	Rs. 4.81 cr
	CDAC	Rs. 3.72 cr

LEADING FUNDING INDUSTRY PARTNERS

MAJOR PROJECTS SANCTIONED

Some of the major projects sanctioned in 2020-21 are briefly described below.

C3i Hub (Cyber Security & Cyber Security for Cyber Physical System Innovation Hub)

C3ihub was created under the National Mission of Interdisciplinary Cyber-Physical Systems (NM-ICPS) under the Department of Science and Technology, Government of India. C3ihub aims to address the issue of cyber security of cyber physical systems in its entirety - from analysing security vulnerabilities and developing tools to address them at various levels of system architecture, to translating these tools to deployment-ready software, to nucleating start-ups developing these tools at scale, to partnering with industries in this domain and co-development and transfer of these technologies, to

training the next generation of cyber security researchers and professionals.

C3ihub at IIT Kanpur has already well-developed components to enable above activities. These include a Center for Cyber Security of Critical Infrastructure (C3i), an Incubation Center (as a Section 8 company), a Technopark enabling industry collaborations (as another Section 8 company), and a media center that has expertise in developing MOOCs and other online courseware. The Hub will support security research and development at institutions across the country, with three collaborating partners already on board (IISc Bangalore, IIT Kharagpur, and IIITA Prayagraj) to help substantially at the various layers where they have the right expertise. Foreign collaborators will also have substantial impact on the research agenda. The industry partners will provide the pathway to

understanding the industrial needs, as well as in some cases productization of the developed tools and provide services based on the methodologies and standards developed.

School of Medical research and Technology (SMRT)

SMRT is a game changing and ambitious initiative of IIT Kanpur to leapfrog into global leadership position. SMRT will be a multidisciplinary school working in collaboration with the Departments of BSBE, Mechanical, Electrical, Computer Science, Material Science, Chemistry, Chemical Engineering. The school will have nine advance research centers including AI in diagnosis, cancer research, Orthopaedics and Prosthetics, Vaccine, and drug development etc. and will collaborate with existing centers of Flexible Electronics, Cybersecurity, Nanoscience etc.

The SMRT spread over 25-acre campus, will constitute Academic building, a well-equipped library, student dorms, a super specialty hospital etc. Therefore, SMRT is a blue ocean strategy of IIT Kanpur to join the league of global universities like MIT, Stanford, and Harvard. It is a unique and the only initiative of its kind in India combining advance research in Engineering with Medical Sciences. The establishment was initiated by Micky and Vinita Pant Charitable foundation with a donation of 2.5 million US Dollars. Other donors include: Rural electrification

corporation (Rs. 15 Crores), JK cements (Rs. 60 Crores), and IBM (Rs. 37 Crores).

Design and Develop Indigenous Tactical UAV with Maximum Local Content through Collaboration between the Parties funded by BEML Limited:

In this project, a Medium Altitude Tactical Reconnaissance Unmanned Aerial Vehicle is being designed and developed. The UAV being designed is of medium weight class, with a maximum take-off weight of 30 kg and will possess short take-off and landing capabilities. Powered with a hybrid power plant with a military grade engine, this UAV will achieve 8+ hours of endurance, with a service ceiling of 5 km and a maximum speed of 40 m/s. The craft will be structurally robust to handle 3G manoeuvres and will be equipped with state-of-the-art surveillance

systems. Safety of the UAV against mission failure due to aerodynamic loss of control will be ensured through a robust autopilot, while its security of ownership against any possible breach of datalink by adversaries will be assured through systems jointly developed with C3i lab, IIT Kanpur.

Realizing Large-Scale and Fully Autonomous UAV Swarms funded by Science and Engineering Research Board:

Rapid advances in low-power processors, miniaturized sensors, low-cost manufacturing systems, and artificial intelligence (AI) algorithms are transforming the Unmanned Aerial Vehicle (UAV) landscape worldwide. With the advent of low-cost UAVs, we are already witnessing early attempts at the development of fully autonomous swarms, where multiple UAVs collaborate and coordinate among themselves to autonomously map and

navigate complex and uncertain environments, exhibiting emergent behaviour. Notwithstanding the promise of such large-scale swarm systems, several research problems remain to be completely addressed. These include need for a locally sourced platform, an end-to-end autopilot software, capability to deal with dynamic and uncertain environments, robust and persistent communications, and GPS-free operation. This project aims to resolve all these issues simultaneously, culminating in the development of a truly autonomous and intelligent multi-UAV swarm with self-learning capabilities

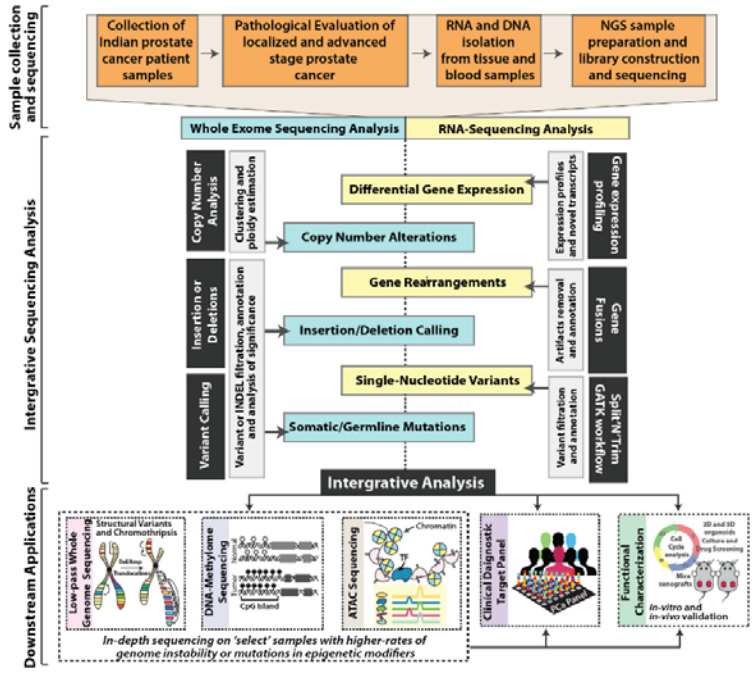
Creation of Science and Technology Content for Indic Wikipedia by IIT Kanpur funded by Department of Science & Technology:

With the rapid penetration of mobile phones in India and availability of Indian language tools, the importance of Wikipedia in Indian languages has grown manifold. Unfortunately, the quality and quantity of technical content (in the areas of science and technology) in Wikipedia of Indian languages (including Hindi) leaves a lot of scope for improvement. Thus, while building high quality science and technology content for the Hindi Wikipedia is the primary goal of the project, a more important aim is to inculcate the culture of scientific writing in Indian languages across the country. The

project will involve other institutes such as IIIT Hyderabad, CDAC and Wikipedia India.

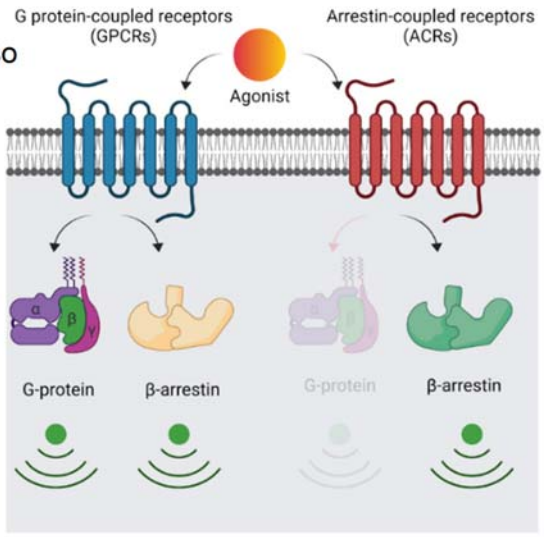
Integrative Molecular Profiling of Prostate Cancer: Identification of Molecular Signature for Risk Stratification and Advanced-Stage Disease Management funded by DBT/Wellcome Trust India Alliance:

This project aims to identify the gene aberrations prevalent in Indian prostate cancer patients, and explore their functional relevance in disease advancement, and drug-resistance. Using integrative genomics and functional-genomics approaches, our



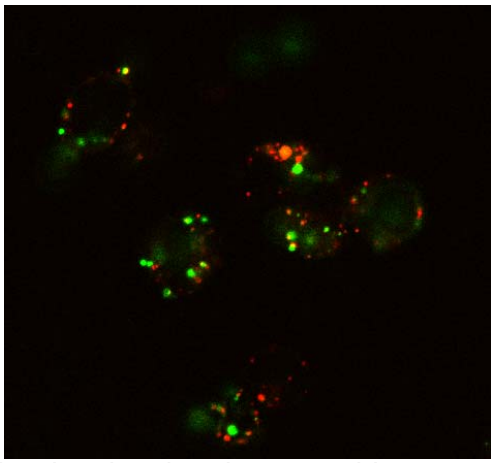
goal is to identify actionable driver alteration(s), which will provide a solid framework to introduce precision medicine for prostate cancer. Overall findings from this project will further propel prostate cancer research into the genomic and precision medicine era that would transform our understanding of this disease and would foster development of invaluable tools to enable future therapeutic management.

Understanding the Structural and Functional Diversity in Gpcrbetaarrestin Interaction and Signalling funded by DBT / Wellcome Trust India Alliance:



G protein-coupled receptors (GPCRs), also known as seven transmembrane receptors (7TMRs), constitute a large family of cell surface proteins in our genome. They are expressed in various cells and tissues of our body, and perceive an incredibly diverse range of signals including hormones, lipids, and metabolites. Nearly every aspect of human physiology including memory, cognition,

behaviour, cardiovascular regulation and immune response is governed by these receptors making them one of the most sought-after targets for modern medicine. Although majority of signalling and regulatory paradigms are conserved across different receptor systems, there is also clear evidence for receptor-specific, tissue-specific, and context-specific diversity in their signalling and regulatory paradigms. In this project, we aim to visualize the intricate details of how these receptors crosstalk with their downstream signal-transducers such as G-proteins and β-arrestins. We anticipate that such insights will help in designing novel therapeutics with minimized side-effects for various human disorders.



Imaging Coronavirus Spike(S) Mediated Membrane Fusion During Entry at Single-Molecule Resolution funded by DBT / Wellcome Trust India Alliance: Novel coronavirus has been found to be genetically closely related to the several bat coro-naviruses and severe acute respiratory syndrome coronavirus (SARS-CoV). Surprisingly, SARS-CoV-2 appears much more

infectious in terms of human-to-human transmission, compared to the SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), leading to the declaration of public health emergency**.** Given SARS-CoV-2's high pathogenicity, ease of air borne transmissibility and emergence of new variants allowing immune evasion, raised the alarm for prolonged pandemic of novel coronavirus. Therefore, understanding SARS-CoV-2 entry mechanism at molecular level is essential for producing effective vaccine and therapeutic developments for restricting COVID-19 infection.

In this context, IIT Kanpur is working to establish a single molecule imaging platform to directly visualize the Virus Spike protein dynamics during membrane fusion for cellular entry in the context of a single Spike trimer in real time, on the surface of SARS-CoV-2 S pseudo virions. The single molecule imaging at high spatial and temporal resolution will provide unprecedented details of Spike protein dynamics, mechanism of membrane fusion and key functional conformational states of Spike for SARS-CoV-2 entry into host cells. The research will help to understand how SARS-CoV-2 enter cells and also facilitate the design of structure dynamics-based therapeutics against COVID-19.

Food Insecurity, Intra-household Dynamics, and Life-course Outcomes funded by UK Research and Innovation (UKRI) in collaboration with the Lancaster University, and the Imperial College London (the UK):

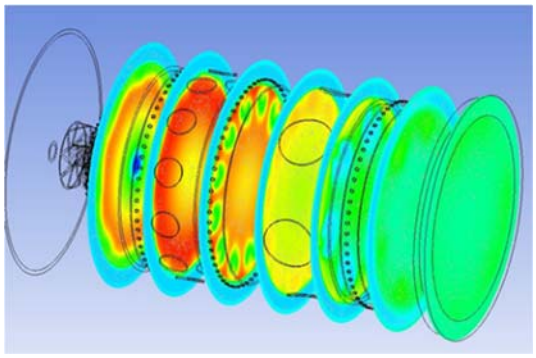
Employing a mixed-methods approach including quantitative and qualitative data from both primary and secondary data, the project will focus on measuring intra-household dynamics in access to food and various resilient strategies to effectively mitigate the negative effects of food insecurity in low- and middle-income countries, with special focus on India, Ethiopia, Peru, and Vietnam.

Experimental Investigations of Early Transition in Viscoelastic Channel Flows funded by Science & Engineering Research Board:

The onset of the transition from laminar to turbulent flows in pipes and channels has attracted the attention of engineers and physicists for the last century or so, ever since the discovery of the phenomenon in the case of pipe flow by Osborne Reynolds in 1883. While the experiments of Reynolds and several subsequent studies have focused their attention on the transition in the flow of Newtonian fluids (e.g., water, air etc.), the focus of this project is on the transition in the flow of viscoelastic polymer solutions. The transition in viscoelastic fluids has attracted recent attention due to the possibility of the onset of turbulence at

Reynolds numbers much lower than the Newtonian threshold. Here, we plan to carry out experiments to characterize the transition in rectangular microchannles of relevance to microfluidic devices.

Design, Development, Testing and Evaluation of a Lean Premixed Swirl-Stabilized Gas Turbine Combustor for Stationary Power Generation using High-Hydrogen-Content Fuel funded by Department of Science & Technology:



In this project, an indigenous lean premixed (LP) gas turbine combustor will be designed and developed for stationary power generation based on high-hydrogen-content (HHC) fuels. Besides fuel-flexible operation, the LP combustor is expected to reduce NOx and other harmful contaminants. Initially, a lab-scale LP combustor will be designed and developed. Experiments will be conducted to study the lean blow-off limit and flashback phenomena under various operating conditions. Simultaneous measurement of the flow field and flame is expected to reveal highly complex and

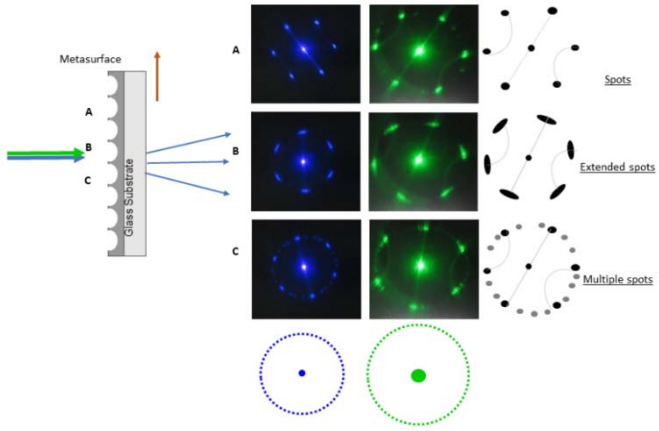
nonlinear interactions between turbulent flow and chemical kinetics in turbulent flows. Simultaneous high-speed particle image velocimetry (PIV) and OH - planar laser-induced fluorescence (OH-PLIF) measurements will be performed on the model GT combustor to obtain physical insights on the influence of turbulence on local flame characteristics. Finally, based on the above studies, an LP combustor for 100 kWe MGT will be designed, developed, integrated, and tested with a 100 kWe MGT.

Photonic metasurfaces for applications in diffraction and imaging funded by Science and Engineering Research Board:

Photonic metasurfaces are made of transparent materials and contain sub-wavelength patterns that modify the characteristics of light propagation in an exceptional manner. These can work in reflection/transmission modes, in spatial/spectral domains, and change the optical phase/amplitude/polarization, based on their design features. Some of the work done so far range from anti-reflective ‘skins’ suitable for enhancing the efficiency of photovoltaic devices, superhydrophobic surfaces, diffractive surfaces for wide angular spread of light, and surfaces for selectively modifying the radiation characteristics of antennas (in

GHz range). The targeted applications in this project are in spatial mode filtering, diffraction control and enhanced imaging.

