DIRECTOR'S REPORT

Honorable Shri N. R. Narayana Murthy, Founder, Infosys Limited, Dr. K. Radhakrishnan, Honorable Chairperson, Board of Governors of IIT Kanpur, Members of the Board of Governors, Members of the Academic Senate, all graduating students and their family members, members of faculty, alumni, staff, and student community: I heartily welcome you all to the fifty-sixth convocation of IIT Kanpur. I would also like to congratulate the graduating students and their families on this joyous occasion.

ACADEMIC ACTIVITIES

After several waves of the COVID-19 pandemic and the related challenges, the session has successfully brought back academic normalcy. It is my privilege to share some of our activities for this year.

I am happy to inform you that the total number of PhD degrees awarded at this Convocation is 251. In our efforts to encourage outstanding scholars, the Senate has approved the provision for an additional Master's degree to be awarded along with a PhD, subject to fulfilling a defined set of academic requirements. I am glad to inform you that 15 students are graduating in this Convocation's fifth batch of MTech and PhD Joint Degrees. I am also happy to convey that the first batch of 68 students of the eMasters programme will be conferred a degree today in this 56th Convocation.

In all, 2125 degrees are being awarded at this Convocation with the following details:

Graduation Data

Degree	Number of Recipients
PhD	236
MTech-PhD (Joint Degree)	15
MTech	483
MBA	21
MDes	16
MS (by Research)	51
PGPEX-VLFM	40
DIIT	1
MSc (2-yr)	150
eMasters	68
Double Major	18
Dual Degree	124
MS-PD (MS part of the Dual Degree)	14
BTech	739
BS	149
Total	**2,125**

In keeping with the flexibility that IIT Kanpur academic Programme is known for, 37 students are graduating with two Minors, whereas 191 students are graduating with one Minor. You will be delighted to know that 12 graduating students are graduating with three Minors, and 1 student is graduating with four Minors. In all, 305 Minors are being awarded. In addition, by spending one additional year at the Institute, 124 undergraduate students are graduating with a Master's degree and their Bachelor's, while 18 of our undergraduate students are graduating with a Second Major. 15 of our postgraduate students are graduating with an additional Master's and PhD de-

grees by doing other credits. Of the 1,030 students of the Bachelor's and Bachelor's-Master's dual degree programmes who are being awarded the degree today, 240 students are graduating with Distinction (CPI of 8.5 and above). To keep pace with the evolving knowledge in science, technology, and other areas, the Senate has approved 92 new undergraduate courses and 119 new postgraduate courses from June 1, 2022 to May 30, 2023.

It is a great pleasure to inform you that the graduating students have been issued their degrees conferred at the 56th Convocation today in the physical as well as digital modes. The degrees are shared through an in-house blockchain-driven technology developed at our Institute under the National Blockchain Project. The digital degrees are also being uploaded to the National Academic Depository.

Academic Initiatives

Several academic initiatives to strengthen our educational programs in the long run have been undertaken this year.

Postgraduate Academic Review Committee (PGARC)

As part of its decadal review of academic programs and associated curricula, IIT Kanpur has announced a comprehensive revamp of its post-graduate curriculum, laying down a new template with path-breaking features. The transformative steps were part of the Postgraduate Academic Review Committee Report (PGARC 2020-21) approved by the IIT Kanpur Senate in its 556th meeting in May 2023.

MTech programme in "Cognitive Systems" by the Department of Cognitive Science

While the other institutions in India offer MSc and PhD programs in Cognitive Science, there was a need for programmes that focus on basic research and technological aspects of Cognitive Science studies. The proposed MTech in Cognitive Systems attempts to bridge this gap between basic research, technological developments, and applications. The applications of interest would include domains like Education, Clinical Neuroscience, etc., where technological systems and devices based on Cognitive Science will play a significant role.

MTech programme in "Unmanned Aerial Systems" by the Department of Aerospace Engineering

The Department of Aerospace Engineering at IIT Kanpur has been leading the effort in this domain through various technology developments and demonstrations; it is prudent for the department to anchor this unique interdisciplinary MTech course in Unmanned Aerial Systems (UAS). With the availability of experts, a dedicated runway, a flight-testing laboratory, and a National Wind Tunnel Facility, IIT Kanpur is well equipped to coordinate and manage the MTech programme on UAS.

Two-year MSc programme in "Economic Sciences" by the Department of Economic Sciences

The Department of Economic Sciences launched a two-year programme in Economic Sciences. The potential for interaction with other sciences, including social sciences and engi-

neering, will impart a distinct interdisciplinary flavour to the programme, making it distinct from many currently taught Master's programs in India. This programme allows us to be at the forefront of research and teaching in Economics. The Master's programme will facilitate the incorporation of the ever-expanding domain and ever-growing technical complexity of Economics as a subject.

eMasters programme in "Sustainable Construction Practices and Project Management" by the Department of Civil Engineering

The Department of Civil Engineering started an eMasters programme in Sustainable Construction Practices and Project Management. Recently, the competitive attitude among the stakeholders and financial constraints have made any project quite challenging. In this context, a proper blend of academic and industrial thoughts is much appreciated to excel in this field. Experts from both academia and industry will teach this course. The course is intended to prepare the students to effectively learn project management and modern and sustainable construction practices in civil engineering.

eMasters programme in "Business Intelligence & Data Science" by the Department of Industrial & Management Engineering

The Department of Industrial & Management Engineering launched an eMasters programme in Business Intelligence & Data Science. It aims to give learners a comprehensive introduction to essential data science tools pertinent to business intelligence, including a conceptual approach of mining and

analytical methodologies for precise descriptive and predictive analytics. The programme is designed to address the needs of practitioners from diverse backgrounds ranging from engineering, management, finance, economics, law, and public administration.

eMasters programme in "Fintech Management" by the Department of Industrial & Management Engineering

The foundation of digital payment and transaction is the financial technology which also includes cybersecurity, blockchain, and other operational risks. The Department of Industrial & Management Engineering has launched an eMasters programme in Fintech Management to educate working professionals in one of the world's fastest-growing industries. The eMasters in Fintech Management addresses the needs of practitioners from diverse backgrounds ranging from engineering, management, finance, economics, law, and public administration either from the digital finance sector or those who wish to pursue a career in the same.

eMasters programme in "Economics and Finance for Business" by the Department of Economic Sciences

Any business programme is significantly impacted by knowledge of economics and finance. The Department of Economic Sciences launched an eMasters programme in Economics and Finance for Business to meet the growing demand of working professionals to update their knowledge in economics and finance. This programme offers a unique opportunity to learn economics and finance from business intelligence and decision-making perspectives. The programme offers a unique opportunity for business professionals to grasp a

practical understanding of different economic tools and pricing mechanisms.

eMasters programme in "Economics, Finance, and Data Analysis" by the Department of Economic Sciences

The popularity of economics, finance, and data sciences has made economics indispensable. The Department of Economic Sciences launched an eMasters programme in Economics, Finance, and Data Analysis for Businesses to meet the rising demand of working professionals to update their knowledge with the latest developments. This programme offers a unique opportunity to learn economics and finance with solid exposure to quantitative economics and data analysis skills. The programme suits industry-specific demands in the banking, financial services, and consultancy domains. It offers unique opportunities to budding economists and early career and mid-level economic professionals.

eMasters programme in "Economics, Finance, and Public Policy" by the Department of Economic Sciences

A new eMasters programme in Economics, Finance, and Public Policy was developed by the Department of Economics Sciences to meet working professionals' needs and provide them with the most recent information and developments. This programme offers a skill-based learning opportunity for policymakers and regulators working with central and state ministries/departments. This programme is unique as it provides a learning opportunity to shape-up the thought process on different aspects of public policy planning and implementation-specific modules on public policy, public finance, programme evaluation, and applied macroeconomics and finance.

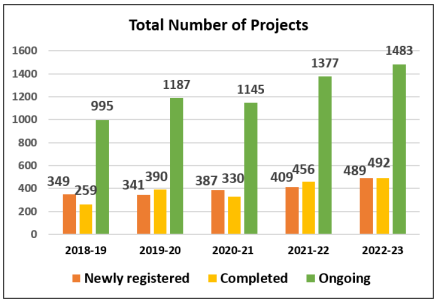
RESEARCH & DEVELOPMENT

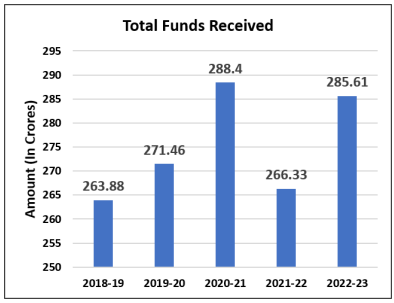
IIT Kanpur has registered steady growth in its research and development activities this year.

Research Highlights

- 1483 externally funded ongoing projects with a total sanctioned amount of Rs. 1449.39 crore.
- 298 sponsored projects were sanctioned during 2022-23 worth Rs. 139.08 crore.
- 191 consultancy projects were sanctioned during 2022-23 of Rs. 82.73 crore.
- During 2022-23, total funds received for sponsored projects are Rs. 215.18 crore and for consultancy projects are Rs. 70.43 crore.

Sponsored Research
(a five-year summary)





Leading Funding Agencies

National Security Council Secretariat	Rs. 26.07 crore
Science and Engineering Research Board	Rs. 24.20 crore
Department of Science and Technology	Rs. 14.98 crore
Ministry of Education	Rs. 8.97 crore
Indian Council of Medical Research	Rs. 6.90 crore

Five major funding agencies with sanctioned amount.

Leading Funding Industry Partners

Tata Steels, Vedanta Ltd., Mekon Ltd. Ranchi, Wavetek Microelectronics and Shell.

Major Projects Sanctioned

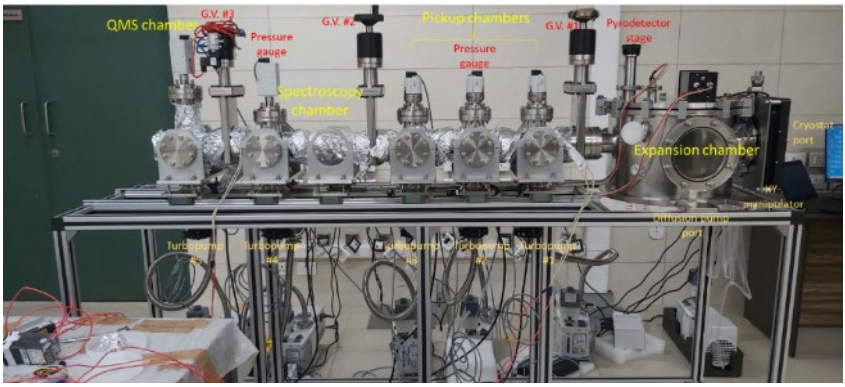
Some of the major projects sanctioned for the year 2022-2023 are mentioned below.

Exploring Chemistry at the Molecular Level Using High-Resolution IR Spectroscopy in Superfluid Helium Nanodroplets – funded by Science and Engineering Research Board

A helium droplet spectrometer is being set up at IIT Kanpur. The set-up will be the first such spectrometer in India. It is one of the ~15 in the whole world. Helium droplets are clusters of helium atoms, which have an equilibrium temperature of 0.37 K. These droplets are superfluid. Molecular beams of these droplets can be produced by expanding ultrapure helium gas (99.9999% purity) into the vacuum (~1 × 10^{-6} mbar) from a precooled nozzle (temperature 8-22 K, backing pressure 20-80 bar) of 5-micron diameter. The produced droplets then pass through multiple vacuum chambers, which have a background pressure of < 5×10^{-9} mbar and are finally detected by a quadrupole mass spectrometer attached to the last vacuum chamber.

Isolation of single molecules as well as the formation of large molecular aggregates can easily be achieved inside droplets. Molecular-level pathways of chemical reactions, occurring at sub-kelvin temperatures relevant to interstellar chemistry, can be traced. The project aims to study these molecular processes using high-resolution infrared spectroscopy. For this, the helium droplet setup will soon be coupled with a high-resolution (linewidth ~ 0.0001 cm^{-1}), broadband (2500-4500

cm^{-1}) mid-infrared laser source to study, e.g., O-H, N-H, C-H, O-D, C-D, and S-H, vibrations of the molecules and molecular aggregates.



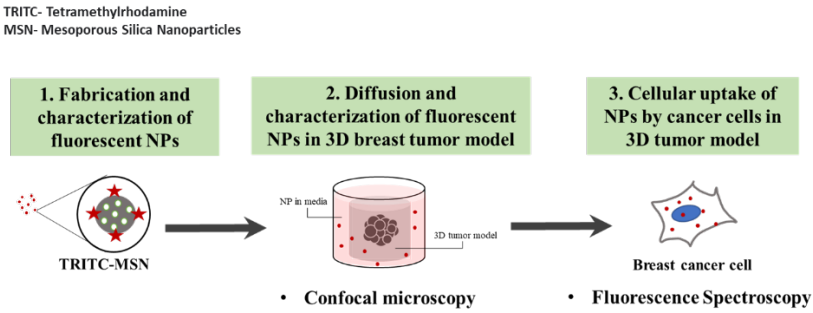
Laboratory Testing for Ongoing Study on Hydrogen Blending in Natural Gas Pipeline- funded by GAIL (India) Ltd.

As part of the National Hydrogen Mission, GAIL (India) Ltd. has entrusted IIT Kanpur to determine the appropriate blend of hydrogen into natural gas that can be passed through the existing pipeline network avoiding considerable damage due to hydrogen embrittlement.

The project entails systematic testing of steel pipelines in hydrogen environment maintained at high pressure around 100 bar. This requires design and development of permeation chambers and in-situ testing facilities that will facilitate mechanical testing of steel specimens in hydrogen blended natural gas at IIT Kanpur.

Understanding and Overcoming the Acellular Barrier of Breast Tumors for Improving Nanoparticle Mediated Chemotherapy – funded by Department of Biotechnology

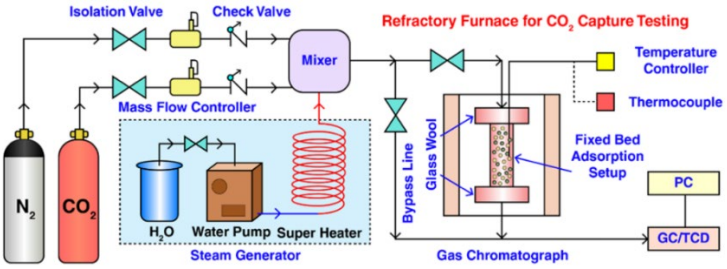
Advanced stage breast cancers are stiffer than lower stage tumors. The stiffness is associated with fibrosis which acts as a barrier for nanoparticle (NP) penetration, thus contributing to poor clinical translation of NP-based therapies.



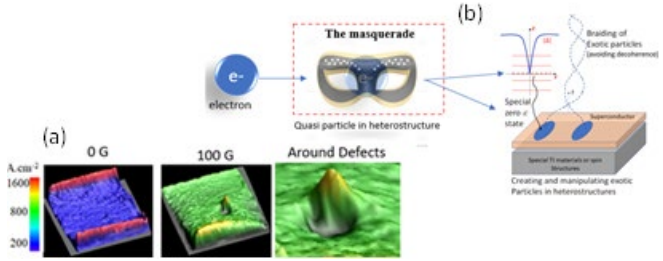
This project proposes to study the diffusion of NPs in a 3D breast tumor model of varying stiffness associated with cancer progression. Furthermore, it proposes a sequential delivery of collagenase followed by niclosamide (a potential anti-fibrotic agent), using pH responsive NPs. Collagenase is expected to degrade stiff hydrogel (which mimics tumor stroma) and niclosamide is expected to inhibit the deposition of new extra cellular matrix, thus facilitating an improved NP penetration and accumulation into the tumoroid. The improved bioavailability of NP in the tumor is expected to significantly enhance the therapeutic efficacy of traditional chemotherapy. Moreover, the proposed strategy can be used as a platform technology for other solid tumors as well as fibrotic diseases.

Utilization of Coal Gangue to Develop Porous Adsorbents for CO_2 Capture – funded by Ministry of Coal

Carbon capture, utilization, and sequestration (CCUS) is a promising technique to mitigate global warming as we continue to gradually switch towards cleaner fuels. In this technique, carbon dioxide, emitted from various sources including power plants and industries, is captured, utilized as feedstock for various chemicals, and injected into the subsurface including in deep sea aquifers and depleted oil and gas fields. Currently, amine-based processes are commonly used for carbon dioxide capture. However, this technique has various disadvantages including being energy intensive and requiring expensive solvents. The objective of this study is to develop low-cost porous adsorbents for carbon dioxide capture utilizing waste material generated during coal mining process.



Building a unique Magneto-optical setup with capability for simultaneous imaging of electric current, magnetization & bulk transport measurement at low temperature with vector magnet for imaging strong correlation driven Topological Insulator & its heterostructures – funded by Science and Engineering Research Board



A unique setup for imaging electric current distribution for application in the domain of advanced quantum materials and devices is developed at the Magneto-Optical imaging lab of IIT Kanpur. Redesigning of the system is ongoing, with a view to achieve enhanced sensitivity between room to cryogenic temperatures, and in low to very high magnetic field environments.

Using this, the project aims to explore strong correlation driven physics in new Quantum materials like Topological Insulator (TI) and their heterostructures, hosting unexpected new quantum phases and phenomena. Such systems potentially host robust new topologically protected quantum states which help avoid decoherence issues of quantum information bits. The development of the imaging technique to image electric currents down have already been demonstrated to a few milli-Amperes.

Ambient air quality Monitoring over Rural areas using Indigenous Technology (AMRIT) – funded by Open Philanthropy

Air pollution is an environmental threat that causes the mortality of more than a million people in India every year, as per the Disease Burden India report. Previously, Air Quality (AQ) research highlighted more insights about urban AQ in India, but more knowledge is needed about rural AQ.

This project aims to support rural AQ monitoring. The objectives of this project are to create micro airsheds within the different states to effectively manage the AQ at the district level by understanding the contributions from various sources. Furthermore, the rural AQ data from the project will be utilized for science and policy development for better rural AQ management plans to avoid adverse impacts on citizens' health. Initially, the project aims to monitor the rural AQ over Bihar and Uttar Pradesh in collaboration with respective State Pollution Control Boards. The project will create the research facility using indigenous technology with the support of two start-ups: Respirer and Airveda.

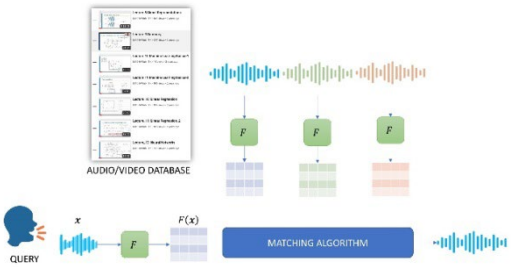
Indo-Italian Centre of Excellence for Restoration and Assessment of Environmental Impacts on Cultural Heritage Monuments – funded by Department of Science & Technology and Italian Ministry of Culture

The national monuments must be restored and maintained so that they last for many generations. The adverse impact on the monuments can be both from natural and anthropogenic occurrences. This requires repairs, reinforcement and restoration

work to continue adopting modern technologies. It also requires that one understands the cause-effect relationship for the health of the monuments and heritage buildings. The potential damage to the historical monuments from air pollution can cause structural and aesthetic harm to the monuments.

The objective of this project is to undertake joint research activities by the Indian and Italian sides from academia, exchange of knowledge, and experience, train research scholars who will provide support for the relevant activities, identify the monuments requiring restoration and conservation work, and demonstrate restoration. The proposed network of excellence is expected to achieve a long-term collaboration between India and Italy including the exchange of knowledge, experience, research and technology development, publications, and training of research scholars and post-doctoral fellows. The other outcomes include demonstrating monument conservation and restoration in India and Italy and study of the environmental impacts on monuments.

Speech Technologies In Indian Languages - funded by Ministry of Electronics and Information Technology



Search is a problem ubiquitous in diverse domains and modalities. Speech search engine plays a vital role in numerous speech communication applications, including audio/video search and

retrieval, audio broadcast monitoring, and voice-based surveillance. The performance of the speech search system depends critically on the representation of the speech signal. A good feature representation should be speech-specific, and at the same time, it should be robust to the speaker and channel variability. In this project, we are developing two kinds of speech search systems – (i) language-dependent (works for a specific language), and (ii) language-agnostic (works for any language). The system will be used for NPTEL audio/video search for Indian languages.

GIS (Geographic Information System)/GPS (Global Positioning System) Mapping of Waqf Properties in The State of Uttar Pradesh - funding by Uttar Pradesh Sunni Central Waqf Committee, Lucknow

The main objective of the project is to digitally map all the properties that fall under Sunni Waqf Board of UP including Mosque, shops, houses, agricultural land etc. GIS/GPS mapping of such properties are done in field to gather all information on a Digital Platform. The project intends to track the growth of properties over the past 40-50 years, identify encroached properties and provide valuable insights into the changing landscape and potential trends for the Sunni Waqf

Board. By having a comprehensive and accurate record of properties, the Sunni Waqf Board can identify any underutilized or unutilized assets that could be developed or monetized to generate additional income. This increased revenue can benefit both the board and the government. Similar successful initiatives have been undertaken in Punjab, Gujarat, Andhra Pradesh, and Himachal Pradesh.

COLLABORATIONS THROUGH MOUS

IIT Kanpur and **Centre of Bio Medical Research (CBMR)**, Lucknow signed an MoU to undertake translational research with special reference to patient care. The areas identified for collaboration are AI in healthcare, biomedical devices, identification & synthesis of small molecules for drug discovery.

An MoU has been signed between IIT Kanpur and **Central Manufacturing Technology Institute (CMTI)**, Bangalore to collaborate as strategic partners for undertaking R&D activities in Laser Technology, Photonics Sciences & Engineering, Advanced Manufacturing, Machine tools and related thrust areas of technology.

An MoU was signed with **New Energy and Industrial Technology Development Organization (NEDO)** to support the implementation of the study for the LCA Analyses of Hybrid Electric Vehicles vis-a-vis Internal Combustion Engine Vehicles and Electric Vehicles in India.

National Highways Infrastructure Development Corporation Limited (NHIDCL) and IIT Kanpur signed an MoU to establish the basis of collaboration to take up various activities of common interest such as sharing knowledge on innovative ideas and technologies in the field of highway engineering and others as per mutually agreed terms and conditions.

Defense Research and Development Organization (DRDO) exchanged MoU for setting up DRDO Industry Academia Centre of Excellence with IIT Kanpur in the presence of Hon'ble Raksha Mantri Shri Rajnath Singh at DEFEXPO22 in Gandhinagar. The centre at IIT Kanpur will focus on advanced materials and flexible electronics.

IIT Kanpur and the **University at Buffalo (UB)**, the State University of New York have signed an MoU to establish the IIT Kanpur-UB Joint Centre of Excellence in Biomedicine and Bioengineering at IIT Kanpur. It is a step forward in continuation of the MoU we signed last year with UB.

IIT Kanpur and **University of California at Santa Cruz (UCSC)** have signed an MoU for collaborations including exchange of faculty & students, joint research activities, exchange of academic publications and short-term programs/visits.

Building upon the previous MoU, IIT Kanpur and **Rice University, USA** signed cooperation agreement that sets out guidelines for the two universities to develop joint research and academic engagements in the broad areas of Engineering, Sciences, Medicine/Healthcare, Humanities, and Management/Business.

IIT Kanpur has signed an MoU with **RITES Ltd.**, the leading Transport Infrastructure Consultancy and Engineering under Ministry of Railways. It aims to strengthen and develop a sus-

tainable future by working together towards decarbonization in various sectors and NetZero, complemented by climate change studies.

IIT Kanpur will collaborate with **Niche Agriculture & Pharmaceuticals Limited** for research in the field of formulation of advanced medicines for treating chronic medical conditions. An MoU was signed in the presence of Mr. Harisharan Devgan, Chairman, Niche Group of Companies.