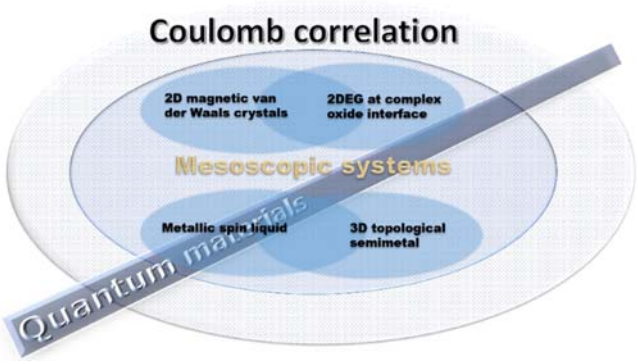
Nano Devices with Correlated Quantum Materials funded



by Department of Science & Technology:

The conceptual framework underpinning condensed matter physics is quantum mechanical. However, there is a large class of `quantum materials' which support a plethora of energetically close ground states, allowing quantum fluctuations to induce transitions between distinct phases. Experimental realization and tuning of such quantum phases are the principal challenges of modern physics. In addition, the extreme sensitivity of such phases to external stimuli holds potential for *new generation of devices with novel functionalities*. The major objectives of the project are, fine tuning of quantum phases close to quantum

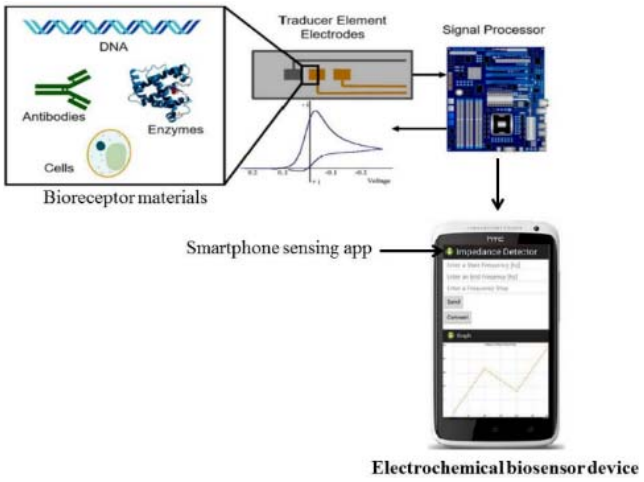
criticality. Fabricating these materials in confined geometry will itself act as control parameter and lend itself easily to non-thermal tuning. We shall also utilize other external stimuli such as magnetic field to study the quantum phases at ultra-low temperature using electrical transport measurements and Fabricating nano-scale devices based on correlated quantum and topological materials with enhanced functionality.



Development of Electrochemical Biosensors for Detection of Emerging Pollutants in Water funded by Department of Science & Technology:

Environmental deposition of synthetic, pharmaceutical, and natural chemicals with estrogenic activities has become a critical subject of global concern. These chemical species have properties of endocrine-disrupting compounds (EDCs) that interrupt the endocrine system and produces unhealthy

variations in both humans and organisms in the ecosystem. The relative persistence and lipophilicity of these pollutants enable their biomagnification and bioaccumulation within the environment, thereby leading to endocrine disruption. Due to this ubiquitous persistence, toxicity and distribution effects caused by estrogens, it is of prime concern to illuminate their behavior for controlling and assessing environmental risk. Thus, this project is aimed to develop smart phone based-electrochemical biosensors for analyzing steroid drugs especially hazardous estrogens (estrone E1, estradiol E2, estriol E3) and anti-estrogens (Bisphenol A) which can be easily applicable for domestic use as well as industrial purpose for monitoring of water samples. As shown in Figure below, the developed sensing system can analyse the results in a few minutes with added advantages of throughput processing,



Electrochemical biosensor device

improved quantification limits, reduced sample and reagent volume, enhanced sensitivity of detection and common platform for both sampling and detection. Overall, the combination of electrochemistry with biochemistry will provide new insight to better understanding of the interaction between steroids and bioreceptor materials.

Prototype Development and Experimental Investigations of CNG Fuelled Direct Injection Spark Ignition Engine funded by Department of Science & Technology:

Natural gas is considered as excellent alternate fuel due to its clean-burning characteristics and extensive availability. Its higher-octane rating enables use of higher compression ratio, hence higher thermal efficiency of the engine. However, main drawback remains is the power loss due to lower volumetric efficiency and lower flame speed compared to gasoline. In this

project CNG is used in a dual-fuel mode in direct injection spark ignition (DISI) engine, where a large fraction of energy is supplied by port-injection of CNG and remaining by direct-injection of gasoline. It helps in reducing in particulate emissions from DISI engines as well. The objective of this project is to assess feasibility of CNG-gasoline in dual-fuel mode in Direct Injection Spark Ignition (DISI) engine.

ICMR- DHR-COE Medical Research and Innovation

The Indian Council of Medical Research (ICMR) has joined hands with Indian Institutes of Technology ((IITs)) to establish “ICMR at IITs" by setting-up Centres of Excellence (CoE) for Make-in-India product development and their commercialization in medical devices and diagnostics space. In this regard, a project has been sanctioned for 15.07 Crores for three years by ICMR to Centre for Excellence, IIT Kanpur. The setting-up of the “ICMR at IITs" will bridge the gap in the technology development and commercialization cycle for a larger public health impact. It will also create a pipeline of innovative medical devices, start-ups and will incentivise and motivate local manufacturing in India and provide holistic support to the technologies/ products nearing commercialization. As most of the medical devices available in India are not affordable, the philosophy behind the scheme is to develop “more for less for more" to ensure wider product outreach with a mandate to promote

“Global Affordable Need Driven Healthcare Innovation" (GANDHI). This will have significant impact on improving access to affordable quality healthcare, particularly for middle- and lower-income segments of the Indian population.

School of International Biodesign-Synergizing Healthcare, Innovation and Entrepreneurship (SIB-SHINE)

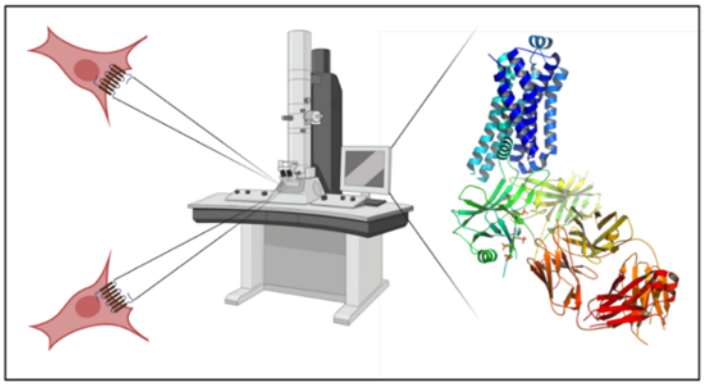
King George’s Medical University (KGMU) and Indian Institute of technology Kanpur will soon be getting together to set up a special institute for biomedical innovation, design and entrepreneurship. The Union government’s biotechnology Department has approved the collaborative project of the two premiere institutes, making it one of its kind in U.P. Called the School of International Biodesign-Synergizing Healthcare, Innovation and Entrepreneurship (SIB-SHINE), the institute will train 50 doctors and engineers in the next five years, and offer a one-year fellowship.

List of major projects sanctioned are listed at the end of this document.

RESEARCH INFRASTRUCTURE

SERB sponsored National Cryo-Electron Microscopy Facility at IIT Kanpur

Membrane proteins constitute approximately one third of the total cellular proteome, and they are involved in nearly every biological process making them one of the most important class of drug targets. High-resolution structure determination of membrane proteins continues to be one of the most challenging but incredibly rewarding research areas in modern biology. Despite an illustrious history of Indian structural biology fraternity, direct structural studies of membrane proteins in India have mostly been an untouched territory, resulting in a significant lack of Indian presence at the global arena in this area. In this backdrop, the current project aims to establish SERB supported National CryoEM facility at IIT Kanpur focused on structure determination of therapeutically important membrane proteins



at high-resolution. This will serve as a springboard for our research program to reach the next level and multiply the impact of research outcomes with direct implications for novel drug discovery. It is envisioned that the CryoEM facility at IIT Kanpur will serve as the North India hub for users from multiple institutions and industries who are interested in using structural biology as a gateway to understanding fundamental biological processes and leverage the information designing novel therapeutics. This facility will also be a platform for training the next generation of scientists i.e., graduate students and post-doctoral fellows, in this incredibly powerful technology

PARAM SANGANAK Facility

IIT Kanpur and CDAC signed an MoU to establish a 1.3 Peta FLOP supercomputing facility at Indian Institute of Technology Kanpur under the National Supercomputing Mission (NSM). The mission is steered jointly by the Ministry of Electronics and Information Technology (MeitY) and the Department of Science and Technology (DST).

Under this mission, it is proposed to create a family of supercomputers of varying compute capacities to solve problems of

national and global relevance. Supercomputing infrastructure, applications development, research & development, and the human resource development are the four pillars of the mission.

Central Experimental Animal Facility (CEAF)

CEAF is one of the first such facility in all IITs, which provides technical support and infrastructure facilities to R&D programmes pertaining to animal research.

National Aerosol facility (NAF)

The National Aerosol Facility is a multipurpose facility for studying the aerosol behavior under simulated severe nuclear reactor accident conditions, established at IIT Kanpur. During a severe accident in nuclear power plants fission products are expected to be released in the form of aerosol particles and droplets from the degraded core. Understanding the release, transport, and retention of these fission products in the reactor system components is a fundamental step towards quantifying the amount of radioactivity which could make its way to the environment. The aerosol behaviour in the primary heat transport system and in the containment system under dry as

well as wet atmospheric conditions is crucial research area for nuclear safety.

Shivani Centre for the Nurture and Re-Integration of Hindi and Other Indian Languages at IIT Kanpur

In a path-breaking initiative, IIT Kanpur announced setting up of a Centre aimed at a seamless integration of students from Hindi and Other Indian Languages (OILs) background in the socio-academic milieu of the prestigious institute. This center has been set up for students from across the country with a non-English medium of instruction at school. The newly-instituted Shivani Centre for the nurture and re-integration of Hindi and other Indian languages will ensure availability of the course content in regional languages to overcome the challenge of re-stricted job opportunities at the end of the academic program. The Centre is being established with a grant of USD 1 million from Micky and Vinita Charitable Foundation. Our alumnus Mr. Muktesh (Micky) Pant (BT/CH/76) is setting up this Centre in the memory of his late mother Smt. Gaura Pant better known as Shivani. She is an institution in Hindi literature and is considered as one of the most popular Hindi writers of the 20th century. She was awarded Padma Shri by the Government of India for her contribution to Hindi literature in the year 1982.

Chandrakanta Kesavan Centre for Energy Policy and Climate Solutions

In light of the growing importance of sustainable energy and climate change, the centre will promote and develop appropriate technology and policy solutions to help India and the world combat & address challenges in energy and climate change. The centre's broad aim is to develop low carbon solutions, provide the knowledge to build an appropriate policy framework, and engage with various stakeholders to help mitigate the challenges caused by climate change towards attaining sustainable living. The center will be anchored in the Department of Sustainable Energy Engineering, IIT Kanpur. It will work towards making IIT Kanpur to be carbon neutral over the next few years. IIT Kanpur alumnus, Mr Sudhakar Kesavan (BT/CHE/76) and his wife, Ms Alka Kesavan, have contributed USD 2.5M for supporting the "Chandrakanta Kesavan Centre for Energy Policy and Climate Solutions" at IIT Kanpur

INNOVATION & INCUBATION

During the year 2020-21, 61 IPR's were filed by the Institute including 49 Patents, 7 Design Registration, 4 Trademarks and 1 Copyright. 59 previously filed IPRs were granted and 4 technologies were licensed to industry partners.

Till date, 744 IPRs have been filed, out of which 264 have been granted so far along with 116 technologies licensed for commercialization. An amount of Rs. 67,16,000 was generated from licensed technologies for the year 2020-2021.

A total of 106 companies are currently incubated at Startup Incubation and Innovation Centre (SIIC), IIT Kanpur and 66 have graduated so far.

Foundation for Research & Innovation in Science & Technology (FIRST) IIT Kanpur's vision for Atmanirbhar Bharat

FIRST aims to turn India into a self-sustainable powerhouse of quality healthcare equipment developed indigenously. FIRST harbours a vision of making India a self-sustainable hub of manufacturing. The incubator has led its companies towards addressing pressing Covid-19 challenges from both preventative and critical care perspectives. The innovators offer an integrated set of end-to-end industrially scalable and commercially viable solutions to deal with various challenges at every stage of the COVID-19 pandemic.

Some of the key innovations led by FIRST have been:

Noccarc V310 (Noccarc Robotics)

Noccarc V310 is an advanced, indigenous, safe, reliable, and clinically validated ICU ventilator developed by Noccarc Robotics under the technical guidance of FIRST IIT Kanpur. V310's turbine-based technology eliminates compressed medical air requirements and allows the V310 to be used in several infrastructural setups.

Swasa N-95 mask (E-Spin Nanotech)

An E-Spin nanotech product, Swasa N-95 masks, have been developed under the leadership of Dr. Sandip Patil, an IIT K alumnus and founder of the company. The leak-proof masks offer comfortable breathing, 99.99% protection against viruses and bacteria, and ergonomic design.

Suraksha Kit (Aarna Biomedical)

Designed with the purpose of 'protecting the protectors,' the Suraksha Kit is a composite PPE Kit that includes overalls that combine virus permeability and breathability. The design ensures optimal air exchange for maximum comfort.

Mission Bharat O_2 (MBO_2)

FIRST, IIT Kanpur launched the Mission Bharat O_2 in May 2021 to address India's oxygen crisis, with an overarching objective of promoting indigenous manufacturing at par with global standards. Mission Bharat O_2 is a step towards the larger vision of FIRST to nurture a self-sustainable healthcare system in India. FIRST, IIT Kanpur provided technical support for designing and developing oxygen concentrators and oxygen plants of 250 LPM and 500 LPM capacities to selected manufacturers across India. A FIRST-incubated company, AquaInfra (AIPL), provided the design for product development and manufactured oxygen plants across India.

Other Achievements

- FIRST collaborated with two international organizations towards establishing a global footprint. In March 2021, FIRST & Singapore Indian Chamber of Commerce and Industry (SICCI) signed an MoU to open a gateway of

opportunities for tech-based start-ups across borders. In October 2021, FIRST signed an MoU with the Canada-based Toronto Business Development Centre (TBDC) to provide qualifying start-ups incubation and a chance to relocate to Canada.

- FIRST is implementing the Tech for Tribals program, which is supported by the Tribal Co-operative Marketing Development Federation of India (TRIFED) under the Ministry of Tribal Affairs. Under the same, FIRST won the “Best Entrepreneurial skill training projects” during TRIFED’S 1ST ANNUAL Vandhan Awards.
- FIRST-incubated company, Phool.co that makes natural incense and bio-leather from flower waste coming from temple raised investment from acclaimed celebrity, Alia Bhatt.
- FIRST-incubated company, Noccarc Robotics Private Limited won the award for the Tech Solution of the Year: COVID-19 at The Economic Times Healthcare Awards 2021.
- Sri Sri Rural Development Program signed MoU with FIRST IIT Kanpur to facilitate entrepreneurship through joint efforts.
- FIRST organized the incubator’s annual showcase event Abhivyakti from 16th to 18th December 2020. The event saw an illustrious line-up of speakers and startups

and brought informative, engaging, and pathbreaking conversations putting innovation at the heart of the matter.

The way forward

The FIRST IIT Kanpur legacy of delivering purpose with profit stands true to its ground in the global health emergency. The true spirit of innovation lies in the innovator's ability to adapt to the dynamic demands of the ecosystem. The COVID-19 pandemic has allowed the FIRST ecosystem to capitalize on the untapped potential of the local manufacturing landscape to answer India's healthcare needs. As the Covid-19 pandemic becomes history, India will continue to rely on local manufacturing as the new normal.

Research and Technology Park Foundation

With the intent of boosting and accelerating long-term strategic R&D collaborations between industry and IITK faculty and students, the IIT Kanpur Research and Technology Park Foundation was set up in February 2019. The section 8 not-for-profit company that functions under the brand name of Technopark@iitk has been actively engaging with big, medium, and small enterprises as well as the emerging companies through its carefully designed and structured industry engagement

programmes – Innovators (Residents), Pioneers (Affiliates) and Explorers (Prospective).

Current Members

Eight (8) resident companies with their R&D centres in Technopark@iitk premises, five (5) companies are in the pipeline, Eight (8) affiliate companies including JK Cement, BPL Medical Technologies, GE Oil and Gas & Technithon International Singapore.

R&D Impact on IITK Ecosystem

The impact generated by Technopark@iitk, via its member companies, in the past two and a half years of its operations, is as follows:

- Consultancy Projects – 4
- Joint Projects (funded by 3rd party) – 2
- Joint Guidance of MS/PhD students – 11
- Part-time Student Engagements – 13
- Full-time Student Employment – 4
- Extensive use of research facilities

One of the notable achievements of Technopark@iitk is their IITK Student-Industry Engagement program. Currently, 500+

students are registered under this program and get an opportunity to work on industry problems enhancing their practical knowledge and technical hands-on experience.

COVID Products and Prototypes

During the pandemic lockdown, the Technopark@iitk team conceived, designed, and developed a few prototypes in collaboration with our students and industry. The entire activity that lasted two months turned out to be one of the most experiential learnings for our students.

- Three research papers jointly written by Technopark team, IITK students and industry published in INAE Letters-COVID 19 Special.
- The project titled ‘Conceptual Design of Body Bag for Preventing Infections and Safe Disposal of Deceased from COVID-19 Virus’ won the first prize in the recently held ‘Azadi ka Amrit Mahotsav’ organized by the 4th INAE Youth Conclave 2021.

Outreach and Partnerships

- Signed an MoU with IIM Lucknow incubator (IIML-EIC) to expand the R&D ecosystem for industries and tech start-ups graduating from incubators.
- Existing partnership with NASSCOM.

- Organized a webinar titled ‘Technovation with IIT Kanpur’ in association with Indian Industries Association, Kanpur Chapter.
- Hosted a talk on ‘Technology Opportunities for Healthy India’ by BPL Medical Technologies.
- Hosted a brainstorming session with the members from TiEUP and IIA to discuss the challenges faced by MSMEs and the possible solutions.

Infrastructure

Technopark@iitk Annexe:

Operating out of the National Aerosol Building where it initially occupied 3rd and 4th Floors. 16,000 sq. ft. of additional space added to the existing facility by constructing four more floors, in November 2021. Upcoming Phase I Building: Two fully finished floors measuring 42,000 sq. ft. of space ready by January 2022. Four more floors measuring 108,000 sq. ft. of space planned.

Future Roadmap

With the vision of enabling co-development of cutting-edge technologies and innovations in line with the national priorities, Technopark@iitk has devised a sector specific approach in reaching out to industry and R&D organizations.

R&D EVENTS

Science Day

To mark the celebration of National Science Day, IIT Kanpur hosted a virtual event on February 28, 2021. The theme of this year was ‘Energy’. The first speaker of the event was Prof. Ashish Garg, Head of Sustainable Energy Engineering Department. He talked about the challenges and potentials of "Solar Photovoltaics". Prof. Sameer Khandekar, Head of Mechanical Engineering Department focused his presentation on Thermal Energy Management and shared his experiences on developing the "Thermal Energy Storage Systems" at the Centre for Environmental Science and Engineering building at IITK. Prof. Jishnu Bhattacharya, Department of Mechanical Engineering provided an overview of the promise, challenges, and the current status of the "Hydrogen as Energy Carrier".

Covid Week

IIT Kanpur organized a week-long series of talks on various aspects of COVID 19 modelling, biological research, healthcare, and management issues of the problem by inviting the field specialists and eminent academicians working in the field. Starting from 17th May 2021 and ending on 21st May 2021, five webinars had been arranged which focused on the problem at length. The

talks in the virtual platform were well attended by the researchers and people working in these domains.

COLLABORATIONS THROUGH MOU

IIT Kanpur signed an MoU with the Indian Air Force (IAF) to establish the Air Vice Marshal Harjinder Singh Chair of Excellence and Research Scholars' Program at Indian Institute of Technology Kanpur. The Chair of Excellence will promote teaching, research and technology development in Aerospace, Aircraft Structural Integrity, Aircraft Health Monitoring, and other allied subjects in Aeronautics & Aviation.

An MoU was signed with Albot Technologies Pvt. Ltd. for the commercialisation of an advanced low-cost oxygen concentrator based on the Pressure Swing Adsorption (PSA) technology.

An MoU has been signed to share the strategic partnership that embraces the importance of technology in healthcare innovation between IIT Kanpur and SGPGI Lucknow. This collaboration will result in developing solutions for affordable healthcare using telemedicine.

An MoU has been signed with Prasar Bharati to establish Centre of Excellence for Media and Broadcasting Technologies at IIT Kanpur. Following projects will be funded by Prasar Bharati

- Next Generation Broadcast Technology
- Automatic Speech Recognition for Speech Subtitling
- Archival Content Retrieval through Audio and Text Query

IIT Kanpur signed a Memorandum of Agreement (MoA) with the REC Foundation to support the upcoming School of Medical Research and Technology (SMRT) at IIT Kanpur. REC Foundation has committed

financial assistance of Rs. 14.4 crore under its CSR program for the construction of residential block for the upcoming SMRT.

IIT Kanpur and JK Cement Limited have collaborated to work on a super specialty hospital on the campus as part of the Institution's initiative to establish School of Medical Research and Technology (SMRT). An agreement was signed between IITK and JK Cement to collaborate on the project, and JKCL extended the support with funding of Rs. 60 crore as part of its CSR. The agreement was signed between Abhay Karandikar, Director IIT Kanpur and Raghavpat Singhania, Managing Director JK Cement Ltd among others. The agreement is part of the IIT Kanpur's endeavour to bring about a paradigm shift in approach towards medical research and innovation in the country. The proposed hospital has been named as "Yadupati Singhania Memorial Super Specialty Hospital" to honor the contribution of Yadupati Singhania, a 1975 BTech Civil Engineering alumnus of IIT Kanpur.

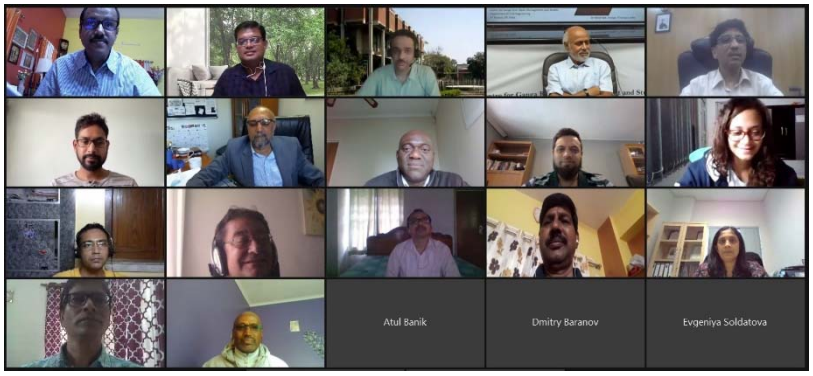
INTERNATIONAL ACADEMIC COLLABORATIONS

Despite the pandemic, in the past one-year IIT Kanpur has partnered with several international universities. In just 12 months, we have signed 10 MoUs with international universities from Taiwan, USA, Australia, Thailand, Jordan, and Japan across areas of academic & research collaboration, student exchange and joint degree programs. With these partnerships, our students will have more opportunities to conduct world-class research under the guidance of faculty from both IITK and a reputed partner university.

In July 2021, the Office of International Relations at IIT Kanpur, along with NIT Durgapur, organized a conference as part of the BRICS Network University. The conference topic was Water Resources and Pollution Treatment and participants included researchers from the BRICS countries. The conference was held from 6th – 8th July, and it offered a fantastic opportunity to meet and interact with eminent academicians and scientists from BRICS nations in the fields of Water Scarcity, Surface & Groundwater Interaction, Extreme Climate Events, Water Supply & Treatment, and Wastewater Treatment Technology etc. It allowed participants to acquaint themselves with the latest in the water resources management field and collect information on new techniques and technologies in community-based water

and wastewater management, water harvesting and storage, water policy, utilisation, quality issues etc.

In this last year, we have also set up the IITK-La Trobe University Research Academy to enable collaborative research, joint training and scholarship support for doctoral students who jointly enrol at both IIT Kanpur and La Trobe University, Australia. Apart from undertaking research work, the Academy will also facilitate the translation of research into practice and enable its commercialisation. The Academy will focus on a wide range of areas, starting from the research, planning and evaluation of complex Smart Cities. Research though will not be the only aim of the Academy; it will also be training skilled research leaders through the Joint Doctoral Degree Program.



FINANCIAL RESOURCE MOBILIZATION

Out of the total amount of around Rs.113.81 crore pledged by donors in the last 12 months, a total of Rs. 84.39 crore has been received this year as compared to Rs. 19.15 crore last year and the balance is expected to be received based on the milestones achieved as set by the donors in the next one year.

Some Notable Contributions: (All Figures are in Crore)	Pledged (Rs.)	Received (Rs.)
School of Medical Research and Technology	130.86	20.12
Centre for Energy Policy and Climate Solutions	18.25	10.91
Mehta Family Centre for Engineering in Medicine	17.50	4.43
Dr. Ranjit Singh Rozi Shiksha Kendra	13.30	13.82
Late Jay Pullur Memorial Fund	5.00	5.00
Air Vice Marshal Harjinder Singh, VSM Class I MBE Chair of Excellence/Research Scholar Program IAF officers	3.50	3.50
Prof.. R. N. Biswas Endowment for Teaching Excellence	2.50	2.17
Yadupati Singhania Memorial Chair	1.25	1.25
Tapas Mishra Memorial Chair in Computer Science and Engineering	1.25	1.21
Pavitar Joneja Chair	1.30	1.30
Department of Chemical Engineering Modernization of the Unit Operations	1.00	0.77

Laboratory (UOL) and the Workshop Facility		
IIT Kanpur Development Foundation	0.54	0.54
Batch of 1965 Scholarship	0.52	0.52
Artificial Heart Project	0.25	0.25
Shri. Yadupati Singhania Memorial Scholarship	0.20	0.20
Shobha Memorial Scholarship	0.15	0.15
Arish Ali Scholarship	0.14	0.14
Prof. U B Tewari Memorial Fund	0.13	0.13
Chandra Prabha and CharanDass Gupta Gold Medal	0.13	0.13
Sandeep & Shruti Gupta Talent Scholarship	0.13	0.13
Bhawani Shankar Meena Memorial Scholarship	0.13	0.13
Dr. Vijay K Varma Talent Scholarship	0.13	0.13
Smt. Savitri Devi Memorial Scholarship	0.13	0.13
Mrs. Nirmal Kumari Gaur Scholarship	0.13	0.13
Late Shri Nathmal Kanodia Scholarship	0.13	0.13
Young Faculty Fellowship	0.10	0.10

IITK Development Foundation

IIT Kanpur is a Government of India Funded Technical Institute. Established in 1960, its mission is to enable a creative and dynamic learning environment, build industry-academic collaboration, and develop sustainable research solutions for the benefit of the nation. The Institute is dependent on Central

Government funding to the extent of over 75% of its needs. As IITK grows, the gap between Central Government funds and the Institute needs is widening. With the ever-growing number of departments, faculty and students, there is a constant need to raise funds for the various programmes and initiatives run by the Institute. To innovate cutting-edge technology, state-of-the-art R&D facilities need to be built; our faculty are known for their ground-breaking research, it is thus imperative to provide fellowships that will motivate and encourage them to produce path-breaking research; we run many scholarship programs that give financial aid, especially to economically weak students and motivate girl students to continue their studies. IIT Kanpur believes in inclusivity and thus runs many community welfare programs as well, such as Opportunity School, Shiksha Sopan, Prayaas that provide education and vocational training to children from the neighbouring villages of the Campus. Hence, with the ever growing need to raise funds for the various activities/programs of the Institute, a separate professional fund raising organization for IIT Kanpur was created, IIT Kanpur Development Foundation. It is a section-8 company of the Institute approved by the Board of Governors in June 2020.

COVID – 19 Relief Fund

The second wave of Covid-19 pandemic severely impacted the IIT Kanpur campus community including faculty, students, and

staff. The students of IIT Kanpur are an integral part of the IITK community and their welfare is of utmost importance to the Institute. Hence, the “COVID - 19 Relief Fund” was set up to deal with the financial hardships faced by the IITK community including students. The fund was raised through generous contributions from faculty, alumni, IITK collaborators, etc. and supported the IITK students and their families to meet the medical expenses for their own treatment and/or treatment of their immediate family members. The purpose of the fund was to cover unexpected circumstances needing immediate assistance, such as food, medication, other personal health, and safety needs for the IITK community including students and their immediate family members. The Relief Fund also helped the frontline staff of IITK, such as mess workers, etc. and promptly responded to any other emergencies arising on account of COVID 19.

The Institute had created an online portal, where students and supporting staff could submit their application for the disbursement with necessary documents. A committee headed by Dean of Student's Affair (DOSA) reviewed the appeals on regular basis and the funds were immediately transferred to the beneficiaries from the Dean of Resources & Alumni (DORA) office. The COVID – 19 Relief Fund raised an amount of Rs. 1.63 crore during the months, May, June, July, and August 2021

and the entire IIT Kanpur campus community is immensely grateful to all the contributors.

Campaigns and Memorial Funds

Various campaigns run by IIT Kanpur are used to raise funds for different initiatives from time to time. In the year 2020, the focus of our campaigns was to raise funds for many Covid-19 relief operations that had arisen due the strict lock downs imposed by the Government of India. Generosity extended by our alumni and well-wishers across the globe to support Campus Workers' Campaign, and Community Welfare, etc. was quite heart-warming. Through these contributions, many workers of our campus were able to run their households and daily wagers/migrant workers were able to receive food rations. IITK conducts Memorial Fund campaigns to help raise money for the families of the deceased to provide much needed financial aid. The amount raised by the office was used by the families to give education to their children, for medical expenses, or any other emergency that may have arisen. The funds also came as a big moral support to families as sometimes the deceased was the only earning member. We are thankful to our batches individual donors for extending a helping hand to such families in the times of crisis.

S.No	Campaign Name (Student/Faculty& Community welfare)	Amount in Rs. (Crore)
1.	Prof. R. N. Biswas Endowment for Teaching Excellence	2.17
2.	Covid-19 Relief Fund	1.63
3.	Campus Worker Fund	0.90

	Campaign Name (Memorial Fund)	Amount in Rs. (Crore)
1.	Manish Bhatnagar Memorial Fund	0.64
2.	Sanjeev Shukla Memorial Fund	0.37
3.	Ashok Kumar Memorial Fund	0.7

CLASS INITIATIVES AND CONTRIBUTIONS

Major Donations received towards Endowment Activities (October 2020 – September 2021)

S.No	Faculty Chairs	Amount in Rs. (Crore)
1.	Air Vice Marshal Harjinder Singh, VSM Class I MBE Chair of Excellence/ Research Scholar Program IAF officers	3.50
2.	Prof.. R. N. Biswas Endowment for Teaching Excellence	2.17
3.	Pavitar Joneja Chair	1.30
4.	Yadupati Singhania Memorial Chair	1.25
5.	Tapas Mishra Memorial Chair in Computer Science and Engineering	1.15
	Faculty Fellowship	
1.	Young Faculty Fellowship	0.10

S.No.	Scholarships	Amount in Rs. (Crore)
1.	Batch of 1965 Scholarship	0.52
2.	Shri. Yadupati Singhania Memorial Scholarship	0.20
3.	Dr. Vijay K Varma Talent Scholarship	0.15
4.	Shobha Memorial Scholarship	0.15
5.	Arish Ali Scholarship	0.15
6.	Bhawani Shankar Meena Memorial Scholarship	0.13
7.	Sandeep & Shruti Gupta Talent Scholarship	0.13
8.	Late Shri Nathmal Kanodia Scholarship	0.13

9.	Mrs. Nirmala Kumari Gaur Scholarship	0.13
10.	Smt. Savitri Devi Memorial Scholarship	0.13

S.No.	Award	Amount in Rs. (Crore)
1.	Chandra Prabha and Charan Dass Gupta Gold Medal	Rs. 0.13

CSR INITIATIVES (October 2020 – September 2021)

S.No.	Name of Company	Amount in Rs. (Crore)
1.	IBM India Pvt. Ltd.	9.00
2.	Citibank	2.86
3.	Ericsson India Private limited	1.49
4.	Portescap India Pvt. Ltd.	1.38
5.	TCS Fellowship	1.16
6.	REC Foundation	0.81
7.	Johnson Controls India Pvt. Ltd.	0.58
8.	ICICI Securities Ltd Proprietary	0.50
9.	IndusInd Bank Limited	0.50
10.	Info Edge Indian Limited	0.50
11.	Standard Chartered Bank	0.50
12.	Khanna and Khanna Limited	0.45
13.	Power Finance Corporate	0.36
14.	Infosys Foundation	0.25
15.	Suraj Logistix Pvt. Ltd.	0.21
16.	LIC Housing Finance Limited	0.19
17.	Penam Laboratories Ltd	0.15
18.	Power System Operation Corporation	0.14

19.	Goods And Services Tax Network	0.14
20.	Vtol Aviation India Pvt. Ltd	0.13
21.	Indian Energy Exchange Ltd.	0.12
22.	Ganesha Ecosphere Ltd.	0.9
23.	Raramuri Technology Pvt. Ltd.	0.2
24.	Prescience Insilico Private Limited	0.1

Major Donation

S.No.	Name of Donors	Amount in Rs. (Crore)
1	Late Ranjit Singh (BT/MME/1965)	11.69
2	Muktesh Pant (BT/CHE/1976)	11.12
3	Sudhakar Kesavan (BT/ CHE/1976)	10.91
4	Nirmala Govindan	5.00
5	Indian Air Force	3.50
6	The Mehta Family Foundation	2.91
7	Dev Joneja (BT/ME/1984)	1.70
8	J. K. Cotton Limited	1.25
9	Jagjeet S. Bindra (BT/CHE/1969)	0.77
10	Ranodeb Roy (BT/CSE/ 1990)	0.55
11	Mukesh Bansal (BT/CSE/1997)	0.30
12	Rajiv Batra (BT/EE/1982)	0.26
13	Sudha N Murty	0.25
14	J K Cement Ltd.	0.20
15	Mukesh Singh (BT/CSE/1997)	0.20

16	Pradeep Sindhu (BT/ EE/1974)	0.18
17	Sudhir Mohan Mittal (BT/ CHE/1970)	0.18
18	Keshav Sharma (BT/CSE/1983)	0.17
19	Arish Ali (BT/ EE/1996)	0.15
20	Aditya Soni	0.14
21	Batch of 2000	0.13
22	Anil K. Gupta (BT/ME/1970)	0.13
23	Sandeep & Shruti Gupta (MT/ME/1999)	0.13
24	Vijay Varma (MT/EE/1978)	0.13
25	Mayank Kanodia (BT/CE/2001)	0.13
26	Rita Pandey (PHD/HSS/1985)	0.13