Mr. Ajay Dubey (BT/CHE/1980) and his wife, Mrs. Rooma Dubey, have generously donated Rs 2 crore towards the establishment of **"Rooma & Ajay Dubey Healthcare Innovation and Ideation Program"** (HII) at IIT Kanpur. The program will support student start-ups in developing innovative solutions and technologies in medical care, for which an MoU was signed at IIT Kanpur.

IIT Kanpur and **Bharat Heavy Electricals Limited (BHEL)** have signed an MoU to jointly work on the emerging opportunities in the Indian Defense and Aerospace sectors.

R&D Events

Participation of IIT Kanpur in UP Global Investor's Summit 2023

IIT Kanpur participated in the UP Global Investors Summit 2023 in Lucknow. The three-day long Summit aimed to bring together policymakers, corporate leaders, business delegations, academia, think tanks, and government leaders from across the globe to explore business opportunities and forge partnerships collectively. Cutting-edge innovations and technologies developed under different departments and centres at IIT Kanpur, C3i Hub, Startup Incubation and Innovation Centre, IIT Kanpur, Centres for Excellence in AI, Centre of Drones, and Defence Industrial Corridor and startups incubated at IIT Kanpur participated in the event exhibiting their products across various domains. Hon'ble Chief Minister of Uttar Pradesh Shri Yogi Adityanath ji and Hon'ble Union Cabinet Minister Shri Nitin Gadkari ji visited IIT Kanpur stall in UP Global Investors Summit 2023.

IIT Kanpur's participation at inter IIT Research fair IInven Tiv 2022

An inter IIT research fair "IInven Tiv" was organized at IIT Delhi on October 14 and 15, 2022 to bring together key stakeholders from the industry, government institutions and academia to collaborate, exchange ideas, learn and innovate. The event was inaugurated by the Hon'ble Union Minister of Education and Minister of Skill Development & Entrepreneurship,

Shri Dharmendra Pradhan ji. Around twenty-three IITs participated in this event and displayed seventy-five technologies. Along with students, IIT alumni from around the world, faculty from different CFTIs, and scientists from DRDO, ISRO, CSIR, and ICAR and representatives from the Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce & Industry (FICCI), and National Association of Software and Service Companies (NASSCOM) participated. IIT Kanpur displayed twelve technologies, and among these, two technologies, namely Drone and 5G test bed, were chosen as showcase technologies. IIT Kanpur had the highest number of projects at this event.

Research Infrastructure

DRDO Industry Academia Centre of Excellence (DIA-CoE), IIT Kanpur

DRDO has signed an MoU with IIT Kanpur for setting up the DRDO Industry Academia Centre of Excellence IIT Kanpur (DIA-CoE, IIT Kanpur), for collaborative directed research under identified research areas. DRDO and IIT Kanpur have jointly decided the following research verticals:

- Printing on Flexible Substrates
- Advanced Nanomaterials
- Accelerated Material design and development
- High Energy Materials
- Bio- Engineering

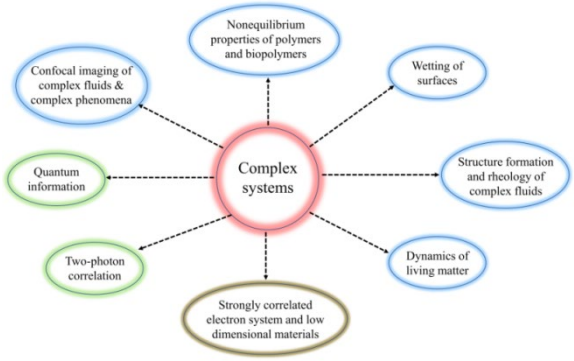
Integrated Clean Energy Material Acceleration Platforms (ICMAP)

In a new collaborative initiative in energy innovation launched by the Department of Science & Technology, Govt. of India, IIT Kanpur has been adjudged as a lead institute to lead one of the three Integrated Clean Energy Material Acceleration Platforms (ICMAP). The Integrated Clean Energy Material Acceleration Platforms were launched at the Mission Innovation (MI) Annual Gathering session on 4th April 2022, by Hon'ble Minis-

ter of Science and Technology Dr. Jitendra Singh ji. He awarded the citations to the three respective centre leads of the Clean Energy Material Acceleration Platforms.

These Material Acceleration Platforms are set up with the aim of leveraging emerging capabilities in next-generation computing, artificial intelligence (AI) and machine learning (ML), and robotics to accelerate the pace of materials discovery up to 10 times faster.

Advanced Experimental Facility for Probing Complex Materials and Phenomena



Through this research funding, Department of Physics wishes to improve our abilities to study various complex materials and phenomena in a range of systems including complex fluids, living matter, and quantum materials. To this end, we are in a process to develop a central facility with state-of-the-art confocal microscope, rheometer, q-CMOS cameras, and refurbishing the existing PPMS. Specifically, we would like to image and perform mechanical measurements (rheology) of soft and

living matter, also in *operando conditions*. Furthermore, coupling the rheometer with the confocal imaging would open enormous possibilities within the domain of our research interests. The q-CMOS cameras will be used to study coherence and entanglement of high-dimensional quantum states. PPMS will be helpful in investigating emergent quantum phases in strongly correlated electrons systems and low dimensional materials. We believe that the current FIST proposal will allow us to develop these facilities and thereby strengthen our capabilities as a department in addressing the pressing problems in various areas as depicted in the figure.

New Initiatives

Study Centre for Indian Knowledge System for Holistic Advancement

IIT Kanpur launched ŚIKṢĀ (Study Centre for Indian Knowledge System for Holistic Advancement) on the auspicious occasion of Akshaya Tritiya. The centre's mission is to promote, facilitate, and benefit from Indian Knowledge System related studies, research, content development, and outreach. The centre will carry out research in the domains of Health & Wellness, Mathematics & Astronomy, Sanskrit & Linguistic studies, Consciousness studies, Archaeo-metallurgy & Materials, Darsanas, Acoustics & Music, and Water management systems.

INNOVATION AND INCUBATION

During the Financial Year 2022 – 23, 114 IPR's were filed by the Institute including 88 Indian Patent applications, 3 US Patents, 20 Design registrations, 1 Trademark application and 2 Copyrights, 121 previously filed IPRs were granted, and 6 technologies were licensed to Industry Partners.

Till date, 944 IPRs have been filed, out of which 465 have been granted so far along with 129 technologies licensed for commercialization.

Technologies Licensed (2022-23)

A gene therapy technology for hereditary eye diseases

In a historic moment, a pioneering technology has been licensed to Reliance Life Sciences Pvt. Ltd. that has the potential to revolutionize the field of gene therapy, especially for many genetic eye diseases. There are many inherited disorders caused by a faulty gene. 'Gene Therapy' replaces the faulty gene with a functional version of the gene to treat such disorders.

This marks a momentous occasion where a gene therapy related technology developed in an academic institution has been transferred to a company in India. The gene therapy technology from IIT Kanpur, which has been protected with an *Indian Patent Application No. 201811035192,* will be further

developed as an Indigenous Product by Reliance Life Sciences.

Developed by Professor Jayandharan Giridhara Rao and Mr. Shubham Maurya from the Department of Biological Sciences and Bioengineering (BSBE), IIT Kanpur, the patented technology modifies the gene of an organism to treat a hereditary disorder. In this case, the site refers to a specific location on an Adeno-associated virus (AAV) (viral vector) used for gene therapy. The technology modifies this location to optimize its ability to deliver genes to the affected cells and improve its effectiveness. The technology has the ability to improve gene therapy for many hereditary diseases, especially inherited eye diseases. It has shown significant promise in correcting the vision impairment in animal models of blindness. The technology holds great promise for treating a wide range of hereditary eye diseases including Leber congenital amaurosis, an eye disorder that is present from birth; and Retinitis pigmentosa, a disease causing progressive sustained vision loss.

A Tactile smart watch for visually impaired

An invention developed for the visually impaired has been licensed to Ambrane India Pvt. Ltd. for mass manufacturing and sales. It is a novel touch sensitive haptic smart watch for the visually impaired and blind persons, developed by Professor Siddhartha Panda and Mr. Vishwaraj Srivastava from the National

Centre for Flexible Electronics at IIT Kanpur. The invention has been granted an Indian Patent No. 406040.

The haptic watch addresses the drawbacks of the conventional technologies. It has 12 touch sensitive hour markers arranged over the dial face. User needs to scan the markers with his/her fingers. Suppose the time is 3:40, 3rd and 8th marker will be termed as the active markers. There will not be any response on inactive markers but on touching the active markers, vibration pulse gets generated. A long pulse on 3 will indicate hours and a short pulse on 8 will indicate minutes.

This watch is a fusion of tactile and vibration watches. The complexity of vibration watch generating more than 20 pulses has been reduced to 2 pulses, and the fragile nature of a tactile watch is eliminated. Thus, the watch is easy to use and scores on privacy, affordability and robustness.

Tactile watch for visually impaired

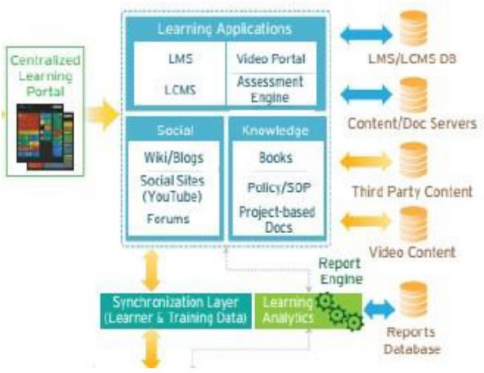
This variant of the technology, i.e., the smartwatch, is equipped with smart features to indicate health parameters such as heart rate, step count, hydration reminder and smart timer to set short timer by using simple gestures. The existing smartwatches for the blind and visually impaired use audio-based output which is not private, and users generally may not feel confident using it everywhere. And the braille smartwatch is expensive. The developed smartwatch which offers a tactile-haptic interface for display of time and health parameters, addresses these draw-

backs. The use of innovative haptic icons makes it easy to navigate the menu and a simple gesture like the double-tap can open a particular health monitoring app. These numbers are communicated in a similar way as the time.

Online/ Offline hybrid delivery platform

The technology is a learning platform, which has been licensed to IIT Kanpur Foundation and Advanced Continuing Education & Training (IFACET) with an objective of improving the quality of faculty of institutes, colleges in the respective States/UTs through faculty training programs for:

- Engineering, Polytechnics etc. in emerging areas of Electronics & IT.
- Arts, Commerce & Science colleges etc. on utilization of IT tools and techniques for application in their respective domain of knowledge/learning/teaching/enhancing productivity.
- To develop state-of-the-art facilities like technical labs, well equipped library, interactive virtual learning facility etc.



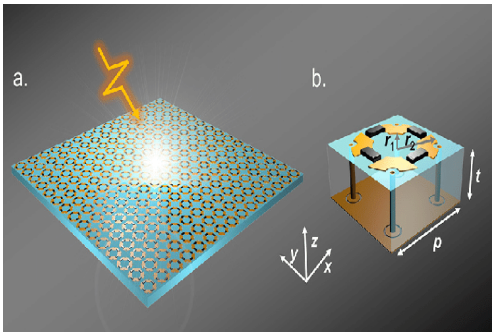
It is an online dynamic platform for designing and delivering E&ICT courses to a large audience in a very short period, through social, mobile, analytics, and cloud technologies. The online delivery model has been designed, developed and deployed by IIT

Kanpur. This platform has an ability to handle 30,000+ quizzes to be attempted daily (~ 10,000 teachers), with minimal incremental cost for both delivery of the courses and launch of new facilities.

Textile based metamaterial absorber with broadband absorption

The technology has been licensed to an industry partner for an increasing usage of electromagnetic metamaterial for communication applications, including new forms of metamaterial-enabled personal communication satellites and radar. The technology has been invented keeping in mind the increasing demand for communication antennas for applications such as satellite communication, Wi-fi Router, radar communication and 5G communications. Optical filtering, medical devices, remote aeronautical operations, sensor detectors, solar power management, crowd control, radomes, antenna lenses, and even earthquake protection are all possible applications of Metamaterials.