S.No.	Major Activities	Amount in Rs. (Crore)
1.	Dr. Ranjit Singh Rozi Shiksha Kendra	11.69
2.	School of Medical Research and Technology	11.12
3.	Centre for Energy Policy and Climate Solutions	10.91
4.	The Mehta Family Foundation	2.92
5.	IITK Development Foundation	0.62
6.	Artificial Heart Project	0.25

B. ALUMNI IMPACT

Selected Notable achievements in the fields of science and technology by our alumni:

Our alumni have been the proud recipients of various honours and awards in various categories during FY 2020-21 as per the following details:

Category of Award	Number of Awards
Academic Awards	20
Industrial Awards	3
Government Awards	4

Some of the major achievements are as follows:

S.No.	Award	Name of Alumni	Award Endowed by
1	IEEE Fellow	Prof. Yogesh Singh Chauhan (MT/EE/2003)	The Institute of Electrical and Electronics Engineers, USA
2	IEEE Fellow	Dr. Achintya K. Bhowmik (BT/ME/1996)	The Institute of Electrical and Electronics Engineers, USA

3	Member of the National Academy of Engineering, USA	Dr. Murty V.V.S. Yalla (MT/EE/1983)	National Academy of Engineering, USA
4	Shanti Swarup Bhatnagar Prize 2020 in Chemical Sciences.	Prof. Jyotirmayee Dash (PhD/CHM/2003)	Council of Scientific and Industrial Research, Government of India
5	Indian National Academy of Engineering (INAE) - Young Engineer Award 2020.	Prof. Raghvendra Kumar Chaudhary (PhD/EE/2014)	Indian National Academy of Engineering, New Delhi
6	Alexander von Humboldt Fellowship.	Dr. Manudeo Singh (PhD/ES/2019)	The Federal Foreign Office, the Federal Ministry of

			Education and Research, the Federal Ministry for Economic Cooperation and Development
7	Fellow of the Royal Society, UK.	Prof. Thirumalai Venkatesan (MSC2/PHY/ 1971)	Royal Society of London
8	American Astronautical Society Fellow 2020.	Prof. Kamesh Subbarao (BT/AE/1993)	American Astronautical Society
9	CTO of the Year Award 2021.	Mr. Satya Gupta (BT/CHE/198 2)	Virsec
10	Fellow of the Canadian Academy of Engineering, 2021.	Prof. Rajiv K. Varma (BT/PhD/EE/ 1980/ 1988)	Canadian Academy of Engineering

11	Faculty Early Career Development (CAREER) Award	Dr. Snigdha Chaturvedi (BT/CSE/2009)	National Science Foundation (NSF), USA
12	National Science Foundation Faculty Early Career Development Award.	Dr. Eshan Chattopadhyay (BT/CSE/2011)	National Science Foundation (NSF), USA
13	National Science Foundation Faculty Early Career Development Program Award.	Dr. Pravesh K Kothari (BT/EE/2010)	National Science Foundation (NSF), USA
14	Technology Development Board, Government of India National	Mr. Nikhil Kurele (BT/ME/2016), Mr.Harshit Rathore	India Dept. of Science & Technolgy

	Award 2021 for technology startup by IndiaDST. Noccarc won the award for its indigenous ICU ventilator, Noccarc V310 and Noccarc H210.	(BS/CHM/2016) (Co-founders Noccarc Robotics)	
15	UCSD CSE MS Student Achievement for Excellence in Research, 2021.	Mr. Dheeraj Mekala (BT/CSE/2017)	University of California, San Diego
16	The Toycathon 2021 URA Career Cards	Mr. Prithvi Raj (M.Des/2016)	Ministry of Education's Innovation Cell with support from

	category.		All India Council for Technical Education, Ministry of Women and Child Development, Ministry of Commerce and Industry, Ministry of MSME, Ministry of Textiles and Ministry of Information and Broadcasting.
17	Sun Pharma Research Award 2020 under Pharmaceutical Sciences category	Prof. Srivatsan S. Gopalan (PHD/CHM/2003)	Sun Pharma
18	Fellow at Synopsys	Dr. Deepak Sherlekar (MT/CSE/198	Synopsys

		1)	
19	National Academy of Inventors (NAI) Senior Member for 2021.	Dr. Ashutosh Tiwari (PhD/PHY/2000)	U.S. and international universities, and governmental and non-profit research institutes
20.	Recipient of the 2020 ACM-IEEE CS Ken Kennedy Award.	Prof. Vivek Sarkar (BT/EE/1981)	ACM and the IEEE Computer Society
21	Indian National Academy of Engineering (INAE) - Young Engineer Award, 2020.	Prof. Raghvendra Kumar Chaudhary (PHD/EE/2014)	Indian National Academy of Engineering
22	IEEE Electron Devices	Dr. Harshit Agarwal (PHD/EE/201	The Institute of Electrical and Electronics

	Society Early Career Award 2020.	7)	Engineers, USA
23	National Science Foundation Career Award.	Dr. Samanvaya Srivastava (BT-MT/CHE/2009)	National Science Foundation (NSF), USA
24	2020 SME College of Fellows.	Prof. Anil Srivastava	SME International Awards & Recognition Committee
25	Chemical Research Society of India (CRSI) Bronze medal for 2020.	Prof. Srivatsan Seergazhi Gopalan (PhD/CHM/2003)	Chemical Research Society of India
26	Fellow of The Royal Aeronautical Society	Dr. Kamesh Subbarao (BT/AE/1993)	Royal Aeronautical Society

	(RAeS)		
27	Award of Excellence under the Digital India Initiative called 'Bihar Pravasi Sahayta Yojna	Mr Chanchal Kumar (BT/MT/CSE/ 90/92)	Bihar Pravasi Sahayta Yojna

C. Notable entrepreneurial endeavours by some of our alumni:

S.No.	Name of the Alumnus	Entrepreneur in the field of
1.	Mr. Nishant Agarwal (MT/ME/2018)	Founder of Life & Limb- Life & Limb are developing an affordable Multi-fingered Prosthetic Hand for Trans-radial Amputee.
2.	Mr. Manas Agarwal (BT/CSE/2010)	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.
3.	Dr. Deepak Gupta (BT/MME/1987)	Transpack Technologies - is engaged in the business of demonstration on a mobile phone, to distinguish between 3D tag and its 2D look alike. It develops a user- friendly app-less methods for farmers and user of agro and medical products for authenticating a PUF/tag and play AR/VR videos.
4.	Mr. Nandan Misra (BT-MT Dual/CHE/2012)	Algo8 AI brings Data Science expertise and enables the digital transformation of a client into a data-driven organization. Born in India & based in Canada, Algo8 AI was founded in 2016. In almost four years of its operations, Algo8 AI has enabled data-driven transformation

		for businesses in the field of manufacturing, oil & gas, metals & mining, energy & utilities, FMCG etc. In a nutshell, Algo8 AI develops Artificial Intelligence (AI) / Machine Learning (ML) products for optimizing last-mile operations in large industries. We offer customized solutions for applications in process-oriented industries. Our products are based on a holistic understanding of industrial processes, gained from extensive research, and collaboration with industry professionals and subject matter experts.
5	Mr. Saket Khandelwal (BT/MSE/2019)	STEMrev Refineries are working toward bringing commercialisation to the otherwise considered agro waste (200MT per year) by converting them into value added advanced packaging materials. The mission is to build high efficiency technology to bring commercial value to the agricultural waste and bring it back into the ecosystem by converting it into pulp and products replacing plastic.

Some Notable Professional Achievements by our Alumni:

S.No	Name of Alumni	Position
1.	Shri Ashwini Vaishnaw ji (MT/IME/1994)	Appointed as the Union Minister of Railways and Minister of Electronics, IT and Communication.
2.	Prof. Jainendra K. Jain (MSC2/PHY/1981)	Inducted as a member of the US National Academy of Sciences.
3.	Prof. Arup Chakraborty (BT/CHE/1983)	Named as the Institute Prof. at Massachusetts Institute of Technology, USA.
4.	Prof. Sanjay Ranka (BT/CSE/1985)	Promoted to Distinguished Prof. at the University of Florida in the Department of Computer Information Science and Engineering.
5.	Ms. Vartika Shukla (BT/CHE/1988)	Took charge as the Chairman & Managing Director at Engineers India Limited.
6.	Mr. Aan S. Chauhan (BT/EE/1995)	Appointed as the Chief Technology Officer (CTO) of Mindtree.
7.	Mr. Rajinder (Raj)	Appointed as the Chief Risk Officer

	Singh (BT/ME/1983)	at NewRez LLC.
8.	Mr. Asutosh Padhi (BT/ME/1993)	Appointed as the Managing Partner, McKinsey & Company, North America.
9.	Mr. Kartik Mani (BT/ME/1992)	Appointed as the Head of Asia Consumer Bank by Citi.
10.	Mr. Dharmendra N. Choudhary (BT/ME/1988)	Became a partner in Grunfeld, Desiderio, Lebowitz, Silverman & Klestadt LLP.
11.	Mr. Lalit Jalan (BT/EE/1979)	Appointed as the Indian Chairman of 3Lines Venture Capital.
12.	Prof. Thirumalai Venkatesan (MSc2/PHY/1971)	Appointed as the Director Designate at the Oklahoma University (OU) Center for Quantum Research & Technology.
13.	Mr. Bipin Singh (BT/CHE/2003)	Appointed as VP Marketing at Nexla.
14.	Dr. Umakant Dash (PhD/HSS/1997)	Appointed as the Director of The Institute of Rural Management-Anand (IRMA), Gujarat.
15.	Dr. Arvind Krishna (BT/EE/1985)	Appointed as Chairman of IBM.

16.	Prof. Saikat Guha (BT/EE/2002)	Appointed as the Director of Center for Quantum Networks
17.	Mr. Arun Seth (BT/EE/1973)	Appointed as the Chairman of TEMA (Telecom Equipment Manufacturers Association of India), National Development Council for Start-ups.
18.	Mr. Gokul Rajaram (BT/CSE/1995)	Joined Pine Labs as an Advisor.
19.	Mr. Sanjay Malhotra (BT/CSE/1989)	Appointed as the Chairman & Managing Director of REC Limited.
20.	Prof Rishikesha Krishnan (MSc/PHY/1986)	Appointed as the Director of IIM, Bangalore.
21.	Dr. V. Palaniappan (PHD/CHM/1988)	Appointed as the CTO of Aruvant Science Inc.
22.	Mr. Alok Agarwal (BT/AE/1987)	Appointed as the new board member of Prasar Bharti, India.
23.	Dr. Mahesh Gupta (BT/ME/1975)	Selected as the nominee of the UP Govt. on IIT Kanpur Board of Governors.

Awards to the Alumni by the Institute on Foundation Day

Institute celebrated its foundation day on 2nd November 2021. Every year on this day, IIT Kanpur recognizes the accomplishments their alumni and confers with the Institute Fellows, Distinguished Alumnus, Distinguished Services, Young Alumnus and Satyendra K Dubey Memorial awards. BOG Chairman Dr Radhakrishnan K Koppillil presided the function and Hon'ble Shiksha Mantri Shri Dharmendra Pradhan ji delivered the Foundation Day lecture.

List of Awards at the Foundation Day are listed below:

Institute Fellows 2020

S. No.	Name	Association with IIT Kanpur	Current Position
1	Mr. Jagjeet Singh Bindra	BT/CHE/1969	Member of Board of Directors Lyondell Basell Industries NV & HPCL – Mittal Energy Ltd.
2	Prof. Gautam Biswas	Faculty since 1990	Emeritus Fellow Department of Mechanical Engineering Indian Institute of Technology Kanpur Kanpur
3	Prof. Santosh K. Gupta	BT/CHE/1968	Distinguished Prof. Department of Chemical Engineering

			University of Petroleum and Engineering Studies (UPES) Dehradun
4	Prof. Alak Kumar Majumdar	Faculty from 1972 to 2006	Former Prof. Department of Physics Indian Institute of Technology Kanpur Kanpur

Distinguished Alumnus Award 2021

S.No.	Name	Association with IIT Kanpur	Current Position
1	Mr. Rakesh Bhargava	BT/CHE/1973	Former Chairman Fresenius Kabi Oncology Ltd
2	Ms. Vartika Shukla	BT/CHE/1988	Chairperson & Managing Director Engineers India Ltd
3	Mr. Hemant Kumar Jalan	BT/CHE/1977	Managing Director Indigo Paints Ltd
4	Mr. Ashwini Kumar Vaishnaw	MT/IME/1994	Cabinet Minister Ministry of Railways Govt. of India
5	Mr. Mukesh Bansal	BT/CSE/1997	CEO & Co-founder CureFit
6	Mr. Saurabh Chandra	BT/EE/1976	Director & Chairman

			Multi Commodity Exchange of India Ltd/
7	Mr. Rahul Garg	BT/EE/2001	Founder & CEO Moglix
8	Prof. Rajesh Kumar Gupta	BT/EE/1984	Department of Computer Science & Engineering University of California San Diego, USA
9	Prof. Vijay Vittal	MT/EE/1979	Regents Prof. Arizona State University, USA
10	Prof. Abhay Lalit Deshpande	MSC2/PHY/1987	Department of Physics & Astronomy Stony Brook University USA
11	Dr. Dev Joneja	BT/ME/1984	Chief Risk Office Exodus Point Capital Management. USA

Distinguished Services Award 2021

S.No.	Name	Association with IIT Kanpur	Current Position
1	Mr. Pradeep Bhargava	BT/ME/1989	COO & Co-founder GladMinds
2	Mr. Kushal Chand Sacheti	MT/CHE/1972	Founder & CEO Galaxy USA Inc.

Young Alumnus Award

S.No.	Name	Association with IIT Kanpur	Current Position
1	Dr. Prateek Jain	BT/CSE/2004	Senior Research Staff Google AI, Bengaluru India
2	Mr. Varun Khaitan	BT/EE/2009	COO & Co-founder Urban Company

Satyendra K. Dubey Memorial Award

S.No.	Name	Association with IIT Kanpur	Current Position
1	Mr. Karnal Singh	MT/CSE/1981	IPS Officer (Retired) Government of India

FACULTY RECRUITMENT

In the past one year, the Institute has offered 63 faculty positions against a rigorous selection from 796 applicants. Out of these, 28 new faculty members have joined the Institute. The appointments per department are mentioned below:

Department	**Number of new faculty**
Aerospace Engineering	02
Biological Sciences and Bioengineering	01
Chemical Engineering	01
Chemistry	-
Civil Engineering	01
Cognitive Science	01
Computer Science and Engineering	03
Earth Sciences	03
Economic Sciences	04
Electrical Engineering	03
Humanities and Social Sciences	01

Industrial and Management Engineering	01
Materials Science and Engineering	01
Mathematics & Statistics	01
Mechanical Engineering	01
Physics	04
Sustainable Energy Engineering	00

During this period, 78 Postdoctoral fellowships, 18 Visiting Faculty positions, 9 Adjunct Faculty positions, and 1 Distinguished Honorary Professor position have also been offered.

AWARDS AND HONORS

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 Prof. Vinod K. Singh (CHM) has been selected to receive the "TWAS Regional Award - 2020 for Building Scientific Institutions". Dr. Dootika Vats (MTH&S) has been awarded the

Blackwell-Rosenbluth Award by j-ISBA (junior-International Society for Bayesian Analysis). Prof. Sankar P Rath (CHM) and Prof. D. Dethe (CHM) have been selected for the SERB Science and Technology Award for Research (SERB-STAR). Prof. S. C. Srivastava (EE) received the IEEE IC Lifetime Achievement Section Chair Award 2020 for his outstanding contributions to the IEEE Uttar Pradesh Section and India Council. Prof. Mukesh Sharma (CE) has been awarded the “Air Quality Research Lifetime Achievement Award” for the year 2020 at the Indian International Conference on Air Quality Management (IICAQM). Prof. Sandeep Verma (CHM) has been chosen for the A.V. Rama Rao Technology Award 2021, instituted by CSIR-Indian Institute of Chemical Technology in collaboration with AVRA Laboratories Pvt. Ltd, Hyderabad. Prof. Yogesh M. Joshi (CHE) has been awarded the prestigious Academy excellence award 2021 of the Defence Research and Development Organization (DRDO).

Dr. Hamim Zafar (CSE) has been selected to receive the Har Govind Khorana-Innovative Young Biotechnologist Award (IYBA) 2020 from the Department of Biotechnology India. Dr. Kaustubh Kulkarni's (MSE) paper in JMR has been selected for 2020 Gordon E. Pike Prize for the JMR Paper of the Year. Dr. Sudhanshu Shekhar Singh (MSE) has been selected for the NASI-Young Scientist Platinum Jubilee Award in Physical

Sciences, for the year 2020. Dr. Joydeep Chakrabortty (PHY) has been awarded the DIVA award from the Institute of Particle Physics Phenomenology at Durham University. Dr. Bushra Ateeq (BSBE) has been selected for the S. Ramachandran - National Bioscience Award for Career Development for 2020-2021 from DBT. She also received the Shanti Swarup Bhatnagar Prize (SSB) for Science and Technology 2020 in Medical Sciences. Prof. Arun Kumar Shukla (BSBE) has been selected for Bhatnagar Prize (SSB) for Science and Technology 2021 in Biological Sciences and Prof. Nitin Gupta (BSBE) has been selected for Swarnajayanthi Fellowship (2021) in the field of Biological Sciences.