Metamaterial Absorber



A technical know-how - metamaterial absorber has been licensed which is a type of material intended to efficiently absorb electromagnetic radiation such as light. Metamaterials are an advance in materials science. Hence, those metamaterials that are designed to be absorbers offer benefits over conventional

absorbers such as further miniaturization, wider adaptability, and increased effectiveness. Intended applications for the metamaterial absorber include emitters, photodetectors, sensors, spatial light modulators, wireless communication, and use in solar photovoltaics and thermophotovoltaics.

STARTUP INCUBATION AND INNOVATION CENTRE IIT KANPUR

Noteworthy Events and Programs in the Year 2022-23

- Around 16 incubated startups joined SIIC in a delegation to Singapore to meet more than 8 international industrialists and Venture Capitalists. The visit has initiated a dialogue to strengthen bilateral ties with Singapore's business community.
- DWIH-German Centre for Research and Innovation organized 'Innovators Connect Tandem Program' in collaboration with SIIC & C-CAMP to enable international alliance among German and Indian early-stage entrepreneurs. 16 early-stage startups participated in all, 3 were from SIIC & C-CAMP.
- The 1st ASEAN-India Startup Festival which was part of the overall ASEAN-India Science, Technology and Innovation Cooperation program between the ASEAN COSTI and DST, GoI. SIIC coordinated AISF'22 along with BRIN, Indonesia, which received impressions from more than 10,000 people, including researchers,

startups, inventors, and over 60 startups from ASEAN Member States and India.

- The MoU exchange between Korea Startup Forum and SIIC will extend co-incubation and technology exchange opportunities to Korean-based Startups and benefit Indian Startups, simultaneously. The MoU was signed during the COME-UP Startup Festival, one of the largest startup events in Asia.

SIIC has executed 3 Accelerator Programs with support from our Government and Corporate stakeholders, enabling the pool of 21 phenomenal startups to optimize their entrepreneurial ventures.

1. **NIRMAN Accelerator Program**
   SIIC has launched a first-of-its-kind product accelerator program for innovators developing sustainable solutions in the Healthcare and Agriculture domains, supported by the Department of Science and Technology (DST), Government of India, through its NIDHI scheme portfolio.
2. **Social Innovation Lab by CITI Accelerator program & Demo Day**
   The lab AIIMS at discovering incredible early stage & growth stage, high - impact, for - profit start-ups working in social impact spaces.
3. **IAN-IIT Kanpur Accelerator Program**
   On account of the National Startup Day, Startup Incubation and Innovation Centre, IIT Kanpur, is launching the IAN-IIT Kanpur Future Tech Accelerator Program.

Abhivyakti 2023

The two-day Annual Festival, 'Abhivyakti', organised by SIIC, IIT Kanpur, was held on 4th and 5th March 2023. SIIC is a leading startup incubator, providing early-stage startups with the necessary support and resources to succeed. This festival provided an exceptional platform for showcasing ideas and innovations, and networking opportunities with industry experts and investors for the necessary support and resources to succeed.

Milestones of the Year 2022-23

- Kaushambi gets World's First Solar Powered Floating Grid: i-Ghat, supported by NTT Data Services, managed by SIIC IIT Kanpur, executed by AIPL Pvt. Ltd., a startup Incubated at SIIC IIT Kanpur.
- SIIC IIT Kanpur participated in Aero India DEFEXPO22 in Gandinagar, Gujaraj.
  SIIC IIT Kanpur reached 150+ Incubatees this year.

Success at SIIC IIT Kanpur

- Phool.Co an IIT Kanpur backed innovation shines at global stage as Prince William unveils the finalists for the 2nd Annual Earthshot Prize.
- COSGrid Networks is one of the 6 winners of the MVP stage organized by the Data Security Council of India.
- Proplant food was selected among the top 75 innovations across India and displayed during Independence Day at Vigyan Bhawan in Delhi.
- NapID Cybersec won the Reserve Bank of India (RBI) Hackathon.

- NapID Cybersec represented India at VIVATECH2022 in Paris as one of the top 15 innovations of the country, where India was awarded ‘Country of The Year’. Selected as the top 10 startup solution in Global Fintech Fest 2022, Mumbai.
- CD SPACE Robotics the only indigenous drone manufacturer at the Drone Festival of India.
- Secure Blink Tech featured in Inc42 Media's '30 Startups to Watch'.
- Saptkrishi won the Schfellar India Social Innovation Fellowship. The 2nd finalist for the Ericsson Innovation Awards 2022 for ‘Impact Sustainable Future’.
- AiRTH was awarded the Best Innovation of the Year at the World Environment Expo 2022. The only technology that has been proven to deactivate the LIVE SARS-CoV-2 virus.
- Greengine Pvt. Ltd signed a partnership agreement with IOCL for a Net Zero future. Selected in India Water Pitch Startup Challenge-AMRUT for a grant of 20L INR from MoHUA.
- Technisanct signed a partnership agreement with IOCL for a Net Zero future. Selected in India Water Pitch Startup Challenge-AMRUT for a grant of 20L INR from MoHUA.
- Brookshire Pvt. Ltd presented their Entrepreneurial journey at GEB, Bangkok.
- Worker Union support WUS’ analysis for Data Push to Atmanibhar Bharat was selected for the TIDE Scaleup funding program (GTM).

- Surobhi Agro is one of the top social startups in the Tata Social Enterprise Challenge.
- Life & Limb selected for the MeitY TIDE 2.0 Scale-up funding at Digital India Week.
- Werehab was selected for the NASSCOM DeepTech Club program. Selected among the top 75 innovations that got displayed on Independence Day at Vigyan Bhawan, Delhi. Availed credits as one of the top 250 startups at the Amazon Sambhav Entrepreneurship Challenge. Won the TiE Nagpur's Women Pitching Competition.
- Novoearth bagged a position in the Pitch Battle Competition at the 1st ASEAN-India Start-up Festival 2022. Among the five winners of the Techtonic: Innovations in Sustainable Construction program.

The following table lists the companies incubated in SIIC by our alumni.

Name of alumni	Entrepreneur in the field
Mr. Sarvagya Shukla (Skyai Technologies Private Limited)	SkyAI is developing anti drone solutions to counter the threats posed by UAV's and drones. SkyAI is developing AI based object detection models for detecting the airborne drones using high resolution visual and IR cameras. SkyAI solution is an end-to-end solution that will detect, localize and eventually neutralize the

	target drones.
Mr. Irfan Qayoom, Dr. Ashok Kumar (Regenmedica Pvt. Ltd.)	Regenmedica, is a team of experts in the domain of bone tissue engineering, aims at developing polymeric and ceramic materials as regenerative therapies for tissue damage focussing primarily on the development of nanohydroxyapatite based bioactive ceramic as an antibiotic carrier for the treatment of bone tuberculosis. The innovation will benefit industrial, clinical and societal levels by providing an affordable, easy to operate indigenous product.
Mr. Suyash Sinha (Garudaire Private Limited`)	Garudaire deals in the business of UAV Security. Varun is a smart surveillance and interceptor drone capable of multi-modal sensing and deep learning event analysis of cyber and physical events to provide a deep situational awareness. It is also capable of taking a few key actions to thwart such attacks.

C3i HUB

C3iHub (Cybersecurity and Cybersecurity for Cyber-Physical Systems Innovation Hub) is a Technology Innovation Hub established at IIT Kanpur in 2020, funded by the Department of Science and Technology, Government of India, under the National Mission of Interdisciplinary Cyber-Physical Systems. As the name implies, C3iHub addresses cybersecurity issues of cyber-physical systems in its entirety. From analysing security vulnerabilities and developing tools to address them at various levels of critical cyber-physical system architectures, to nucleating start-ups developing such tools at scale, to partnering with industries for co-development and technology transfer, to training the next generation of cybersecurity researchers, C3iHub works on every level that facilitates country's adoption and advancement of cyber-physical systems. Current employee strength of C3iHub as a Section 8 company is more than 100 and expected to reach 200 by the end of 2023.

Past year was a significant year for C3iHub as several technologies/technology products got deployed, several have become ready to be deployed.

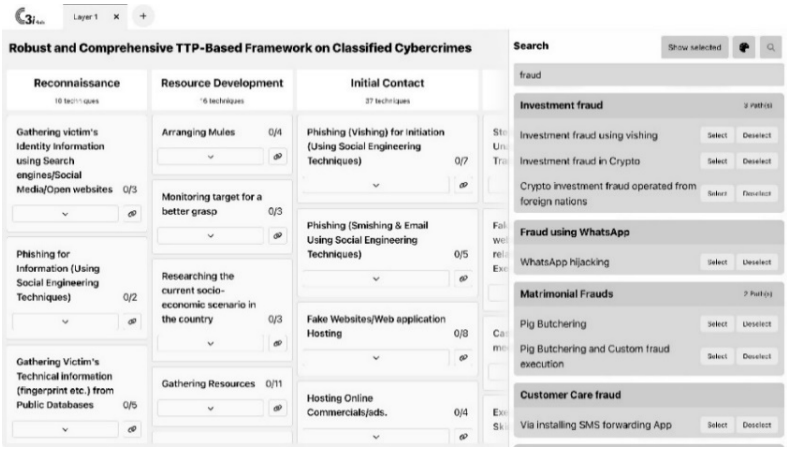
C3iHub has successfully installed a SoC (Security Operations Centre) with IPA (Indian Ports Association). This is the second SoC deployment by C3iHub protecting the country's critical infrastructures. In 2021, C3iHub had deployed SoC at NHAI headquarters. The SoC at IPA protects computers that monitor port operations under IPA. C3iHub security experts are present on-site 24/7 to monitor cybersecurity threats, analyze security log data from SIEM (Security Information and Event

Management) platform, report about threats, and provide fixations. In addition, C3iHub CERT-IN empaneled Security Audit team has completed security audits for all major ports under IPA and Mangalore Refinery and Petrochemicals Limited (MRPL). Another SoC installation is under progress in BIT Mesra as a part of providing end-to-end security services; honeypots, asset management solutions, intrusion detection systems are being deployed by C3iHub-incubated start-ups.

C3iHub SoC Installed at IPA (2022)

Over the past year, C3iHub has developed a unique solution to help cybercrime investigation officers and law enforcement officers with cybercrime incident responses. Although cybercrimes (i.e., attacks targeting humans, like customer care frauds, online matrimonial frauds, etc.) have surged dramatically in recent years, currently there is no framework for cybercrime incident response to understand what happened, how it happened, how to attribute the crime, and how to collect the chain of evidence to bring the criminals to justice. C3iHub has developed a TTPs (tactics, techniques and procedures)-based framework (and interactive tool to navigate the framework), whereupon a systematic process can be established for various types of cybercrimes, and evidence collection and mapping of pieces of evidence can be made to understand the at-

tacker's behavior in a crime lifecycle. The solution (TRL 8) will soon be deployed with Telangana Police.



Searching pre-defined crime path – Screenshot of the Tool

C3iHub has developed another unique solution, blockchain-based Transferable Development Rights (TDR) system that allows secure, transparent, and tamper-proof storage and management of Development Rights Certificates. The technology will enable transparent trading of land holdings in cities that have been acquired by city administration, and reduce litigations, possibility of frauds etc. The technology (TRL 9) is ready to be deployed with Kanpur Development Authority. With incubated start-up Trential (formerly known as CRUBN), C3iHub has deployed blockchain-based immutable, globally verifiable, instantly shareable Self-Sovereign Identity (SSI) digital identities - with AKTU (over 55,000 degrees) and NSDC (50 lakh digital certificates/year).

C3iHub is also developing Cyber Security Capability Maturity Models (CCMM) and assessment and analytics frameworks

for critical sectors of the country (power and energy, government, health, telecom, transport etc.) with NCIIPC (National Critical Information Infrastructure Protection Centre), which will help organizations associated with these sectors to improve their security posture.

C3iHub has supported 41 start-ups so far (16 new last year), and nearly half of the start-ups' products have already reached TRL 7 or higher. C3iHub has also supported 33 R&D (8 new last year) projects to date. Through ongoing cybersecurity skill development programs, C3iHub has trained about 600 individuals this past year.

IIT KANPUR RESEARCH AND TECHNOLOGY PARK FOUNDATION (TECHNOPARK@IITK)

IIT Kanpur Research and Technology Park Foundation (brand name, Technopark@iitk) is a Section 8 not-for-profit company set up in 2019, with the ambitious endeavor to invite industry and R&D organizations to co-locate their R&D centres within its premises and create indigenous futuristic technologies in close collaboration with IIT Kanpur research fraternity.

The company started its operations in March 2019 and since then has had close to 150+ industry interactions. With seven new companies coming on board last year for R&D collaborations, the research park is gradually evolving and making steady progress.

Highlights (2022-23)

- TISA Aerospace, Cingularity Tech, HRMac Technologies and Medetronix set up their R&D centres.
- Technithon International and JK Cement renew their partnerships and expand their R&D activities with IIT Kanpur.
- The Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) and Technopark@iitk sign an MoU for jointly exploring collaborations with companies in the UP-Defence Corridor and handling their R&D needs.
- In collaboration with IIM Lucknow Entrepreneurship Incubator, a 9-month accelerator program, in the fields of IoT, AI and ML, launched, and eight startups selected in the first cohort.
- The quarterly talk series titled 'FORTECH' was launched. The talks featuring eminent speakers from Industry, Academia and Government serve as a forum for knowledge exchange that will bring the major stakeholders together for a more rigorous and close-knit R&D collaboration.
- Outreach activities held in partnerships with UPEIDA, PHDCCI, CII, UPGIS, UP Trillion Dollar Economy ET Conclave.

R&D Impact of Member Companies

Number of Industry R&D Set ups

- 11 (8 residential; 3 affiliates)

Number of Collaborative Research Projects

- 2 completed; 4 ongoing; 10 in pipeline

Number of Student Engagements

- 5 part-time; 2 full-time offers

Joint Publications

- 5

Number of MoUs facilitated by Technopark@iitk

- 2 (POCT Group of Companies and TVM Signalling and Transportation Systems)

Product Development

- LAMAS, a comprehensive suite of tools and services leverages advanced technologies of IoT, AI, and ML to provide real-time insights and recommendations for sustainable agriculture and rural development (lake monitoring).
- Highly advanced hand-held electrochemical analyser by June 2023.
- Saliva-based non-invasive Portable Device for Oral Cancer Screening by 2024.

The new face of industry-academia partnerships

The upcoming Phase I Infrastructure of Technopark@iitk is a state-of-the-art green architecture with two-and-a-half lakh square feet of space. The six floors including the Ground Floor are built around a central atrium. Housed within IIT Kanpur campus, the building has provisions for:

- 500-10,000 square feet units.
- Conference & Meeting rooms, Auditorium.
- Cafeteria/Creche.
- Recreational facilities.

Following companies have expressed their interest to be a part of Technopark@iitk:

- Laurus Labs
- POCT Group of Companies
- Technithon International
- TVM Signalling and Transportation Systems
- TISA Aerospace, GCRS, Medetronix, HRMac Technologies.

SAMTEL CENTRE FOR DISPLAY TECHNOLOGIES AND NATIONAL CENTRE FOR FLEXIBLE ELECTRONICS

The Samtel Centre for Display Technologies, known more popularly as Samtel Centre or SCDT, is a multi-disciplinary research and development centre which caters to prototype building and eventual productisation of technology related to Flexible Electronics. The area of focus broadly includes large area electronics which are typically printable and are likely to be built on an organic electronics base. The ideas explored at the centre are necessarily linked to a real-world application with some practical value. The prototype building and productisation are carried out primarily at its industry outreach arm - which is the National Centre for Flexible Electronics (FlexE Centre) - typically with active involvement and participation of industry partners right from the early stages of development and product conception.

The National Centre for Flexible Electronics (NCFlexE, also known as the FlexE Centre) was set up as a Centre of Excellence at the Indian Institute of Technology (IIT) Kanpur in 2014 with financial support from the Ministry of Electronics and Information Technology (MeitY), the Government of India, and IIT Kanpur. The vision of this Centre consisting in catalysing the development of domestic industry in the field of large area flexible electronics is being executed with the Centre serving as a bridge between the academic ecosystem and the industrial ecosystem.

Summary of the various activity parameters for the centre for the last financial year are listed below:

- Patents filed - 4
- Publications - 7
- NDA with industries - 7
- Ongoing projects - 6
- New projects with Industry partnerships - 2

Technology Transfer

Two technologies developed at NCFlexE, IIT Kanpur on a watch, and a smartwatch for the blind and visually impaired are licensed to Ambrane India. A formal MoU was signed by the Tech Transfer Office in the Directorate on February 2, 2023.

Outreach Activities

Participation and exhibition in the following events

- Digital India Week 2022 Expo 'Digital Mela' in Gandhinagar Gujarat from 4th July to 8th July 2022
- ELCINA Industry Meet on Enabling Electronics, Semiconductor & Display Industry in Gujarat – Ecosystem Opportunities for National & State ESDM Industry" in Gandhinagar Gujrat on 11th November 2023
- Roadshow on an International Exhibition on Printing and Allied Machinery Industries at Bangalore on 24th February 2023
- Roadshow, an International Exhibition on Printing and Allied Machinery Industries at Haridwar on 3rd March 2023

- International Exhibition on Printing and Allied Machinery Industries at Mumbai from 27th March 2023 to 30th March 2023.

SCDT- FLexE Centre Webinar Series

SCDT and FlexE Centre Webinar Series brings together every month scientists, engineers, researchers, students, entrepreneurs, and industry players involved in different aspects of flexible electronics from around the country (and sometimes from outside India as well) on a common platform. Speakers in these monthly one-hour webinars are accomplished individuals in any field associated with flexible electronics. This forum is helping improve interactions between the different stake holders in the technology as it evolves. All details can be found at https://www.iitk.ac.in/scdt/webinars.html

The 2023 Kanpur Lectures Series on Engineering and science in our world by Professor Sandip Tiwari

A five-part lecture series was organized on Engineering and Science in our world by SCDT and supported by Electrical Engineering. The lectures were given by Professor Sandip Tiwari, Charles N. Mellowes Professor of Engineering at Cornell University, USA and Distinguished Visiting Professor, IIT Kanpur. The fourth talk in this series was also the Professor K.R. Sarma Distinguished Lecture for 2023.

Awards and Honors

- Professor Monica Katiyar was elected a Fellow of the Indian National Academy of Engineering - 2022.

- Ms. Aakanksha Jain (PhD student) received "Augmenting Writing Skills for Articulating Research (AWSAR) Award 2022" under the Best Stories in PhD category sponsored by the Department of Science and Technology (DST), India.

NATIONAL AEROSOL FACILITY

The establishment of the National Aerosol Facility (NAF) at IIT Kanpur, supported by the Department of Atomic Energy (DAE) reflects our nation's ambition for lateral knowledge translation to serve the purpose of academia involvement in Nuclear Safety Studies. This is a distinctive experimental facility which aims to study the phenomenon that governs the generation and transport characteristics of the radionuclides expected to be released in the aerosol form during a postulated reactor accident scenario in the context of Indian Pressurized Heavy Water Reactors (PHWRs). While most of the global research is relevant to Boiling Water Reactors or Pressurized Water Reactors, NAF caters to the needs of PHWR safety research and is a first of its kind for aerosol behavioral studies in southern Asia.

Specifically, the established facility would help the researchers to evaluate the accidental source terms to the environment,

from the viewpoint of Impact Assessment (IA). It also aims to establish a database on the physical properties of materials of nuclear relevance that are important inputs for numerical codes used in safety analyses. The facility has been built as a collaboration between BARC, BRNS and IIT Kanpur. Experimental programs are conceptualized for performing R&D studies for quantifying aerosol retention in Primary Heat Transport systems for different input conditions reflected by postulated nuclear reactor accident scenarios. This test facility can also be useful for aerosol researchers within the country and for carrying out intercomparison and benchmarking experiments with international collaborators.

The National Aerosol Facility is designed for a pressure of 10 bar and a temperature of 400℃. The maximum operating pressure of this facility is restricted to 5 bar and the maximum operating temperature is restricted to 350℃. NAF has a Programmable Logic Controller (PLC) based control system on a high-speed data transfer network using a SCADA system, for the centralized monitoring & control of the experimental facility.

The first project on NAF was aimed at the design, fabrication, installation, and commissioning of a state-of-the-art National Aerosol Facility (NAF) along with its peripheral systems such as aerosol and steam generator, steam/gas injection and mixing system, exit gas scrubbing system, etc., and associated process and aerosol instrumentation systems and then to study on aerosol behavior under severe accident conditions in the context of Indian nuclear reactor. This project which began in April 2015 was completed in March 2022. Ten members of the research staff and five doctoral candidates have undergone training in this facility.

Within this time period, many research accomplishments occurred which were the first of its kind. The study on the interaction of caesium-bound fission products aerosols with abundant inorganic compounds of the atmosphere and their hygroscopic properties was achieved which was never done before. A new mathematical model was developed where aerosol microphysics of particles were examined for the charge effect. This charge-coupled model was validated experimentally, and later coagulation was also included in the model for charge effect. The developed model is fast and numerically stable. It can be used for several applications involving coagulation dynamics of charged aerosol particles. Studies on Cloud Condensation Nuclei (CCN) activity of fission product aerosols and their effect on the size and other properties were also accomplished which is very important in the event of radioactive release to the humid environment. Different depositional mechanisms of aerosols were studied and their resuspension in a piping system that resembles the Primary Heat Transport (PHT) system of an Indian nuclear reactor. Research was carried out on the aerosol measurements technique that is to be deployed for the NAF piping system and the way to reduce the anomalies that arise during measurement were achieved. The optimization of the controlling parameters of the aerosol generation was done to achieve a high

concentration of the aerosols that are speculated to be released during a reactor worst-case accident.

The facility conducted pilot tests in a segment of straight test piping during October 2022. The research was conducted by a team from RP&AD (BARC), RSD (BARC), and IIT Kanpur. The goals of the experiment were to characterize the aerosol mass concentration at the mixing vessel's outlet and at the straight test segment, which was eight meters in length.

Recently a new project was signed with RSD, BARC named 'Aerosol Transport Behaviour Experiments at National Aerosol Facility in Context of Nuclear Reactor Accidents' in April 2023 and a cluster project (4-5 feeder projects) named 'Studies in National Aerosol Facility for generating database of Aerosol behaviour under severe reactor accident scenarios for Indian PHWR" with RPAD, BARC. This facility is in advanced stage.

NAF has hosted a wide array of other innovative projects aimed at addressing air pollution in India in the year 2022-2023. These projects in large under this facility are as diverse as the regions they serve, and they involve 48 dedicated staff members, working towards cleaner air for all. These projects are:

- Centre of Excellence in Advanced Technologies for Monitoring Air-quality indicators (ATMAN), https://atman.urbansciences.in/, approved by PSA office, Government of India which is currently executing 3 projects supported by a group of philanthropic funders, including the Bloomberg Philanthropies, the Open Philanthropy, and the Clean Air Fund. All together there

are 14 Post Docs, one Consultant, Research Engineers, One Project fellow.

  - "To Support the Rural Air Quality Monitoring Project" sanctioned by "OPEN philanthropy".
  - "Dynamic Hyper-Local Source Apportionment for Real-Time Policy Action" sanctioned by "Clean Air fund".
  - "Atman-Centre of Excellence: Core Support Grant" sanctioned by "BLOOMBERG Philanthropy".

- "DHSA at Kanpur" sanctioned by "RITES, India".
- "Contribution To Research for Clean Air Project in India" sanctioned by "Swiss Agency for Development and Cooperation, Switzerland".
- "Testing And Efficacy of Pure Skies under Different Conditions of Temperature Humidity Wind Speed and Distance" sanctioned by "DEPL".
- "Building Capacity to Improve Air Quality in South Asia: Reducing PM 2.5 Through Low-Cost Sensor Network Driven Policy Decisions" sanctioned by "Duke University".
- "Integrated Online Air Pollution Monitoring and Decision Support System" sanctioned by "Clean Air Fund".
- "Study On Effect of Coal Blending on Ambient Air Quality and Management of Fly Ash" sanctioned by "UDUPI Power Corporation".
- "Testing The Efficacy of Pure Skies in Real Field Conditions at A City Deployment" sanctioned by "DEPL".