Prof. S. P. Rath (CHM) has been awarded Prof. R S Varma Memorial Award for the year 2020 by Indian Chemical Society. Prof. Shantanu Bhattacharya (ME) has received the IETE R. S. Khandpur award for 2020 for his research contributions in domains related to medical devices for detection and sensing. Dr. Rahul Mangal (CHE) has received the INAE Young Engineer Award 2020. Dr. Indra S. Sen (ES) has received the Young Researcher Award in the field of Earth System Sciences 2020. Dr. Arijit Ganguly (MTH&S) has been elected for the “Sushila and Kantilal Mehta Award” for the year 2020.Prof. Animesh Biswas (EE) has been chosen for IETE - Ram Lal Wadhwa Award for the year 2020 for outstanding original

contribution in the field of electronics and telecommunication engineering during the last ten years. Prof. Subhas C Misra (IME) has been awarded SuJSS Finalist Most Influential Paper Certificate by the Journal of Systems and Software (Elsevier).

Teachers' Day

On Teachers' Day, IIT Kanpur recognizes and celebrates the excellence of Institute's teachers in empowering the students with knowledge and wisdom. This year the function was celebrated in a hybrid mode with only the awardees present in person. The chief guest for the occasion was Prof Rohini M Godbole of the Indian Institute of Science Bangalore who joined online. Prof. Y.N. Mohapatra (PHY) and Prof. Parasar Mohanty (MTH&S) have received the Distinguished Teacher Award for the year 2021.

STUDENTS' AWARDS

The many prestigious scholarships and awards received by our students have been a matter of pride and pleasure for us. Anish Saxena, Antreev Singh Brar, Durgesh Rajendra Agrawal, Ishanh Misra, Varun Goyal, Yatin Dandi, Yugesh Ajit Kothari, received the Aditya Birla Scholarship. Shivansh Tripathi, Manan Agarwa, Mandar Bapat received the O.P. Jems scholarship. Uttkarsh Bhalika received ACC Fellowship.

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

STUDENTS' 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:

CELLS

Cell for Continuing Education (CCE)

A short-term training Program - PSA Oxygen generation Plant: was conducted by CCE on 2nd June 2021. This training programme is designed for master trainers who will eventually train technicians working on the PSA Oxygen Generating Plants, which are being installed throughout the country. The

course outlines the fundamentals behind the plant operation, generic layout of such plants, maintenance issues and troubleshooting aspects.

E-Cell

Two flagship events were conducted, Entrepreneurial Bootcamp and Entrepreneurial Extravaganza.

Entrepreneurial Bootcamp was conducted between 4th July and 8th August 2020. The Bootcamp included events like, Opportunity Discovery - Identify a Problem Worth Solving, Customer Discovery, Building Your Business Model - Using the Lean Canvas, Prototype Validation and MVP, Understanding Your Market, Funding and Pitching.

Entrepreneurial Extravaganza was conducted from 26th July to 2nd August 2020. Speakers for panel discussions and sessions were Mr. Kris Gopalakrishnan, Mr. Mohandas Pai, Mr. Ram Gopal, Ms. Melissa Frakman, Dr. Ritesh Malik, Mr. Vikram Gupta, Mr. Jayesh Parekh, Mr. Hussein Kanji, Mr. Jatin Rajput, Mr. Piyush Gupta, Ms. Shuvi Shrivastava, Mr. Saurabh Tiwari, Mr. Farid Ahsan, Mr. Sidharth Gupta. Workshops were conducted, namely, Tech 101 for Start-ups and Idea Validation.

For campus community, following events were conducted:

1. Talk with partner of Y combinator
2. Startup 101 (a lecture series on entrepreneurship and startup related topics)
3. Campus Hangouts (special interactive sessions, an informal discussion between campus junta and entrepreneurship oracles of varied arenas)
4. Startup Mentorship Programme (panel discussion followed by idea registrations from students along with their mentor preferences)
5. Business Conclave (Panel Discussion: Innovation or Imitation, Game of Auctions, Biz Quiz, Stock the Stock, Business Model Canvas Workshop and Competition, Product Management Workshop and Competition)
6. Summer Undergraduate Entrepreneurship Program (Ongoing)
7. Startup Internship Program
8. Certified Machine Learning Practitioner Certification by Mr. Henry Harwin
9. Breast Awareness Week in October. Dr. Bhavana Chaudhary was invited as guest.
10. Entered a deal with Times Bridge and Headspace to distribute free licenses of their mental wellness programme in the campus.

11. A workshop in association with Sisters Living Works, an NGO that is engaged in suicide prevention, providing suicide prevention education and building awareness.

Prayas: Following events, initiatives, sessions, and celebrations were conducted:

Online classes, textbook distribution, Ration Distribution Drive, Smartphone Collection Drive, Prayas scholarship for higher education, Vocational Education, Storytelling and poetry sessions, women and careers (Weekly talk series on creating awareness about career path for women), Prayas Magazine (Ek Pahal), Worksheets for chemistry experiment at home, Sanitary pad dispensing machine, Upgrading Prayas Library, Prayas website, Self-defense classes, Alumni sessions, Board games and Musical instruments, Study tables, Gandhi and Lal Bahadur Shastri Jayanti, Deepawali and Children's day celebration, Prayas birthday

Prakriti:

1. Conducted a 7-event sustainability challenge during the COVID-19 Lockdown aimed at promoting environmental positive activities at student homes.
2. Green Periods Live Instagram Stream: In collaboration with Green Sphere Society, IGDTU, organized and conducted a live Instagram stream to explain the benefits of menstrual cups. Conducted online discussion

sessions about climate change and its impact in the Indian context.

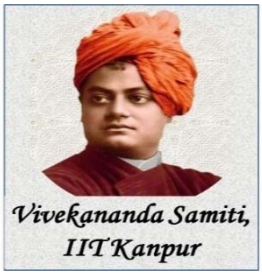
Raktarpan: Conducted competitions, namely, meme-making competition, article writing competition, Online Case Study Competition, Art for Awareness. An awareness session was organized in August 2020. The speaker was Dr. Praveen Katyarji. An awareness session 'Bountiful Dwell in Blood Donation' was conducted over zoom. It was based on information about blood donation. The guest was Mr. Harsh from the BlooodConnect.

Unmukt: Celebrated International Day Against Homophobia, Transphobia, and Biphobia (IDAHOT) via posts and comics.

Pride Month is a collaborative event with IIT Gandhinagar. Events were organised by Joyita Mondal, Smiitinn B, Richa Vashista, Saruta Rawat, Zainab Patel, and Rohan Vohra. Events included participation in a 21-day Allyship challenge held by pride circle an initiative to make the workplace environment more inclusive.

Supergays is an initiative by us to throw light upon the life of LGBTQ+ individuals.

Vivekananda Samiti



Launched a new website, created discord server, posted lectures on youtube channel, resumed weekly guided meditation sessions, held discussion sessions on the works of Swami Vivekananda, conducted talks in association with the 'Nation Building: The Vivekananda Way' programme, organised by Inter IIT-IISc Vivekananda Study Circles, in process of starting a series called 'Shastrarth' on Facebook page, conducted a talk by Dr. Amit Neogi on National Youth Day and organized various other talks in association with RKM Kanpur.

Vox Populi

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

In the previous year, Vox Populi managed to spread its reach to a greater number of people by starting the Vox Populi

subscription drive, which is currently reaching out to around 300 people via free-of-cost email updates. Along with this, Vox also explored some new ideas to mark its presence amidst a larger audience by initiating several new series like:

Unorthodox Career Choices-Continuing the flagship series by interviewing and publishing interviews/blogs. 7 articles- Parts 3-9 of the series have been released.

As We Leave-The series of blogs by the graduating batch students. 30 articles and a launch video have been released under this series so far.

Let's Talk Struggles-A series where alumni talk about their struggles on campus pertinent to certain topics.

Vox Walks- Continuing our series with 4 additions in this tenure so far.

COVID19 and Online Semester Specific-7 articles released under this so far.

Campus Blueprints- Initiated a series to study the journey from the foundation to the current stage of different groups at IITK. Released the 3 articles- for Prayas, Unmukt, Raktarpan.

Academia Redefined: A video series that illustrated problems in academia in online semester.

EDADs: Covered the dialogue and debate and moderated through a prepared questionnaire in collaboration with EC.

IITK in NIRF Rankings- An extensive infographic analysis of IITK's performance over the different factors taken into consideration for NIRF rankings.

Comics- A comic and a satirical video was released for "Hostel rooms in Lockdown" and "Preregistration Fiasco" respectively.

2020-year summary from Holi to December- administration's perspective and other things in college

Website- Design complete, migration of content in progress.

Interviews-3 interviews have been published so far-

- Mr. Anil Swarup (Retired IAS Officer)
- Mr. Abhishek Gupta (Chief India Economist at Bloomberg)
- Mr. Mayur Dixit (Y4 alumnus)

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 Front: Events in this front were:

Mock-en-Joy: To help students applying for internships with the interviews.

Distinguished Alumni Interview Series: Prepared a database of approximately 200 DAA awardees (1989-2019) obtained from the DORA and IITKAA websites.

Senior Class Gift Program 2021.

Alumni Buddy Program: Groundwork of creation of a database by sending invitations to all Y14 UG alumni available on LinkedIn completed.

Other events include:

Use of LinkedIn Premium for expanding Alumni Database, IIT Konnect Newsletter and related work, Hall 2, and Hall 3 fundraising campaign, #OneAlumnusOneStudent Fundraising Campaign for online learning resources, Students' Pan IIT Alumni Relations Cell (SPARC) initiatives, IITK SwellCast, Alumni Reunions, PAN IIT USA Presentation and Alumni Association Membership Awareness.

Campus Front: Events in this front were:

That's IITK Blog on Quora: A very comprehensive report on the quality and diversity of blogs currently present on That's IITK blog page on Quora has been prepared.

Online Cryptic Events: Legacy Hunt:Organized a first-of-its-kind online competition themed on prominent alumni of IITK, witnessing participation of approximately 50 teams each consisting of 3-5 participants each.

Future Alumni Database: Scripted a basic web scraper to automatically collect data of approximately 16000 registered students (Y10 onwards) from the Office Automation's database.

Gymkhana Corpus: Drafted a proposal for the formation of Gymkhana Corpus based on DORA's views on the same.

Other Events include:

Gymkhana Brochure, Ideation Accelerator Program for Pre-seed Startups, Y20 Counselling Campaign, Tips from The Top, Freshers' T-shirts and Fundraising for IITK Workers.

Social Media and Website:

Outreach Cell LinkedIn and Facebook pages- Initiative to publicize the events being conducted by Outreach Cell among the whole campus community.

Creation of a fully updated Website for Outreach Cell- The website based on HTML5 and CSS was created for the Outreach cell. Further, work is being done on accommodating the blogs for interviews with different Alumni on the outreach cell website.

Students' Senate

The main policy drafting body of the Students' Gymkhana worked on and legislated various policies this year. Major items and agendas that were taken up are mentioned below:

- Organized Open Houses for the PhD students and the students of the graduating batch
- Considered the proposal for Election Awareness
- Considered the establishment of an "EBSB" Wing in the Media and Cultural Council
- Considered the proposal for Senior Class Gift Program
- Considered the long pending Journalism Ethics and Standards Document for Vox Populi
- Considered a one-time course swapping proposal for the Y16 Dual Degree students
- Considered a one-time credit limit extension proposal for the Y16 Dual degree students

- Considered a proposal regarding DC lab courses of the Y17 batch
- Considered a proposal for credit/course waiver for final year students
- Considered but rejected a proposal to reconsider the fees structure for the 2020-21-II semester due to the logistical constraints present
- Considered a proposal regarding the office order DOSA/2019/OO/06/715 affecting the policies of the Students' Gymkhana
- Considered the proposal for the introduction of Gymkhana Award for All-Round Performance
- Considered the long pending proposal regarding the Media and Publicity of the Students' Senate
- Considered the formation of a sub-committee to discuss online election procedures for the year 2020-21
- Considered the proposal on user-friendly facilities for differently abled students
- Considered the proposal regarding the widening of the path from Academic area gate 3 to L20
- Considered the proposal for the Introduction of Departmental Mentors
- Considered important amendments in Appendix A and the Constitution regarding the accountability of Senators

- Considered a proposal for an Alumni Connect Portal
- Considered the proposal for a Course Review and Resource Portal
- Considered the proposal to restructure the section 'References' in the Convocation Award Forms
- Considered the Model Constitution
- Considered the proposal for Hall 13's HEC structure, election and functioning
- Considered the formation of Humor House Hobby Group under the Media and Cultural Council
- Took up the queries and issues of PG students residing in campus separately
- Considered the proposal for a One-Stop Information Webpage
- Considered the proposal for setting up a Campus Discourse on the Students' Gymkhana Website
- Considered changing the name of 'Debate and Discussion Society' to 'Debating Society'
- Considered the proposal to promote Students' Opinion Society to a full-fledged Public Policy and Opinion Cell
- Considered the issue of Y18 CHM UG Summer Labs

Media and Cultural Council

The Media and Cultural Council of the Students' Gymkhana is the epitome and embodiment of the 'Culture of IIT Kanpur'. Comprised of over 15 clubs and societies, the highlights of this year were:

Freshers' Showcase: A three-hour-long YouTube Premiere event was organized for the Y20 students which witnessed the participation of more than 400 students from all the M&C Clubs and societies.

Council T-shirts: Council T-shirts were launched through social media handles, process to buy t-shirts were circulated over mail to the campus community.

Govt. Events: Events like Azadi Ka Amrut Mohatsav, Celebration of National Education Day etc. were organized as directed by the institute authorities. These events witnessed adequate participation.

Conduction of events in genres that are not incorporated into clubs:

Fashion and Lifestyle: Two events were conducted in Fashion and Lifestyle genre witnessed significant participation from students. A seminar named Fashion x Tech Sustainability Talk was also organized in August.

Comedy: Humour House IITK, a group of students were mentored by Associate Heads to promote comedy and humour content in the student community.

Culinary Arts: As part of Diwali extravaganza, they conducted an event under culinary arts as this genre was untouched in the campus but several IITs have established bodies that cater to this genre.

Policy Conclave'21: Policy Coclave'21 was held virtually from 9th to 11th April 2021. It consisted of several sessions to be delivered by notable personalities, workshops on Public Policy Research and UPSC preparation. Besides this, several competitions were hosted based on Policy Research-Lok Niti, Political Consulting Case Study- Rajneeti, Unscripted, Policy Cipher.

CCA: Compulsory Cultural Activity (CCA) was not incorporated this year for first year students due to covid. This can possibly lead to an information gap among further generations, this can be prevented by including online mechanism of CCA for Y21 students if they too have their academic curriculum online, else if offline, CCA should be continued as it used to be.

ACHIEVEMENTS:

- ✓ Many inter club collaborations were made which proved to be highly beneficial and were a benchmark achievement since it was desired since a long time in the council. Council also collaborated with Antaragni for conduction of one of their comedy nights.
- ✓ Anime Society initiated Anime podcast in which a group of people would discuss anime and present their opinions. They released two podcast episodes on Spotify and YouTube.
- ✓ Dance Club successfully participated in the Group Dance Event conducted by IIIT Hyderabad. We won Round 1 with the **highest** number of likes on Youtube and received a **special** mention in the Final Round. Two solo entries were also submitted for the Solo Event in which Devansh Dutt secured **2nd** position.
- ✓ Photography Club conducted a series of online discussions with inspiring photographers, to learn about their journeys and their work. The club conducted 3 such sessions with Mr. Dinesh Khanna, Mr. Craig Reilly, and Mr. Shobhit Tiwari. 4-week workshop Pixels 2.0 covered topics like Basic and Advanced Composition, Technical Aspects like Aperture, ISO and Shutter Speed, Colour Theory and Basic Post Processing.

- ✓ Quiz Club started a Discord server with the start of the term and used it to both make and conduct quizzes. They called an external quizmaster and the conduction of one quiz was delegated over. They also collaborated with India Fact Quiz.
- ✓ Design and Animation Club:
    1. Collaborated with Agnys Waste Management Pvt. Ltd. for a Product Explainer Video (Product: SURANG, Collaboration certificate)
    2. Collaborated with a Y17 (Sunit Gautam) for Branding (App UI, Logo, Flyers, Explainer video) their Start-up (Product: Swachta Mitra)
    3. Collaborated with Nikhil for a Mobile Application UI and Logo Design named FIT Khildai
- ✓ Dramatics Club conducted a webinar with actor & writer **Brijendra Kala** regarding his journey and theatre ethics. They held parties of Previous Nukkad or Monologues or Stage Plays on an online streaming platform and analyzed the flow and facts shown and how and why such scenes were created, their effects, and the relevance of the current society's topics.
- ✓ Students Opinion Society brought a replica to the Parliament structure with its event **'Sansad'**, which helped to get an essence of the procedures in our Parliament and Indian politics in general. UPSC talks

was a highly successful series that observed an audience exceeding 150 in every session.

- ✓ Fine Arts Club created a discord server specially for the Fresher's to post their artworks and get feedback more conveniently. People used it to give suggestions to each other/appreciate each other's' work.
- ✓ Debating Society's results in national/international University debating tournaments:
    1. JUST DC Open - Semi Finalists
    2. CDPT 2020 - Finished 2nd, 7th Best Speaker
    3. Sumatra Open - Novice Finalists
    4. DSDC Coherence 2020 - Quarter Finalists
    5. Sri Visveswarya Memorial PD - Novice Semi Finalists
    6. IIT Delhi PD - Octo Finalists, Best Novice Speaker
    7. DTU PD - Quarter Finalists, 5th and 8th Best Overall Speakers, Judge Break
    8. Sri Ram Debating Festival - 3rd Best Overall Adjudicator, Judge Break
    9. BITS Pilani Parliamentary Debate - Quarter Finalists
- ✓ English Literary Society:
    1. Secured 2nd position in Inter IIT Scrabble League conducted by IIT Bombay

2. Secured 3 positions in Top 12 in Poetry Slam with the highest being 2nd (out of 34 participants). One position in Top 10 in Creative Writing (out of 74 participants) in the Antaragni'20 online events
3. Secured the 1st position at Literati word games and finalists in Literati creative writing, Saarang scrabble and word games.

✓ Hindi Sahitya Sabha:

1. MoodI Poetry Competition: 1st Prize
2. Vayam(Organized by IITBHU) Poetry Competition : 1st Prize
3. Antaragni Hindi Poetry Competition: 2nd Prize
4. Antaragni Story Writing Competition: 2nd Prize
5. Teekhar Literary Quiz: 2nd Prize

Humour House conducted RANDOM CHUNAAV in which students made mock manifestos which received a tremendous number of entries and responses. 40+ entries were released from the page and some of them were liked by 500+ people and share by 100+ peoples. Also, the event boosted the reach of the page significantly.

✓ Music club:

Few club members participated in the musical events of the annual cultural festival of IIIT Allahabad, Effervescence.

The club member and former Coordinator, Dhruv Mittal, secured an international rank of 5 in the Gruv Challenge that was held via Instagram.

1. Their present Coordinator Shreyasi Roy Choudhury was invited to judge Fitoor, India's Online Musical Carnival, which was conducted by the Youth India Foundation.
2. Few members also participated in Materials Advantage - Music events conducted by MSE, IITK.
3. Their online initiatives received widespread appreciation, and we were featured amongst top Indian Music bands for our official music releases on Spotify by the Indian Music Diaries on a Discord Podcast in October.
4. They were featured on the Community Page (@tetcommunity) linked to the Official Instagram Handle of The Education Tree (@theeducationtree) (83.1k followers).
5. Three of their club members (Sankalp, Namgyal, and Vinoba) qualified for the finale of three different events in the cultural festival of IIM Bangalore, Unmaad.

SCIENCE AND TECHNOLOGY COUNCIL

The Science and Technology council has witnessed a remarkable year setting many milestones along the way. SnT Summer Camp 2020 was successfully completed with more than 40 projects and 500+ students. The camp was conducted in an online mode, for a stretch of 60 days. Lectures and workshops were taken by several clubs and societies. There were mid-term and end-term evaluations conducted by the Ex-core team of Science and Technology council.

9th Inter IIT Tech Meet - IIT Guwahati

We take immense pleasure in informing you that IIT Kanpur has won the 9th Inter IIT Tech Meet. This was the first edition of the Techmeet held virtually. Winning after a long and desperate wait of 4 whole years for any Inter IIT trophy, we have now become the only IIT to have won 4 Tech Meets in total. IITK bagged 3 gold, 3 silver and 3 bronze medals out of the 11 events conducted.

Conducted online events

1.Jigyasa 2020- 6 clubs and societies have conducted their sessions with significant participation of around 250+ students.

2.Online SnT code- It was a 24-hour long event, with participation of more than 600 students.

3.Techweek'20- It was a week-long event, with more than 650 freshers participating in 10+ events

Institute SnT Teams

Team IITK Motorsports participated in 2 National Events.

ERA IITK started work on robomaster robotics competition- "the world's biggest, most complex and completely over-the-top student robotics competition " according to verge magazine.

Council Activities for Campus Students

The council has grown to 7 Clubs, 5 Societies, 6 Institute S&T Teams and 2 Wings. They organised first time online orientations, several lectures and workshops on topics ranging from finance and consulting to Game development, thus covering every aspect of students' interest fields.

FinFest

A collaboration competition with the Finance, Economics and Business Clubs of IIT Bombay, Kanpur, Guwahati, Delhi, Roorkee and Varanasi.

Yearbook Portal

This project was taken up by the Web Division this year. Online Yearbook portal was created for the Y16 batch, as well as the yearbook. We will be saving around Rs. 2 lakh every year, with more flexibility and features in the in-house model.

Flipkart Grid 2.0

2 teams of 5 members each participated in the Flipkart Grid 2.0 Robotics, one of the teams qualified till the last level.

Joining hands with the Institute:

All these achievements were made possible with collaboration among the student body and the institute administration in terms of the financial and logistic aid provided.

ACADEMICS AND CAREER COUNCIL

Career Development Wing

Digital Newsletters have been published; webinars conducted in association with flinkhub on various job profiles. We published a blog series aiming to help students in their preparation for internships and curated information to create a placement guide that entailed information about most companies coming for placements.

Demux Academy

Remote Internships: NGOs and StartUps were contacted to offer remote internships to the students. Up to 12 NGOs were able to provide internships for students, amounting to 36 internship opportunities.

Ideathon in collaboration with Enactus: A case study hackathon was conducted in collaboration with Enactus. Problem Statements were based on some challenges we face on our campus. Department and profile-wise videos from seniors were released to highlight the preparation strategies, hosted Mock Test series for helping students prepare for the internship season. Created a guide to address the basic career awareness needs of the students. A session was conducted by this wing on corporate internships for the second year with speakers from Y18 who could secure one in their second year.

Establishment of IAESTE (iaeste.org | iaeste.in), databasing for academic scholarship programs and national and international research internship programs have been done. Plan to compile a list of study material for GRE General and Subject Tests, Toefl, and GMAT and upload it on our wing's webpage.

SURGE 2020 was successfully conducted in online mode for IITK as well as non-IITK students. The wing conducted an introductory session with past SURGE participants of Y18 and Y17 batch, to make aware Y19 batch students' various opportunities available in the Search Program/

The wing organized the 4th edition of Students' Research Convention (SRC'21) on 27th - 28th March 2021 with the aim of promoting an inclination towards research.

Revamped OIR Website: Developed advanced features on the website such as Automatic Excel to the Webpage data update feature, through which any updates in the list of MoUs, Student Exchange Programs, and Programs for Faculty.
A session on 'The Skill or Writing a Research Article and Selection of Journals*" and* One day workshop on "Introduction to Finite Element Method Analysis using ABAQUS" was organized.

International Relation Wing

- A Get to Know Session for the **Postdoc opportunities**:
  We, International Relations wing organized a get to know session for the Postdoc opportunities after PHD on 18th Oct. 2020 by zoom & YouTube live. That session was attended by more than 500 students on YouTube live. The recording

of this session is also available on our PG ANC YouTube channel.

- We are arranging regular meetings with all the DPGC students' nominees & solving their quires on WhatsApp group as well as in the group Meetings.
- A session on the **foreign/semester exchange program** on 17 Nov. 2020 more than 1000 students have attended the session on YouTube live.

Games and Sports Council

The Games and Sports Council, IIT Kanpur has always been about striving towards mental and physical fitness and about providing and maintaining the right environment for nurturing one's skills in the sport of their choice. Over the past year, a variety of events were organized with the same purpose in mind.

WININDIA played a crucial part in helping the students of not only IITK but all other IITs as well, maintain a fit and healthy lifestyle. All IITs showed a united front through this online campaign mentored by none other than Mr. Sunil Shetty.

The Adventure Sports Club

The Chess Club has been one of the most active clubs, organising events like Blitz Battle 2.0, IITK New Year Chess Tournament, throughout the year.

The initiatives undertaken by the **Taekwondo Club** are worth mentioning. It organised Self Defence Workshops, and followed it up with regular Online Taekwondo Classes later shifting to Offline Classes as well.

The Cards and Board Games Club has gained an even greater importance thanks to the online semester. They organised an Open to all Online Poker Tournament. As part of the Fit and Fun Week CBG conducted online poker and codewords games. Gaming nights were also organised with games like “Settlers of Catan” and Codewords being played.

The Boxing Society expanded exponentially over the course of a few years. During the past year they conducted Boxers in the Quarantine Challenge in which the boxers were asked to share their 30 sec videos of how they were thriving in the lockdown.

The E-Sports has been one of the most important council activities during the pandemic, the Institute PUBG League or the COD League, engaged the students. Valorant and Clash Royale fans also turned up. A special mention must be made of the amalgam of all such games, The College Premier League.

The Council also organised sessions for the mental well-being of the students. The Four Pillars of Wellness was conducted successfully with the guest speaker being Mr. Navin Hettiarachchi, the Director of Health, Wellness & Performance at National Basketball Association (NBA), Washington. A Webinar-Maintaining Mental Well-Being during Covid-19 was organised which

saw Ms. Eisha Chopra (Actor, Writer and Mental Health Activist) conversing with Dr. Sneha Sharma (MD Psychiatry, Co-Founder, reDockto).

Breaking the social stigma regarding periods, Ms. Chandni Gambhir spoke about the ways to maintain sustainable menstrual hygiene specially for sportswomen in a **Webinar-Sustainable Menstrual Hygiene.**

A Fit and Fun Week was conducted which consisted of fun challenges which also tested your fitness. The Council launched and conducted the “A Note on UCL” series as well as the “IPL: Chai Pe Charcha” series. The IPL: Chai Pe Charcha event saw a lot of participation and contests like the Meme contest, the Sarcastic Comment Contest, the Art Contest and Quizzes were conducted successfully in collaboration with clubs.

Aagaz was conducted online this time around, studded with events like Virtual Athletics Funathon, Mr. and Miss. Aagaz, Chess Extravaganza, Quizmania.

IIT Kanpur collaborated with Piramal Group to raise funds for living beings struck hard by Covid-19. This initiative included two sessions, one exclusively for fund raising and the other for

Yoga postures, the fund raised from which was used by NGOs to help stray animals facing brutality.

The Old SAC Stadium was renovated with new equipment being bought for the gym and women athletes.

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 Head, a team of professional counsellors, psychiatrists, a group of student volunteers dedicated towards the welfare of the student community and staff members. Currently, there are 5 professional counsellors and 2 psychiatrists who regularly visit the Institute.

The student team comprises an undergraduate wing and a postgraduate wing. The UG wing has 5 coordinators, 10 core team members (operations) and 11 core team members (Academics). The UG wing has 219 student guides and 134

academic mentors whereas the PG wing has 7 Core Team members.

Counsellor and Psychiatrists' Sessions

Students typically meet the counsellors in two modes – they sometimes approach the counsellors 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 counsellors for relief.

The psychiatrists typically visit the campus at least once a month. If the need arises, then they visit more often. In pandemic psychiatrists are providing online consultation. 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 Counsel- ling Service.

Counselling Service has taken several initiatives in the direction of well-being of students' mental health. Counselling service had started Tele-Counselling and Video-Counselling sessions to aid students during the pandemic. To help students cope with mental health issues in the online semester various sessions/talks were conducted in online mode. For spreading awareness, self-help videos had been uploaded on the CS website on regular basis. The team organized significant events such as Safar Nama: A video series of discussions with alums

to inspire their young generation, Run Fest: A running competition conducted in online mode using the STRAVA app. These programs have had a lot of impact on the community.

Financial Assistance

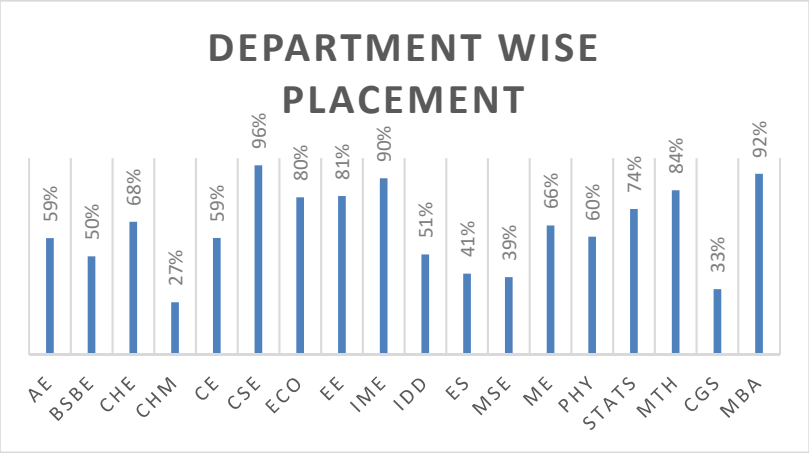
Through the Students Benevolence Fund (SBF), the Counselling Service provides financial assistance to needy students in the form of scholarships. This is available for those financially needy students, who have been unable to acquire any other financial assistance from the institute. The SBF scholarship is Rs. 1,500 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

1,135 students had registered with Student Placement Office for Campus Recruitment Drive 2020-21. As with the previous years, recruitment drive for the academic year 2020-21 was held in two phases. Phase-1 of the recruitments officially started on December 1, 2020 and ended on December 9, 2020 (total of 9 days). In Phase-1, approximately 232 recruiters hired students for full time employments. About 45 top tier firms with 60 different profiles from various sectors conducted interviews on Day 1, when an unprecedented 232 job offers were

extended, and 209 of those were accepted by IIT Kanpur students. Based on hiring numbers, the top recruiter for this placement season is Microsoft India Pvt. Ltd. which hired 28 students. Other top recruiters of the season were Intel Technology India Pvt. Ltd. (22), EXL Services (18), ICICI bank (16), Goldman Sachs (15), Axis Bank (14) etc. Phase-2 of the recruitments started in January 2021 and was continued till June 2021. Till June 2021, a total of 308 organizations took part in the campus placements and made 813 job offers made to IITK students.

A summary of department wise placement record for the current season is shown in the Figure below.



Placement across various departments of IIT Kanpur during placement season 2020-21.

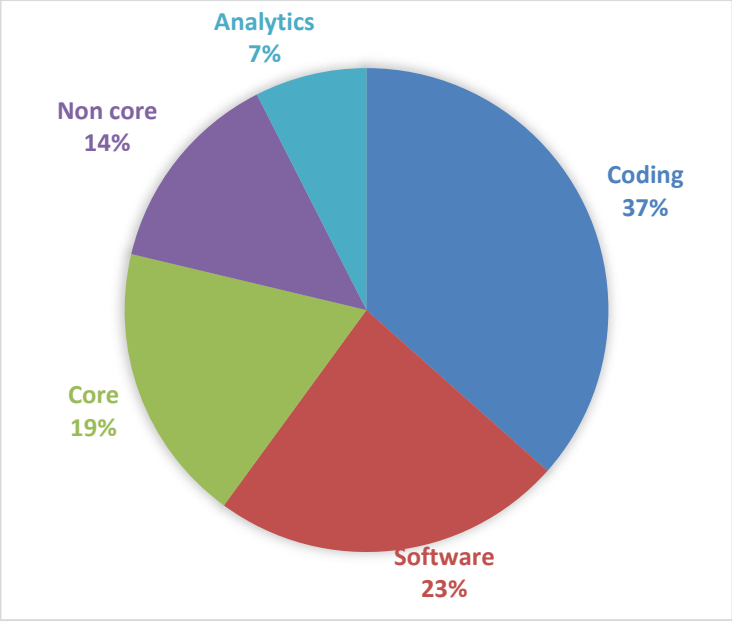
A total of 813 students (out of the 1,135 registered students) were placed through SPO during the academic year 2020-21. Despite the pandemic, the overall placement stood at 72%, on account of the dedicated efforts of the SPO team. This includes students in both UG and PG levels. 417 out of 517 registered students in B. Tech and B.S. degree programs (approx. 81%) were placed during the season. UG placement count also includes 108 accepted PPOs extended to them as part of academic internship provided through SPO.

Amongst the various post graduate programs, Master of Design (M. Des.) where 92%, MBA where 92%, and dual degree program where 83% of the students got placed during the current placement season.

Students of IIT Kanpur continued to demonstrate a strong commitment to their core educational background in their choice of employment Placement drive witnessed highest participation from coding and software firms (60%) whereas 19% core firms also strongly contributed.

Some of the top recruiting firms that visited IIT Kanpur for hiring students in core engineering sector include Intel, Cisco System,

Schlumberger, Eaton, L&T Constructions, Tata Steel, Tata Motors, Jindal Stainless Limited, HPCL etc. This trend observed in the last few years seems to have taken strong roots at IIT Kanpur Coding/Software sector also witnessed a rush of top and mid-level companies visiting campus with a variety of profiles that are open for students in diverse disciplines. A summary of sector wise placement record for Y2020-21 is shown in the below figure.



Overall placements were highly satisfying in terms of placements at IIT Kanpur despite the pandemic blues. The entire placement process was conducted online.