- “Service Agreement to Carry Out Chemical Analysis of The Air Samples” sanctioned by “Centre for Study of Science Technology and Policy”.
- “Easiur India: Development of Air Quality Modeling Decision Support Tools for Policy-Makers” sanctioned by “International Sustainable Energy Foundation”.

NATIONAL CENTRE FOR GEODESY

The National Centre for Geodesy (NCG) at IIT Kanpur was set up on July 1, 2019, with the support of the Department of Science and Technology (DST), Govt. of India. NCG is the first of its kind centre in India to support educational and research activities in the field of Geodesy. The centre is established as a solution to the limited national-level education in the country on Geodesy and other aligned areas with the primary aim of acting as a hub of excellence in teaching and research at the national and international levels. The primary objective of the NCG is to nucleate and strengthen the activities in the field of geodesy education, capacity building, and academic research and development. During the last year, NCG has taken up various tasks in line with its objectives. NCG has organized three short-term courses/workshops/training in the field of geodesy and allied areas, which were attended by participants from a diverse range of stakeholders, including Academia, Industry, Military, and Government. In addition to the short-term training, NCG has organized a brainstorming session on understanding the synergies between geodesy and oceanography, which was attended by senior personnel of nine different organizations.

A total of eight PG students were supported by the NCG for training at different national and international institutes, of which two have received Ernst Mach Grant to continue their research training at TU Wien in space geodesy. Moreover, internships have been offered to the four non-IIT Kanpur and three IIT Kanpur graduate students. Any interested student/researcher from any institute can apply for an internship at the NCG by filling out an internship form available on the NCG website. Selected students are provided a stipend as per the prevailing norms of the Centre for Continuing Education (CCE), IIT Kanpur

NCG is also committed to supporting up to 12 DIIT and 6 MS (by Research) students, as per the IIT Kanpur guidelines. These students have to pursue their thesis in geodesy or allied areas. The DIIT program is initiated mainly to attract working professionals from Government departments/ institutions, industry, and faculty members in academic institutions involved in teaching and R&D in geoinformatics.

NCG has been undertaking research initiatives in a wide domain of geodesy. A few of the main initiatives include:

- **Project Saptarshi:** Establishment of the first space geodetic technique core observatory in India.
- **Indian Geodetic Reference Frame (InGReF):** Redefining the Indian geodetic datums, i.e., horizontal, vertical, gravity, and tidal datums.
- **Cal/Val for NISAR mission:** Establishing corner reflectors for the calibration of the upcoming NASA-ISRO combined SAR mission.

- **IDS station in India:** Establishing the first DORIS station in India, a technique for precise orbit determination.

In addition to these, recently NCG has collaborated with the Survey of India (SoI) to work on four joint projects that include i) Analysing the best strategy for Indian gravimetric geoid modelling, ii) Geoid testing and validation, iii) Exploring the geodetic applications using CORS, and iv) Finalising the strategy for a way forward to establish Indian geodetic datums.

Regarding collaboration, NCG staff and students have collaborated with primarily Curtin University and University of Melbourne, Australia, TU Wien, Austria, GFZ Potsdam, Germany, Technical University of Konya, Turkey, and Hanoi University of Mining and Geology, Vietnam. These are in addition to the other collaborations which NCG has developed within Project Saptarshi. Further, NCG personnel are actively participating in the joint study/working groups of the International Association of Geodesy. Thus, NCG has been collaborating with researchers from numerous institutes in the world who are pursuing academia and research in geodesy. Also, following the meeting on 18th November 2022 with the Russian delegate at the 2nd UNWGIC, NCG is working with the Moscow State University of Geodesy and Cartography to sign an MoU for various activities including but not limited to the collaboration with academia and research in geodesy and allied areas. NCG has already signed MoUs with 10 organizations in India for various activities. These are in addition to the MoUs that IIT Kanpur has with different international Institutes for academic and research exchange programs. To strengthen the collaboration

among the national institutes, NCG has planned to set up a “Society of Geodesy”.

Further, NCG is committed to acting as the national resource centre, i.e., making available its resources to other Indian institutions for education and training purposes. In view of this, the NCG library is being set up with the primary aim of establishing a literature bank on the fundamentals of Geodetic Science and its applications and thereby make available the same to all interested. It already consists of ~50 books/manuals on the subject of geodesy and allied areas. A cloud-based service is also being planned at the NCG to provide various stakeholders access to the available software at the NCG. The permanent GNSS station at NCG, which was part of the Asia-Pacific Reference Frame has now been included in the IGS network. Hence, its data is also freely available to all interested. Following the latest geospatial guidelines, NCG is committed to sharing the geodetic data from the NCG facilities as and when requested for educational and research purposes.

Further, to spread Geodesy education and R&D in India and contribute towards the growth of Indian geodetic infrastructure, six Regional Centres for Geodesy (RCGs) have been established to work in tandem with NCG in a hub-and-spoke model. The six RCGs are established at: IIT Bombay, IIST Trivandrum, IRS Anna University, IIT (ISM) Dhanbad, MNNIT Allahabad, and MANIT Bhopal. The NCG will provide some initial handholding in terms of training students, researchers, and faculty members in Geodesy in these RCGs.

THE MEHTA FAMILY CENTRE FOR ENGINEERING IN MEDICINE

The Mehta Family Centre for 'Engineering in Medicine (MFCEM)' will leverage the existing engineering strength of IIT Kanpur and the biomedical research emphasis of BSBE faculty to enable a fast growth in the initial phase of the new "Centre for Engineering in Medicine". The centre will allow the department to focus on 'engineering solutions to medical problems,' while allowing it to grow in terms of personnel (faculty, post-doctoral fellows, students and project employees); academic programs (integrated PhD, MS by research and more minors for UG students) and infrastructure (new building). The centre will initially focus on three main areas: Regenerative Medicine, Molecular Medicine and Engineering, Digital Medicine. The major achievements of the centre in the year 2022-2023 are listed below:

Awards/ Honors

- Professor Sandeep Verma received the 5th Pran Nath Vohra Oration, Punjab University.
- Professor Sandeep Verma was awarded Gold Medal by The Society for Materials Chemistry, BARC.
- Professor Bushra Ateeq delivered an invited talk in "CNR Rao Endowed Lecture Series".
- Professor Bushra Ateeq was featured in the "Vigyan Vidushi- 75 Women Trailblazers of Science".

- Professor Bushra Ateeq was featured in the “The Torchbearers of Indian bioscience- Profiling India’s Top 20 Promising Bioscience Innovators”.
- Professor Bushra Ateeq was featured in Entrepreneur India magazine under "Shepreneurs Women to Watch", 2023.
- Professor Nitin Gupta was awarded The C.N.R. Rao Faculty Award (2020).
- Professor Ashok Kumar has been chosen by the National Academy of Medical Sciences. (NAMS) for the ‘Dr. Nandagudi Suryanarayana Rao Academic Award’.
- Professor Dhirendra Katti was awarded the Tata Innovation Fellowship, from DBT India.

Fellowships to the Academies

- Professor S. Ganesh has been elected Fellow of Indian National Science Academy, 2022.
- Professor Arun Kumar Shukla has been elected Fellow of Indian National Science Academy.
- Professor Bushra Ateeq has been elected as Member (2022) of the Guha Research Conference (GRC).

Recognition/Chair Positions

- Professor Dhirendra Katti was awarded the Rajeeva and Sangeeta Lahri Chair Professorship.
- Professor Bushra Ateeq has been conferred the Joy Gill Chair (April 2022).
- Dr. Pragathi Balasubraman has been awarded The Anjali Joshi New Faculty Fellowship award.

Grants and Fellowships

Around 4 research grants and fellowships have been sanctioned to various faculty members from funding agencies like DBT, Lenek Technologies, SIIC Startup, ICMR and BIRAC-PACE.

Patents

Around 4 patents were granted, and 2 were filed in the year 2022-2023.

Events

Invited Talks/Lectures: A total of 41 invited talks and lectures were organized, where distinguished MFCEM faculty members shared their expertise and insights with the academic community. These talks covered a wide range of research areas, contributing to the dissemination of knowledge and promoting academic dialogue.

MFCEM Dialogues: MFCEM organized interactive events known as MFCEM Dialogues, featuring esteemed speakers who are stalwarts in their respective research fields. Eminent personalities such as Prof. Noel Buckley from the University of Oxford, Prof. Shyni Varghese from Duke University, Prof. Sriram Subramaniam from the University of British Columbia, Prof. Nitish Thakor from Johns Hopkins University, Prof. Suman Chakraborty from IIT Kharagpur, and Matt Abrahams from Stanford Graduate School of Business graced these events, fostering intellectual exchange and inspiring the academic community.

MFCEM Workshop: Mr. Rafeeque Mavoor conducted a workshop on scientific illustrations, enhancing the visual representation of research findings. Additionally, Dr. Sarah Hyder Iqbal delivered a session on science and public engagement, emphasizing the importance of effectively communicating scientific knowledge to the public. The workshop provided valuable insights into these critical aspects of scientific research.

Joint Seminars and Colloquia: Collaborative efforts were made with other departments and institutions to organize joint seminars and colloquia. Notable speakers included Professor Chandrasekhar Kanduri from the University of Gothenburg, Professor Amitabha Chattopadhyay from CSIR-CCMB, Hyderabad, Dr. Jeremy N. Burrows from Medicines for Malaria Venture, Geneva, and Professor Saman Habib from CSIR-Central Drug Research Institute, Lucknow. These joint events facilitated interdisciplinary discussions and promoted cross-pollination of ideas.

Conference Seminars: Professor Ashok Kumar organized the International Conference on "Recent Advances in Biomedical Sciences & Regenerative Medicine, 2022," providing a platform for researchers to present and discuss their work in the field. Professor Bushra Ateeq organized mini-symposia under GATI, focusing on "Breaking the Glass Ceiling in Academia," aiming to address gender disparities in academic careers.

Publications: The faculty members of MFCEM have made significant contributions to research with around 67 peer-reviewed publications. These publications represent the dedication and expertise of the faculty in advancing knowledge and making valuable scientific contributions.

Student Achievements: The students of MFCEM have also excelled in their academic pursuits. Sakshi Goel, a Ph.D. student under the guidance of Prof. Bushra Ateeq, was awarded the prestigious INSA Medal for Young Scientists 2022. Nabodita Sinha, a student of Professor Ashwani Kumar Thakur, received the Carl Storm International Diversity Fellowship, recognizing her contributions to the field.

These achievements and initiatives demonstrate the commitment of MFCEM faculty to promoting knowledge exchange, fostering academic excellence, and nurturing a culture of research and collaboration. The efforts made by MFCEM have not only contributed to the advancement of scientific knowledge but also recognized and celebrated the achievements of students.

GANGWAL SCHOOL OF MEDICAL SCIENCES AND TECHNOLOGY AT IIT KANPUR

Hon'ble Union Minister of Education and Skill Development & Entrepreneurship, Shri Dharmendra Pradhan ji laid the foundation stone of the Gangwal School of Medical Sciences and Technology and Yadupati Singhania Super Speciality Hospital at IIT Kanpur campus on 16th July 2022 by unveiling the plaques. The ceremony was presided over by Dr K Radhakrishnan, Chair-

man, Board of Governors, IIT Kanpur. The medical school donors Shri Rakesh Gangwal, Co-Founder, Indigo Airlines; Singhanias of JK Cement Ltd.; Shri Muktesh Pant, Founder, Micky and Vinita Pant Charitable Foundation; Shri Hemant Jalan, Founder, Indigo Paints Ltd.; and Shri Gaurav Sharma, VP, India Software Labs, IBM India Pvt. Ltd. graced the occasion.

Gangwal School launched its website (https://gsmst.iitk.ac.in/) and Newsletter "Svasthya" (https://gsmst.iitk.ac.in/svasthya-pdf/) in December 2022.