EPILOGUE

Dear graduates, on this occasion of the fifty fourth convocation, I am immensely happy to congratulate you on your accomplishment. I also take this opportunity to acknowledge your parents for playing a vital role in moulding their daughters/sons and encouraging them to reach this stage. My heartiest congratulations to all award and medal winners!!

I am extremely delighted to see many of you attending the convocation in person and celebrating your success with us. Today, after you leave your alma mater, you will select the profession of your choice that brings you satisfaction both on personal and professional fronts. I ardently hope that each one of you would succeed in all your future endeavours.

Today, you will be leaving the secured surroundings of the institute to seek your place in the bigger society. This involves the assessment of the demands of people and responding to their needs. The skills acquired from this institute should be emulated in your ingenious application of science and technology to benefit the society and your country. You should continuously strive for excellence in both social and professional domains. Always help others in time of need. Discover your own slogan to generate wealth for the betterment of the society. Whatever

be your chosen profession, remember that excellence and integrity should be your guiding principles.

With great pride I am happy to share that some of our students have benefitted from the “Student Entrepreneurship Policy” of our institute. This policy was aimed at encouraging the young minds to become successful entrepreneurs. Thus, I urge each one of you to imbibe this and be “the job-givers instead of job-seekers”. As Dr. APJ Abdul Kalam famously said, “You have to dream before your dreams can come true”. So, dear students, continue to dream big and keep your flag flying high!

Dear Graduates of 2021, I applaud each one of you for your excellent achievements during your stay at IIT Kanpur. Always remember - you are very privileged and fortunate to have received the best education in the country and now it is your time give back to our society and nation. Stay in touch and enhance the glory of your alma mater wherever you go! My heartfelt good wishes for your future.

Jai Hind!!

Abhay Karandikar

BOOKS PUBLISHED

1. Acoustic analysis and design of short elliptical end-chamber mufflers, Akhilesh Mimani (ME), Springer Nature, Singapore, 2021, ISBN: 978-981-10-4828-9
2. Build and Sustain a Career in Engineering, Anindya Chatterjee (ME), Notion Press, ISBN 978-1637816233.
3. Foundations of Space Dynamics, Ashish Tewari (AE), John Wiley & Sons, Chichester, U.K., 2020, ISBN: 978-1-119-45534-9.
4. Liquid Crystalline Polymers, Kamal K. Kar (ME), Lie Zhu (Case Western Reserve University, USA) and Christopher Li (Drexel University, USA), Springer Nature Switzerland AG, 2020, ISBN: 978-3-030-43350-5.
5. Religion and Secularities: Reconfiguring Islam in Contemporary India, Sudha Sitharaman (Department of Sociology, Pondicherry University), Anindita Chakrabarti (HSS), Orient Blackswan, 2020, ISBN 978-9390122004.
6. Analog Communications: Problems & Solutions, Kasturi Vasudevan (EE), Springer Nature Switzerland AG, 2021, ISBN 978-3-030-50337-6.
7. Handbook of Nanocomposite Supercapacitor Materials: II Performance, Kamal K. Kar (ME), Springer Nature Switzerland AG, 2020, ISBN 978-3-030-52359-6.
8. Drop dynamics and dropwise condensation over textured surfaces, Sameer Khandekar (ME) and K. Muralidhar (ME), Springer (New York), 2020, ISBN 978-3-030-48463-7.

9. Intelligent Control of Robotic Systems, L. Behera (EE), Swagat Kumar (EE), Prem Patchaikani (EE), Ranjith Nair (EE), Samrat Dutta (EE), CRC press, 2020, ISBN 9781138597716.
10. Computational aerodynamics and acoustics, T. K. Sengupta (AE), Y. G. Bhumkar (IIT Bhubaneshwar), Springer Nature Publication, 2020, ISBN 978-981-15-4284-8.
11. Handbook of Nano composite Super capacitor Materials: I Characteristics, Kamal K. Kar (Editor) (ME), Springer Nature Switzerland AG, 2020, ISBN 978-3-030-43009-2.
12. Simulations and Optical Diagnostics for Internal Combustion Engines Current Status and Way Forward, Avinash Kumar
13. Agarwal (ME), Springer Singapore, 2020, ISBN 978-981-15-0335-1.

FELLOWSHIPS

1. Prof. S. N. Tripathi (CE) has received the prestigious J. C. Bose Fellowship for a period of 5 years.
2. Dr. Ritwij Bhowmik (HSS) is awarded the prestigious Fulbright-Nehru Academic & Professional Excellence Fellowship 2020-21.
3. Prof. Gautam Biswas (ME) is awarded an extension for a period of 5 more years for the J. C. Bose fellowship based on his outstanding performance.
4. Dr. Arun K. Shukla (BSBE) has been selected for the Senior Fellowship of the DBT Wellcome Trust India Alliance.

5. Dr. Bushra Ateeq (BSBE) has been awarded Senior Fellowship in Basic Biomedical Research category from the DBT Welcome Trust India Alliance.
6. Dr. Arjun Ramakrishnan (BSBE) has been selected for Ramalingaswamy Fellowship.

AWARDS AND HONORS

1. Dr. Abheejeet Mohapatra (EE) has received the INAE Young Engineer Award 2021.
2. Prof. Yashowanta Narayan Mohapatra (PHY) and Prof. Parasar Mohanty (MTH&S) have received the Distinguished Teacher Award for the year 2021.
3. Dr. Arun Kumar Shukla (BSBE), has received the Shanti Swarup Bhatnagar Prize (SSB) for Science and Technology 2021 in Biological Sciences.
4. Prof. Yogesh M. Joshi (CHE), has been awarded the prestigious Academy Excellence Award 2021 of the Defense Research and Development Organization (DRDO).
5. Prof. Santanu Mishra and his team received the First Place Prize Paper Award 2020 by the Editorial board of IEEE Transactions on Power Electronics (Letters) for their paper, DC-DC Converter Synthesis: An Inverse Problem.
6. Dr. Ajay Vikram Singh (AE) and his students have received the best paper award in the 2nd International Conference on Recent Advances in Fluid and Thermal Sciences (ICRAFT 2020) held during 19-21 March 2021 in Dubai, UAE.

7. Prof. Sandeep Verma (CHM) has been chosen for the A.V. Rama Rao Technology Award 2021, instituted by CSIR Indian Institute of Chemical Technology in collaboration with AVRA Laboratories Pvt. Ltd, Hyderabad.
8. Dr. Kaustubh Kulkarni's (MSE) paper in JMR has been selected for 2020 Gordon E. Pike Prize for the JMR Paper of the Year.
9. Dr. Joydeep Chakrabortty (PHY) has been awarded the DIVA award from the Institute of Particle Physics Phenomenology at Durham University.
10. Dr. Bushra Ateeq (BSBE) has been selected for the S. Ramachandran - National Bioscience Award for Career Development for 2020-2021 from DBT.
11. Prof. Vinod K. Singh (CHM) has been selected to receive the "TWAS Regional Award - 2020 for Building Scientific Institutions".
12. Dr. Hamim Zafar (CSE) has been selected to receive the Har Govind Khorana-Innovative Young Biotechnologist Award (IYBA) 2020 from the Department of Biotechnology India.
13. Prof. Dipak Mazumdar (MSE) and his students have received the prestigious 2020 Sail gold medal for the best paper published in the Transactions of Indian Institute of Metals during the year 2019.
14. Dr. Sudhanshu Shekhar Singh (MSE) has been selected for the NASI-Young Scientist Platinum Jubilee Award in Physical Sciences, for the year 2020.

15. Prof. Mukesh Sharma (CE) has been awarded the “Air Quality Research Lifetime Achievement Award” for the year 2020 at the Indian International Conference on Air Quality Management (IICAQM).
16. Prof. Sankar P Rath (CHM) and Prof. D. Dethe (CHM) have been selected for the SERB Science and Technology Award for Research (SERB-STAR).
17. Prof. S. C. Srivastava (EE) received the IEEE IC Lifetime Achievement Section Chair Award 2020 for his outstanding ontributions to the IEEE Uttar Pradesh Section and India Council.
18. Dr. Mohit S. Law (ME) has been elected for the “Gopal Das Bhandari Memorial Distinguished Teacher Award” for the year 2020.
19. Dr. Arijit Ganguly (MTH&S) has been elected for the “Sushila and Kantilal Mehta Award” for the year 2020.
20. Dr. Bushra Ateeq (BSBE) has received the Shanti Swarup Bhatnagar Prize (SSB) for Science and Technology 2020 in Medical Sciences.
21. Prof. S. P. Rath (CHM) has been awarded Prof. R S Varma Memorial Award for the year 2020 by Indian Chemical Society.
22. Prof. Shantanu Bhattacharya (ME) has received the IETE R. S. Khandpur award for 2020 for his research contributions in domains related to medical devices for detection and sensing.
23. Dr. Rahul Mangal (CHE) has received the INAE Young Engineer Award 2020.

24. Prof. Animesh Biswas (EE) has been chosen for IETE - Ram Lal Wadhwa Award for the year 2020 for outstanding original contribution in the field of electronics and telecommunication engineering during the last ten years.
25. Dr. Indra S. Sen (ES) has received the Young Researcher Award in the field of Earth System Sciences 2020.
26. Prof. Subhas C Misra (IME) has been awarded SuJSS Finalist Most Influential Paper Certificate by the Journal of Systems and software (Elsevier).
27. Prof. Nitin Gupta (BSBE) has been awarded the prestigious Swarnajayanti Fellowship in Life Sciences from the Department of Science and Technology (DST), Government of India.
28. Dr. Dootika Vats (MTH&S) has been awarded the Blackwell-Rosenbluth Award by j-ISBA (junior-International Society for Bayesian Analysis).

APPOINTMENTS

Prof. Mukesh Sharma (CE), has been appointed as an honorary non-remunerative member of the World Health Organization (WHO) Global Air Pollution and Health - Technical Advisory Group (GAPH-TAG).

EDITORSHIPS / MEMBERSHIP

1. Prof. Kantesh Balani (MSE) , Prof. Saikat Chakrabarti (EE), Prof. V Shankar (CHE), Prof. Yogesh Singh Chauhan (EE) and Prof. Sandeep Verma (CHM) have been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2021.
2. Prof. Nitin Saxena (CSE) has been elected as a fellow of Indian Academy of Sciences (IASc).
3. Dr. Indra Sekhar Sen (ES), has been appointed as an Associate Editor of Geophysical Research Letters for a period 3 years.
4. Dr. Nilesh Umesh Badwe (MSE), has been appointed as an Associate Editor of the Journal Microelectronics Reliability.
5. Prof. R. R. K. Sharma (IME), has been invited to join the Editorial Board of the Journal Cloud Computing and Data Science (CCDS) published by Universal Wiser Publisher, Singapore.
6. Dr. Amar Agarwal (ES), has been selected as an Associate for the Indian Academy of Sciences, Bangalore.
7. Prof. Sachchida N. Tripathi (CE), has been invited to join the Advisory Board of the Journal Environmental Science: Atmospheres, published by the Royal Society of Chemistry.

8. Dr. Prakash Chandra Mondal (CHM), has been invited to join the advisory board of the Journal Analyst that is published by Royal Society of Chemistry.
9. Prof. Kantesh Balani (MSE), has been elected as a Fellow of the ASM International Society in the year 2021.
10. Dr. Anjali Kulkarni, Principal Research Engineer of Mechatronics Lab has been appointed as an Editorial Board Member of the Journal of Micromanufacturing published by SAGE publication's.
11. Prof. Kamal K. Kar (ME) has been invited to serve as a Member of the Advisory Board of Journal SPE Polymers, Wiley Publications.
12. Prof. Malay Banerjee (MTH&S) has been invited to be an Editorial Board member of the Journal Applied Mathematics and Computation (Elsevier).
13. Dr. Subhra Sankar Dhar (MTH&S) has been invited to be an Associate Editor of Sankhya-Series A.
14. Prof. Kamal K. Kar (ME) has been invited to serve as an Associate Editor for the Journal Applied Nanoscience (Springer Nature).
15. Prof. Sandeep Verma (currently on deputation as Secretary, SERB) (CHM) has been invited to serve as a Member of the Editorial Advisory Board of Journal ChemBioChem, Wiley Publications for a period of five years.
16. Prof. Jonaki Sen (BSBE) has been invited to join as a member of the Editorial Board of Reviewers for the Journal Developmental Dynamics, Wiley Publications.

17. Dr. Basker Sundararaju (CHM) has been invited to join the Editorial Board of the Journal Organometallic Catalysis as Review Editor.
18. Prof. S. C. Srivastava (EE) has been elevated to IEEE Fellow, effective 1 January 2021.
19. Prof. Yogesh S. Chauhan (EE) has been elevated to IEEE Fellow, effective 1 January 2021.
20. Dr. Indra Sekhar Sen (ES) has been appointed for a period of three years on the Editorial Advisory Board of the Journal Environmental Science and Technology.
21. Prof. Kumar Ravi Priya (HSS) has been awarded a book series contract for the role of General Editor. The title of the book series is Critical and Qualitative Approaches to Mental Health Experiences among Vulnerable Groups by Routledge (Taylor & Francis), United Kingdom. The series will feature publication of 11 books over a period of next 6 years.
22. Prof. S. N. Tripathi (CE) has been elected as the Fellow of Indian National Science Academy (INSA).
23. Prof. Dipak Mazumdar (MSE) has been invited to the advisory board of ISIJ (Iron and Steel Institute of Japan) International for a period of 4 years from 2021.
24. Dr. Prosenjit Roy (MTH&S) has been selected as an associate of Indian Academy of Sciences, Bangalore.
25. Prof. Krishanu Biswas (MSE) along with Prof. Jeff de Hosson (The Netherlands), Prof. J. W. Yeh (Taiwan) and Prof. P. P. Bhattachajee (India) have been invited by Acta Materials Inc to edit a special issue (View Point set) on High Entropy Alloys.

26. Prof. S. N. Tripathi (CE) has been appointed for a period of three years, on the Editorial Advisory Board of Environmental Science and Technology Letters (IF 6.94), a top tier journal published by American Chemical Society.
27. Prof. Nishchal K Verma (EE) has become an Associate Editor of IEEE Transactions on Neural Networks and Learning Systems for the year 2020.
28. Dr. Bushra Ateeq (BSBE) has joined as a Section Editor (Co-editor-in-chief) for the Journal Translational Oncology (Elsevier).
29. Prof. Jayandharan Rao (BSBE) has been invited to join as an Associate Editor of Journal of Cellular and Molecular Medicine (JCMM) published by Wiley. He has also been invited be a member of Editorial Boards of two journals, Cancer Gene Therapy (CGT) (Nature Publishing Group) and Human Gene Therapy (HGT) (Mary Ann Liebert Inc. Publishers).
30. Dr. Arun Shukla (BSBE) has been invited to join the Editorial Board of the following journals: Cell Reports (Cell Press), FEBS Journal (Wiley), International Journal of Biochemistry & Cell Biology (Elsevier), European Journal of Cell Biology (Elsevier) and European Journal of Pharmacology (Elsevier).

STUDENTS' AWARDS

1. Sujit Kumar Muduli (PhD/CSE) and Gourav Takhar (PhD/CSE) were awarded the "IEEE/ACM William J McCalla Best Paper Award" in the front-end category in IEEE/ACM International Conference on Computer-Aided Design (ICCAD 2020). The paper was titled "HyperFuzzing for SoC Security Validation".

2. Ayesha Nanda (PhD/PHY) received the “Best Oral Presentation Award” in the 8th PSSI-Plasma Scholars Colloquium (PSC 2020) held online on October 8 - 9, 2020, organized by Plasma Science Society of India (PSSI) in association with Kalinga Institute of Industrial Technology (KIIT) Deemed to be University, Bhubaneswar, Odisha, India. Ayesha was awarded for her work on "Electrical conductivity in dipole plasmas", where she obtained new results in modifying the conductivity tensor in a dipole magnetic field.
3. Hilal Ahmad Pal (PhD/CHM) was awarded “SAILIFE-NOST Best Thesis Award-2020” through a national call. The award included a monetary prize and a citation.
4. Sushanta Barman (PhD/PHY) won a Poster Award in the 4th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2020), held during October 26 - 31, 2020. The title of his poster was "Observation of Nonlinear Demagnification in Plasma-based Ion beam Optics".
5. Deepika (PhD/PHY) won a poster award in the 4th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2020), held during October 26 - 31, 2020. The title of her poster was "Characterization of Fluctuations in Atmospheric Pressure Micro-Plasma Jets".
6. Swati Swagatika Mishra (PhD/PHY) won a poster award in the 4th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2020), held during October 26 - 31, 2020. The title of her poster was "Molecular Dynamics Simulation of Collisional Cooling of He and Its Binary Mixtures with Ne, Ar, Kr and Xe in Nose-

Hoover thermostat for Creating Strongly Coupled Cryo-plasmas".

7. Aman Mahajan (PhD/BSBE) won the "Bajpai-Saha Student Award" for the best student paper presented in the 30th Annual Conference of the Society for Biomaterials and Artificial Organs India (SBAOI) titled International Conference on Biomedical Materials Innovation (ICBMI) 2020 held during December 6 - 9, 2020. The title of his research work was "Self-Contracting and Stiffening Hydrogel promote Cartilage Regeneration". The award included a certificate, a cash prize and lifetime membership of SBAOI.
8. Sriram M (PhD/BSBE) was awarded the "Prof. S. Rajeswari award" for the best oral presentation in the 30th Annual Conference of the Society for Biomaterials, and Artificial Organs India (SBAOI) titled International Conference on Biomedical Materials Innovation (ICBMI) 2020 held during December 6 – 9, 2020. The title of his research work was "A biomimetic scaffold for Ligament tissue engineering".
9. Anubrata Das (PhD/EE) was awarded “Dr. M. Ramamoorty Best Paper Award” in Power Electronics & Drives at the 21st National Power Systems Conference (NPSC 2020) organized by the Indian Institute of Technology Gandhinagar, India during December 17 – 19, 2020. His paper was entitled "An Adaptive P-Q Management Technique for Grid Voltage Regulation Using PV Inverter".
10. Sneha Gupta (PhD/BSBE) was awarded the "Prof. S. Rajeswari award" for the best oral presentation in "International

Conference on Biomedical Materials Innovation (ICBMI) 2020" held as an e-conference at the 30th Annual Conference of the Society for Biomaterials and Artificial Organs India (SBAOI) from December 6 to 9, 2020. The title of her research work was "Periosteum mimicking tissue-engineered composite for treating periosteum damage in critical-sized bone defects".

11. Madhu Chaturvedi (PhD/BSBE) was awarded the “Sun Pharma Science Scholar Award 2020” in Biomedical Sciences. This award is given to the upcoming brilliant and young Indian researchers under thirty for their research projects. The award included a citation, a cash prize, and additional financial support for attending an international conference.
12. Team of Pankaj Kumar (BTech/EE), Sumant Kumar (BTech/EE), Dibyojyoti Sinha (BTech/EE), Siddharth Satyam (BTech/ME), Aayush Mani (BTech/EE), Jaydeep Goyel (BTech/EE), Aman Verma (BTech/EE), Ayush Saxena (BTech/EE), Bhavesh Jain (BTech/EE), Mayank Kyal (BTech/EE), Sushil (BTech/EE), Vipul Jain (BTech/EE), Harsh Singh Rajput (BTech/ME), Ragha Abhinaya M (BTech/ME), Arnab Sarkar (PhD/EE), Nachiketa Deshmukh (PhD/EE), Aditya Aman (PhD/EE) was awarded “The Ingenuity Award of IFEC 2020”, with a certificate and a cash prize.
13. Divyesh Varade (PhD/CE) received the runner-up award for the best thesis in the Doctoral category by the IEEE Geoscience and Remote Sensing Society, India. The award was announced during the IEEE GRSS India Young Researchers

Conclave 2020 organized by the Kerala Chapter, held between 18 to 20 December.

14. Manisha Chowdhary (PhD/MTH) won the Indian Mathematical Society (Group-4) best paper award for 2020 at the 86th annual IMS conference at VIT University.
15. Manoj Kumar Singh (PhD/AE) won the best paper award in the 'Composite' category at the 11th ICMPC conference held during December 15 – 17, 2020 at IIT Indore. His work is titled " Enhancing fracture toughness of laminated composite by chopped fibre reinforcement".
16. Sudhir Ranjan Das (PhD/CHE) received the "Sustainable energy and fuel" prize for the best poster at the third generation PV in the Developing World conference, organized by NECEM, Durham University UK.
17. Kamini Singh (PhD/IME) was awarded by DST under the 'Augmenting Writing Skills for Articulating Research (AWSAR) Programme' under the PhD category of Best Stories.
18. Chinmayee Nayak (PhD/MSE) received the "Best Oral Presentation Award" in the 12th International Conference (Virtual) on Advancements in Polymeric Materials (APM) 2021 organized by the Institute of Petrochemicals Engineering & Technology (CIPET) Bhubaneswar during March 9 - 13, 2021. The award carried a cash prize and an e-certificate.
19. Kamini Singh (PhD/IME) was selected for the 2021-2022 Fulbright-Nehru Doctoral Fellowship.
20. Pranjal Dutta (PhD/CSE/IITK and CMI) received the Best Student Paper Award and the Best Paper Award this year for his

paper "Real Tau-Conjecture for sum-of-squares: A unified approach to lower bound and derandomization" by the CSR 2021 Program Committee. This was the first time in the history of CSR that a single paper had been chosen to receive both awards.

21. Mendu Rama Krishna (PhD/AE) and Chirag Jain (MSR/AE) won three Best-in-Class categories prize in stage 4 of 2021 First Responder Endurance Challenge organized by the National Institute of Standards and Technology (NIST), USA. Earlier, they had won first prize in stage 3 as well.
22. Abhinav Basak (PhD/DP) received the 1st prize in TOYCATHON 2021 national championship in "Learning, Education, and Schooling".
23. Team of Shreyansh Tatiya (PhD/DP), Harikrishnan PR (MDes/DP), and Siddhant Shrivastava (PhD/DP) won the Digital Edition of Toyacathon 2021. The game they designed was named "Karma: the circle of Life ". This team participated in the category HEI Students (Track 2) under "Learning, Education, and Schooling".
24. Dr. Shashwat Bhattacharya (PhD/ME) was selected for the Humboldt Research Fellowship Programme for Postdoctoral Researchers.
25. Neeraj Kumar Das (PhD/CE) received the Best Paper Award in the 7th International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics (7ICRAGEE) held during 12 - 15 July 2021 in virtual mode. The

title of his paper title was "Experimental and numerical study of shallow foundations subjected to vertical dynamic load".

26. Dhanajit Brahma (PhD/CSE) and Dr. Vinay Kumar Verma (Alumnus/PhD/CSE) received the best student paper award at the International Workshop on Continual Semi-Supervised Learning (CSSL) for their paper titled “Hypernetworks for Continual Semi-Supervised Learning”'.
27. Abir Mukherjee (MTech/CSE) won the outstanding poster paper award at the 2020 International Conference on High-Performance Computing & Simulation (HPCS 2020) for his paper titled “A Deep Predictive Model for Tropical Cyclogenesis”.
28. Mayank Kanubhai Patel (MSR/ME) was awarded the 1st prize (Post Graduate category) in the national level “Innovation in Manufacturing Processes (IMP-2021)” project competition.
29. Gargi Singh (BT-MT/CSE) and Dhanajit Brahma (PhD/CSE) were awarded the best student paper award at the 9th International Conference on Affective Computing & Intelligent Interaction (ACII 2021) for their paper titled “Fine-Grained Emotion Prediction by Modeling Emotion Definitions”.
30. Heera Lal Maurya (PhD/EE) received the Best Paper award at IRIA 2021, IIT GOA held on September 20, 2021.
31. Shreyansh Yadav (DD/MSE) was awarded Second prize for the best poster competition at the “Powering Green Recovery” SUNRISE symposium, held from September 20 - 22, 2021.
32. Avijit Koley (PhD/PHY) was awarded the excellence in paper presentation award in FOP 2021, IIT Delhi. His research work was titled “Wavelength filter properties of optical waveguide

Bragg Grating Fabry-Perot cavity employing counter-propagating cladding modes". The award carried a cash prize and a certificate of merit.

33. Khushboo Suman (PhD/CHE) received INAE Innovative Student Projects Award 2021 for her PhD thesis. The award included a certificate and a cash prize.
34. Mr. Vijay Shankar Dwivedi (PhD/AE) was selected for the SRISTI GYTI APPRECIATION 2021 for his project work titled "A new control surface Auxiron for aircraft and a solar UAV". The award included a citation, trophy, and certificate.
35. Kalyani Barman (PhD/PHY) received a poster prize in the recently held Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2021), held as an online-remote conference, from September 27 to October 1, 2021. The title of the poster was "Effect of magnetic field on optical emission from atmospheric pressure micro-plasma jet: Experimental and simulation results".

MAJOR PROJECTS SANCTIONED

1. Technology innovation Hub in Cyber Security and Cyber Security of Cyber Physical systems (DST)
2. Creation Of Science and Technology Content for Indic Wikipedia by IIT Kanpur (DST)
3. Design and Develop Indigenous Tactical UAV with Maximum Local Content Through Collaboration Between the Parties (BEML Ltd)

4. Realizing Large-Scale and Fully Autonomous UAV Swarms (SERB)
5. Understanding The Structural and Functional Diversity in GPCR β-arrestin Interaction and Signalling (Wellcome-DBT)
6. Integrative Molecular Profiling of Prostate Cancer: Identification of Molecular Signature for Risk Stratification and Advanced-Stage Disease Management (Wellcome -DBT)
7. Imaging Coronavirus Spike(S) Mediated Membrane Fusion During Entry at Single-Molecule Resolution (Wellcome -DBT)
8. Nano Devices with Correlated Quantum Materials (DST)
9. Design and Development of a Ramjet Based Propulsion System and A Precision Guidance Kit (Pgk) for Existing 155 Mm Artillery Shell to Achieve Minimum 60 Km Range (Indian Army)
10. Design, Development, Testing and Evaluation of a Lean-Premixed Swirl Stabilized Gas Turbine Combustor for Stationary Power Generation Using High-Hydrogen-Content Fuel (DST)
11. PPP Mode Industry Projects (Prototype Development Fund) (Space Foundry Inc.)
12. Geomorphic and Ecological Impacts of Sand Mining in Large Rivers As Revealed From High Resolution Historical Remote Sensing Data And Drone Surveys: Assessment, Analysis And Mitigation Under Nmcg (Ministry of water resources)
13. Plasma Jet Printing Technology for In Mold Electronics and Sensors (Space Foundry Inc.)
14. Development of Gasotransmitter Releasing Peptidomimetics and Their Therapeutical Application in Neurodegenerative Disorders (DST)

15. Development of Printing Process for Artificial Electromagnetic Materials (DRDO)
16. Integrated Capture and Conversion of Co_2 to Methanol Using Protic Catalysts (SERB)
17. Investigations into Ternary Interdiffusion in Bond Coat Systems of Beta (Ni,Pat)Al and (Ni,Ru)Al (Gtmap) (Aeronautics R&D Board)
18. Low Speed Wind Tunnel Test on Amca, "Air Intake Model" (Aeronautical Development Agency)
19. Short and Long-Term Fog Predictions Using Data Science (MHRD)
20. Experimental Investigations of Early Transition in Viscoelastic Channel Flows (SERB)
21. Pilot Scale Testing of Smartphone Based Fluorescence Spectroscopic Device for Point-Of-Care Diagnosis of Early Cervical Cancer (DST)
22. Identification Of Processes Controlling Geogenic Uranium and Arsenic Pollution in Indian Aquifers for Long-Term in Situ Remediation (SERB)
23. Microswimmer Navigation in Complex Fluids Studying the Dynamical Aspects in Varied Media Using a Programmable Viscoelastic Environment (SERB)
24. Development Of Electrochemical Biosensors for Detection of Emerging Pollutants in Water (DST)
25. Characterization And Monitoring of Contaminant Plume Migration from Waste Dump Sites in Shallow Aquifers Using

Time-Lapse Geophysical Studies Coupled with Geochemical Analyses and Associated Hydrogeol

26. Multi-Component (High Entropy) Diborides and Carbides for Ultra High Temperature Applications (SERB)
27. Investigating The Role of Bmp Signalling, Dpysi3 and Yap Axis for Size Regulation During Embryonic Skeletal Development (SERB)
28. Wind Tunnel Testing of Ac-1 Model (DRDO)
29. High-Flux Solar Simulator (Hfss) For High-Temperature Solar Thermal Research (CPRI)
30. An Automated and Personalized Intervention for Depression Using Cognitive Behavioural Therapy and Comprehensive Bias Modification (DST)
31. Probing The Role of Dual-Membrane Cell Wall in Gram-Negative Bacterial Survival and Drug-Resistance Development Under Stressful Conditions Using Nonlinear Spectroscopy (SERB)
32. Investigating Novel Functions of Neurod in The Developing Cortex and Spinal Cord (SERB)
33. Development Of Measurement Techniques for Return Current Through Rail and Investigations on Computation of Rail Potential Rise (RDSO)
34. Photonic Metasurfaces for Applications in Diffraction and Imaging (SERB)
35. Prototype Development and Experimental Investigation of Cng Fuelled Direct Injection Spark Ignition Engine (DST)

36. Food Insecurity, Intrahousehold Dynamics and Life course Outcomes In Low And Middle-Income Countries (Medical research Council and Lancaster University)
37. Pilot of low-cost sensor technologies with Maharashtra pollution control Board and Bloomberg Philantropies (Bloomberg Philanthropies)
38. Functional similarities between the aged brain and neurodegenerative disorders: Exploring roles for genes implicated in progressive mycoclonus epilepsies in normal brain aging (SERB)
39. Mechanical characterization and structural integrity of radar absorbing paints (RAP) (DRDO)
40. Synthesis of nitrogen rich compounds for gas generator, airbag and propellant applications (SERB)
41. Interconnected microgrids for rural electrification (MEITY)
42. New PNP ligands and complexes from prebiotically relevant reactions: Bioinspired sequestration and activation of environmentally detrimental small molecules (SERB)
43. Eigenfunction localization in gradient elastic micro-nano-plates (SERB)
44. Study of shocks and wakes in granular flows (SERB)
45. Photonic meta surfaces for applications in diffraction and imaging (SERB)
46. Instrumentation for real-time measurement of various parameters on the elevated track over viaduct at Rohtak (Northern railway)

47. Design development of Sabjokothi, A preservative set up for use of vegetable/fruit vendors (DST)
48. Air quality modelling of transport and power sector emissions in India (ICCT USA)
49. Contribution of clean air project in India (Swiss agency for development and cooperation)
50. Building capacity to improve air quality in south Asia: Reducing PM 2.5 though low-cost sensor network driven policy decisions (Duke University)

LABS/ FACILITIES DEVELOPED

1. The hypersonic test facility 'S1' named 'Vaigai' is the first in the series of the Hypersonic Shock Tunnel test facilities at the Hypersonic Experimental Aerodynamics Laboratory (HEAL) (AE)
2. Geoinformatics laboratory has added two new state of the art LiDAR sensors (Faro and Reigl) and One state of the art integrated GNSS/INS system for UAV application, Macrostrain Inertial sensor and CG-6 Autograv gravity meter (CE)
3. The Geoinformatics lab has also setup a permanent GNSS base station and setup a GNSS processing facility. This base station is being linked with the international network of GNSS stations. A weather monitoring station has also been setup by the lab near the Airstrip (CE).
4. Electrospinning (E-spin Nanotech) and Freeze Dryer (Ratan Raj & Co.) has been installed (MSE)
5. Smart Grid IoT Research Lab (PI Prof. Ankush Sharma) (EE)

6. High Voltage Surge Testing and Research Lab (PI: Dr. Alok Ranjan Verma) (EE).
7. Power Electronics and EV Battery Charging Research Lab (PI: Dr. Suvendu Samanta) (EE)
8. First comprehensive psycholinguistic database for Hindi, titled, SHABD (PI: Dr. Ark Verma (Cognitive Science).
9. Development of State-of-the-art postgraduate laboratory (PI: Prof. Ashish Garg) (SSE)

TECHNOLOGIES DEVELOPED

1. A new 'motion correction technology using LiDAR sensors', has been developed by geoinformatics laboratory (CE) for which a patent has also been granted to institute
2. Two-axis modulated machining set-up has been developed (PI: Dr. S. Sekhar) (MSE)
3. A PLA additive manufacturing unit that can make designs of dimensions up to 6 inch by 6 inch by 6 inch has been developed (PI: S.K. Jha) (MSE)
4. A laser cutting machine for 0.5 inch thick acrylic, wood and Leather has been developed PI: S.K. Jha) (MSE)
5. An oxygen concentrator of capacity 10 L/min and purity level >92%een developed (PI: Dr. S.K. Jha) (MSE)
6. Joining of ZrB2-HfB2 based ultra high temperature composites and engineered Bimodal microstructure in

Al2O3-YSZ based thermal barrier Coatings- Two patents have been filed (PI: Prof. Kantesh Balani) (MSE)

7. 50GHz photodetectors for optical communications at 1550nm wavelength has been fabricated (PI: Prof. Utpal Das, EE)
8. Micro Phasor Measurement Unit integrated with NAVIC satellite clock (PI: Dr. Ankush Sharma) (EE)
9. A single-dose nanovaccine for shigellosis and process for synthesis thereof (PI: Prof. Dhirendra Katti) (BSBE)
10. Surface Modified Targeted Nanoparticles Carrying Shigella Antigens Confer Cross-protection Against Shigella Infection (PI: Prof. Dhirendra Katti) (BSBE)
11. Sulfated carboxymethyl cellulose functionalized electrospun fibers for electrostatic immobilization of cationic molecules (PI: Prof. Dhirendra Katti) (BSBE)
12. Low-cost portable EWOD-based medical diagnostic system (PI: Prof. Sameer Kandekhar) (ME)

SOFTWARE DEVELOPED

1. “Priority” an online educational software benefitting the tutors and instructors (CE)
2. Scilab Code for Turbo Coded Single User Massive MIMO with Precoding", in CodeOcean. - The software deals with the efficient extraction of information exchanged by transmitters and receivers using large antenna arrays (EE).