Tata Consulting Engineers Limited (TCE) was onboarded as Project Management Consultant for the project. Both Hosmac India Pvt. Ltd. and TCE are working with IIT Kanpur team on collating the procurement and design drawing for a composite tender for the Medical School. The tender for the construction of Gangwal School was published in CPP Portal on 3rd March 2023 and several potential bidders attended the pre-bid meeting.

The tender for the construction of studio apartments for Resident doctors and Campus development of the School Complex with funding support from REC Foundation and IBM India Pvt Ltd. has been initiated in the allocated site for Gangwal School at IIT Kanpur Campus. Campus development including boundary walls, road development, landscaping, etc. is going on. At present, the casting of slab up to G+4 is completed for the residential block at the site as shown in the image.

Research & Development: As part of futuristic medical technology, eleven R&D centres of excellence (CoE) have been planned. A few of the CoEs have been recognized by donors for funding. These CoEs will be executed phase-wise and will be delivered to the society and country.

As part of CoE in Cardiovascular and Pulmonary Disease Research, an ambitious multidisciplinary project 'Hridyantra' working to develop a new generation indigenous Left Ventricular Assist device (LVAD) is progressing towards animal trials. IIT Kanpur team with expert clinicians aim to develop superior performing, better hemocompatible, and low-cost LVAD, making its implantation affordable to a substantially greater fraction of people suffering from end-stage heart failure.

Several activities including symposia, seminars, team visits,

- AI in Healthcare
- Cancer Research
- Cardiovascular & Pulmonary Disease Research
- Metabolic Disorders
- Neuroscience, Neurotechnology & Mental Health
- Non-invasive Medical Imaging & Diagnostics
- Orthopaedics & Prosthetics
- Point-of-care Diagnostics
- Therapeutics
- Telemedicine & Robotics
- Tropical & Infectious Diseases

and workshops are being conducted by the R&D team to actively engage in the MedTech domain. A few of the activities are as follows:

IIT Kanpur and the Gangwal School hosted a one-day national workshop on Telemedicine and Artificial Intelligence on 2nd July 2022 at IIT Kanpur Outreach Centre in Noida.

The Gangwal School, IIT Kanpur, organized a closed-door workshop for the Hridyantra program dedicated to the development of the LVAD.

A team of three faculty members from IIT Kanpur namely Professor S K Mishra, Dr. Soumya Ranjan Sahoo and Dr. Priyanka Bagade, CoE Telemedicine & Healthcare Robotics participated in Indian Mobile Congress 2022 held on 1-4 October at Pragati Maidan, New Delhi on the invitation of Tata Communications Tech. Ltd.

A two-member delegation from Tata Telecommunications, Mr. Sanjeev Srivastava & Mr. Sujoy Jain visited CoE in Telemedicine and Robotics team members at IIT Kanpur on 7th November

2022.

The Gangwal School organized an event as part of the Pant Workshop Series on Medical Sciences and Technology with the joint participation of IIT Kanpur – Swansea University (United Kingdom) on Cardiovascular & Pulmonary Flows on 12th December 2022.

Dr. Devi Shetty, Chairman, Narayana Hrudayalaya Limited; Mr. Yashdeep Kumar, Global Director, Stryker Technology Centre at Stryker Corporation, USA; Professor Pratap S. Khanwilkar, Founder & CEO, Ignition Key LLC, Texas; etc. visited LVAD team. They are closely associated with the Hridyantra project from the beginning and mentor the fellows in the project.

The Gangwal School and CoE in Orthopaedics and Prosthetics, supported by SPARC-MoE organized an event as part of the Pant Workshop Series on Medical Sciences and Technology "Advances in Designing and Manufacturing Technologies for Orthopaedic Biomaterials" on 13th & 14th March 2023.

Academic Relations & Partnerships

At present, the following seven faculty have been appointed for the Gangwal School:

Dr. Vikram Mathews	Professor & Director, Department of Hematology, Christian Medical College & Hospital, Vellore	Distinguished Visiting Professor
Mr. Yashdeep Kumar	Global Director, Stryker Technology Centre at Stryker, USA	Adjunct Professor
Dr. Saurav K. Bhunia	Principal R&D Engineer, Cardiovascular Systems, Inc, USA)	Adjunct Professor
Professor Saroj Kanta Mishra	Former Professor, Department of Endocrine Surgery, SGPIMS, Lucknow	Distinguished Visiting Professor
Dr. Nazneen Aziz	Former President and CEO, Variant Genomics, Inc, USA	Visiting Professor
Professor Krishnan Ganapathy	Director, Apollo Telemedicine Networking Foundation & Apollo Tele Health Services, Chennai	Distinguished Visiting Professor
Professor Pratap S. Khanwilkar	Founder & CEO, Ignition Key LLC, Texas	Visiting Professor of Practice

An MoU with Apollo Hospitals was signed for research in the clinical application of Artificial intelligence, Telemedicine, Genomics, and other areas of mutual interest in healthcare technology.

Discussion at various levels for collaboration is ongoing with the University of Melbourne, Imperial College London, Australian National University, etc.

CHANDRAKANTA KESAVAN CENTRE FOR ENERGY POLICY AND CLIMATE SOLUTIONS

The Indian Institute of Technology, Kanpur (IITK) has established the Chandrakanta Kesavan Centre for Energy Policy and Climate Solutions to assist policy makers with practical solutions to the problems of climate change. India as a signatory to the Paris Climate Agreement will need to develop, adapt and implement technologies to reduce emissions and grow sustainably. The Centre can spearhead the development of technology and policy solutions to help India and the world combat climate change. The Centre is named after Dr. Chandrakanta Kesavan, who pioneered the entry of Indian women in the fields of science and engineering. The Centre was made possible by a gift from Alka and Sudhakar Kesavan to IIT Kanpur. Sudhakar Kesavan graduated from IIT Kanpur with a B.Tech in Chemical Engineering in 1976.

The main objectives of the Centre are

- To spearhead energy and climate policy solutions to help India address climate change related problems.
- To emerge as a platform for bringing together eminent academics, technologists, researchers and policy makers to discuss and address energy policy and climate issues.
- To strengthen and promote outreach, communication, grassroots engagement in the areas of energy policy and climate change issues.
- To help IIT Kanpur campus to become carbon neutral.

Highlights (2022-2023)

- Chandrakanta Kesavan Lecture Series: Initiated in the centre, this series featured nine lectures by eminent personalities from academia and industries. The lectures covered topics such as energy solutions, air quality challenges, and solar PV, enriching knowledge in these fields.
- Symposium on "Demystifying UNFCCC Conference of Parties (CoP)": Held on 02 March 2023, the symposium aimed to provide insights into the international negotiations versus local climate action. Scholars, researchers, and environmental scientists attended, with a focus on shaping relevant programs aligned with India's requirements.
- Symposium on "India's Sustainable Future: Challenges and Opportunities vis-à-vis Global Perspectives": Conducted on 12 October 2022, this symposium brought together policy makers, climate and energy experts,

and academicians. The objective was to exchange perspectives on emerging energy and climate policies, technology, sustainability, and related subjects, fostering strategic collaborations.

- Workshop on "Developing an actionable approach to Carbon Neutrality": Organized on 11 October 2022, this workshop addressed the pressing issue of greenhouse gas emissions and ecosystem restoration. Stakeholders from Kanpur, Pune, and other regions discussed the topic and developed actionable approaches to progress towards NetZero practices.

SHIVANI CENTRE FOR THE NURTURE AND RE-INTEGRATION OF HINDI AND OTHER INDIAN LANGUAGES (OILS)

Shivani Centre for Nurturing and Integration of Hindi and Other Indian Languages is committed to serve as the focal point of providing a soft landing to the students of IIT Kanpur. Shivani Centre aims to actively engage with the IIT Kanpur students, arriving from remote locations, and provide language assistance. In parallel, Shivani centre strives to promote faculty members and tutors alike to create and translate pedagogical content in Hindi and other Indian languages. The translation and creation of pedagogical content is expected to provide repository of materials to build fundamental concepts, while not losing out those due to pace with teaching in English language. In addition, the steering committee will also promote teaching in bilingual mode in order to facilitate the in-class

learning and grasping of concepts effectively, mitigating the disadvantages to students from remote locations.

Recent activities:

- The three days Literature Festival, 'Akshar,' was hosted by the "Shivani Centre" to commence the centenary year celebration of the life and work of Shivani Ji.
- A podcast was hosted by Mr. Amit Varma on “The life and Times Mrinal Pande: The Seen and Unseen of”.

OFFICE OF INTERNATIONAL RELATIONS

New Partnerships

IIT Kanpur has signed several new partnership agreements with universities in Asia, Europe and North America. These new partnerships include:

1. **Asia** - Niigata University and Yokohama National University, Japan for cooperation in the areas of faculty and student exchange, joint research activities and exchange of academic materials and publications.
2. **Europe** - Lund University and KTH Royal Institute of Technology in Sweden for cooperation in the areas of faculty and student exchange, joint research activities and exchange of academic materials and publications; and Fondazione Istituto Italiano di Tecnologia, Italy for exchange of students, organizing joint seminars/workshops, joint research and development of joint laboratories.

3. **North America** – University at Buffalo, USA for setting up a collaborative research centre with IIT Kanpur; Rice University, USA for shared research and industry engagement in the areas of engineering, science, medicine, humanities and business; University of California Santa Cruz, USA for cooperation in the areas of faculty and student exchange, joint research activities and exchange of academic materials and publications; and University of Alberta, Canada for a joint doctoral degree program.

Establishment of New "Collaborative Research Centre" with University at Buffalo

Delegation from University at Buffalo

In March 2023, IIT Kanpur signed an agreement with University at Buffalo to set up the *"*IIT Kanpur-UB Centre of Excellence in Biomedicine and Bioengineering*"*. The research focus of this Centre will be on developing materials and technologies for both *in vitro* and *in vivo* applications in biosciences. This is in continuation of the MoU that was signed in May 2022 for the purpose of research collaboration as well as Joint Degree Program at the Doctoral level with University of Buffalo.

Establishment of Joint "Research Grant Awards" with Rice University

In November 2022, IIT Kanpur and Rice University signed a cooperation agreement to explore and participate in collaborative teaching, training, research, and other activities. This agreement builds on the previous agreement signed between IIT Kanpur and Rice University for pursuing collaborative research in the specific areas of Energy/Environment, Healthcare/Biomedical Sciences/Biomedical Engineering and Data Science/Information/Computer Science & Engineering. In an effort to further facilitate research collaboration between faculty at IIT Kanpur and Rice University, the first call for *"Rice-IITK Strategic Collaboration Awards"* was announced in April 2023. The awardees of this program (to be announced in July 2023) will receive seed funding that will enable faculty and student exchange and is expected to lead to joint research grants, joint publications, and joint patents.

Joint Degree Programs

Signing of the Joint Degree Program agreement between IIT Kanpur and University of Alberta

IIT Kanpur signed a Joint Degree Program agreement for doctoral students with University of Alberta, Canada in January 2023. IIT Kanpur now has Joint Degree Partnerships with 13 universities spread across four continents:

1. **North America**: Five Universities including University of Alberta, Canada; Iowa State University, USA; Drexel University, USA; New York University, USA; and University at Buffalo, USA
2. **Asia**: Four Universities including Asian Institute of Technology, Thailand; National Yang Ming Chiao Tung University, Taiwan; and National University of Singapore, Singapore
3. **Europe:** One University – University of Heidelberg, Germany

4. **Australia:** Three Universities including University of Melbourne, La Trobe University and Curtin University

A total of 60+ students from IIT Kanpur are currently pursuing their doctoral degree as part of one of these joint degree programs.

Visits of Foreign Delegations to IIT Kanpur

Several foreign university delegations visited IIT Kanpur in 2022-23 to discuss possibilities for academic and research collaborations. Many of these have led to fruitful relationships between IITK and the partner University abroad and some of them are part of an ongoing collaboration.

- **From Australia,** delegations from the Australian National University (ANU) and the University of Melbourne (UoM) visited IIT Kanpur. As an outcome of these visits:
  - UG students from IITK would participate in the **"**Future Research Talent" program at ANU that is aimed at nurturing the research interest of UG students interested in taking up research as a career.
  - UoM faculty who visited identified potential faculty collaborators at IIT Kanpur.

- **From USA,** delegations from Rice University, University of California Santa Cruz and University at Buffalo visited IIT Kanpur to sign agreements. All these delegation visits were primarily aimed at strengthening an existing relationship.

Signing of the agreement between IIT Kanpur and University of California Santa Cruz, USA

- **From Canada,** the University of Alberta delegation visited IIT Kanpur to formalize a "Joint Degree Program" at the Doctoral level between IITK and University of Alberta.
- **From Nepal,** Lumbini Technological University (LTU) and Tribhuvan University (TU) visited IIT Kanpur. As an outcome of these visits:
    - LTU is a new University being set up in Nepalgunj, Nepal which is ~300 kms from Kanpur. IITK has been identified by LTU leadership as a potential partner/mentor in its formative years. IITK has offered to help LTU with the establishment of its academic curriculum and academic programs.

- TU has initiated a new program in Aerospace Engineering and visited IITK to start a collaboration with the Department of Aerospace Engineering at IITK.

IIT Kanpur Visits Overseas

Australia

IIT Kanpur's Delegation Visiting Australian National University, Australia

A delegation from IIT Kanpur visited leading universities in Australia in March to strengthen ongoing relationships and to explore new opportunities for collaborations. The delegation included Professor Abhay Karandikar, Director; Professor S. Ganesh, Deputy Director; Professor Dhirendra S. Katti, Dean of International Relations; Professor Kantesh Balani, Dean of Resources & Alumni; Professor SC Srivastava, Director, IIT Kanpur-La Trobe University Research Academy; Professor Priyanka Ghosh, Academic Program Director, IIT Kanpur-La Trobe University Research Academy; and Professor Sandeep Verma, Professor, IIT Kanpur and Adjunct Faculty, La Trobe University. The delegation toured and met with officials at

Curtin University (CU), University of Melbourne (UoM), La Trobe University (LTU), Australian National University (ANU) and University of New South Wales (UNSW). As an outcome of this visit:

- **With CU** – IITK plans to enhance the ongoing Joint Degree Program by increasing faculty participation in collaborative research projects.
- **With LTU** - IITK is exploring new avenues of collaboration with LTU – Inclusion of an Industry partner as part of the IITK-La Trobe University Research Academy.
- **With UoM** - IITK plans to expand the ongoing relationship with UoM by including new programs such as summer and winter internships, semester exchange and possibly other joint degree programs.

With ANU – Professor Russell Gruen, Dean of College of Health and Medicine at ANU has been offered a Distinguished Visiting Professor position at IITK. Professor Gruen is widely published, and has a wealth of experience in medical education, research, and clinical practice. In addition, IITK is currently exploring the possibility of a Joint Degree Program at the Doctoral level with ANU.

Professor Dhirendra S. Katti, Dean of International Relations, IIT Kanpur attended the Southeast and South Asia and Taiwan Universities (SA-

TU) General Assembly in November 2022 where he met Professor Huey-Jen Jenny Su, President National Cheng Kung University (NCKU) & SATU Chairperson and Professor Jerzy Duszynski, President Polish Academy of Sciences and discussed strategic partnerships with IIT Kanpur. Professor Katti also visited National Yang Ming Chiao Tung University (NYCU) and National Tsing Hua University (NTHU) with whom IITK has ongoing academic and research collaborations. Consequent to this visit, Professor Karandikar, Director IIT Kanpur has been invited to be a member of the Steering Committee of the SATU Presidents' Forum.

Professor Dhirendra S. Katti, Dean of International Relations, represented IIT Kanpur at the 'India–Vietnam Business and Investment Summit' held at Ho Chi Minh City, Vietnam. The event focused on cooperation between India and Vietnam in the fields of education, healthcare, and IT. On the education front, the discussion centred on the areas of collaboration between Indian and Vietnamese Universities so as to promote student and faculty exchange. The summit also aimed at increasing the presence of Indian Universities in Vietnam.

Financial Aid to Foreign Students

Beginning 2022-23 I Semester, IIT Kanpur instituted fellowships for foreign students admitted in postgraduate programs. All foreign students admitted in a Masters or PhD program and who do not have any other scholarship/funding are now eligible to receive the Institute Fellowship at par with that of Indian students. So far, four students from Nepal, Bangladesh and Ethiopia have benefited from this fellowship.

Foreign Students at IIT Kanpur

IIT Kanpur hosted 34 foreign students in 2022-2023 with 25 of them pursuing a post-graduate degree at IITK, 03 for semester exchange and 06 for internships.

The 25 students pursuing a post-graduate degree are from countries such as Bangladesh, Jordan, Indonesia, Bhutan, Syria, Ethiopia, Sudan, Iran, Nepal, and Myanmar. The degrees being pursued by these 25 students are as follows:

- 13 are pursuing a PhD degree and
- 12 are enrolled in a Masters program

In addition to this, IIT Kanpur has also hosted six internship students from Bhutan, Australia, Bangladesh and Nigeria.

Three undergraduate students from Ecole Nationale Supérieure d'Arts et Métiers (ENSAM), France are currently at IIT Kanpur for two semesters under an exchange program between IIT Kanpur and ENSAM.

Short-Term Courses for Foreign Working Professionals

In 2023, IITK organized three courses under the Indian Technical and Economic Cooperation Programme (ITEC), the leading capacity building platform by the Ministry of External Affairs, Government of India.

Participants of the ITEC course on Robotics

IITK offers various courses under ITEC every year and in 2023, the courses offered by IITK were:

- ***Data Science for Managerial Decision-Making:*** Course taught by Professor Faiz Hamid and Professor Deep Mukherjee
- ***Strategic HRM for Organizational Excellence:*** Course taught by Professor Amit Shukla
- ***Robotics:*** Course taught by Professor Ashish Dutta, Professor Mangal Kothari and Dr. Anjali Kulkarni

These short-term courses were aimed specifically at working professionals from ITEC partner countries such as Bangladesh, Ethiopia, Mongolia, Morocco, Myanmar, Tajikistan, Malawi, Algeria, Vietnam, Cambodia and Palestine. Over 50 students participated in these courses held offline at IIT Kanpur.

IIT Kanpur Student Mobility Overseas

- 70+ undergraduate students from IIT Kanpur were nominated for semester exchange at partner universities in 2022-23.
- Over 30 IIT Kanpur students were accepted for internships at foreign universities.

DEAN OF RESOURCES AND ALUMNI

Out of the total amount of Rs. 282.00 crore pledged by donors in the last financial year, a total of Rs. 183.12 crore has been received in FY 2022-23, as compared to Rs. 114.06 crore received in the last financial year, and the balance is expected to be received based on the milestones achieved as set by the donors in the next one year.

S.No.	**Some Notable Contributions**	**Pledged** Amount In Rs. (Crore)	**Received till 31st March 2023** Amount In Rs. (Crore)
1.	Gangwal School of Medical Sciences and Technology	285.56	164.56
2.	Centre for Energy Policy and Climate Solutions	18.25	14.97
3.	Mehta Family Centre for Engineering in Medicine	17.50	7.71
4.	The Pawan Tewari Goldman Sachs Sustainability Faculty Chair/The Pawan Tewari Goldman Sachs Scholarships	7.12	2.71
5.	Rajiv and Ritu Batra New Faculty Fellowship, Rajiv and Ritu Batra Endowed Chair for Cybersecurity and Rajiv and Ritu Batra Student Award in Cybersecurity	2.25	2.25
6.	Professor T.R. Viswanathan	2.15	2.15

	Endowment Fund		
7.	IIT Kanpur Development Foundation	2.14	2.14
8.	Rooma & Ajay Dubey Healthcare Innovation and Ideation Program	2.05	2.05
9.	BIS Standardization Chair	1.25	1.25
10.	Sonu Agrawal Memorial Chair	1.25	1.25
11.	Class of 1970 Initiative Gym Expansion & Upgrade	1.08	1.08
12.	Department of Chemical Engineering Modernization of the Unit Operations Laboratory (UOL) and the Workshop Facility	0.78	0.78
13.	Biochar Project	0.48	0.48
14.	Shraman Foundation Scholarship	0.48	0.48
15.	Madan Mohan Singhal memorial scholarship	0.27	0.27
16.	Shri Ram Sahai Agarwal Scholarship, Smt. Vidyawati Agarwal Scholarship and Smt. Tara Ghate's Scholarship	0.26	0.26
17.	Satish and Kamlesh Agarwal CSE Student Scholarship	0.26	0.26
18.	Shri Trilok Chandra Memorial Scholarship	0.25	0.25
19.	Pritam Lal Shakuntala Rawal Memorial Scholar-	0.15	0.15

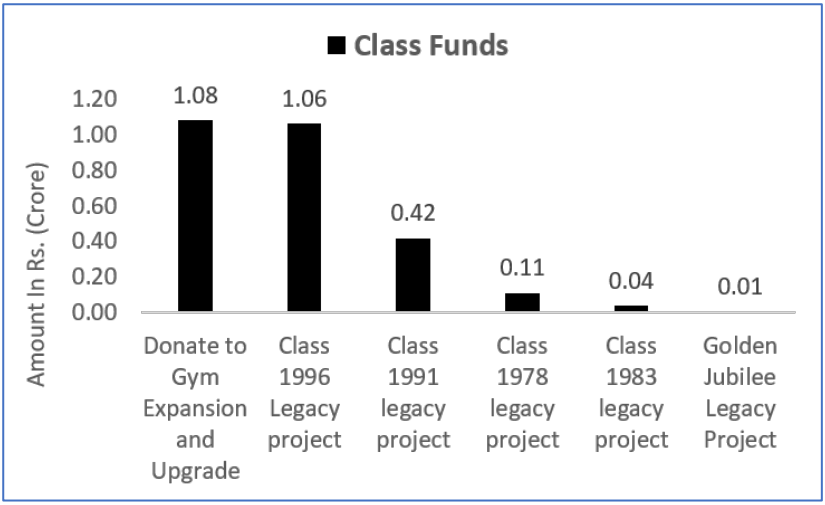
	ship		
20.	Smt. Saroja Krishnan Scholarship	0.13	0.13
21.	Raghvendu Shukla Memorial Merit Award	0.12	0.12

Campaigns

Various campaigns in the year 2022-23 were run by IIT Kanpur to raise funds for different initiatives from time to time.

S.No	Campaign Name (Student/Faculty & Community welfare)	Amount In Rs. (Crore)
1.	Professor T.R. Viswanathan Endowment Fund	2.15
2.	Annual Gift Program	1.53
3.	Sonu Agrawal Memorial Chair	1.25
4.	Class of 1970 Initiative Gym Expansion & Upgrade	1.08
5.	Professor N. Sathyamurthy Endowment Lecture Series	0.13

Alumni across various Classes have contributed for academic and non-academic initiatives for the benefit of students and IITK community.



Major Donations received towards Endowment Activities in FY 2022-23

S.No.	Faculty Chairs	Amount In Rs. (Crore)
1.	The Pawan Tewari Goldman Sachs Sustainability Faculty Chair	2.41
2.	Rajiv and Ritu Batra Endowed Chair for Cybersecurity	2.25
3.	Professor T. R. Viswanathan Chair	2.15
4.	Sonu Agrawal Memorial Chair	1.25
5.	BIS Standardization Chair	1.25

S. No.	Award	Amount In Rs. (Crore)
1.	Raghvendu Shukla Memorial Merit Award	0.12

S. No.	Scholarships	Amount In Rs. (Crore)
1	Shraman Foundation Scholarship	0.41
2	Madan Mohan Singhal memorial scholarship	0.27
3	Shri Ram Sahai Agarwal Scholarship, Smt. Vidyawati Agarwal Scholarship and Smt. Tara Ghate's Scholarship	0.26
4	Shri Trilok Chandra Memorial Scholarship	0.25
5	AlphaGrep Scholarship	0.25
6	Satish and Kamlesh Agarwal CSE Student Scholarship	0.18
7	Pritam Lal Shakuntala Rawal Memorial Scholarship	0.15
8	Smt. Saroja Krishnan Scholarship	0.13
9	Kashinath Jagdish Prashad Shakuntala Mittal Memorial Scholarship	0.02

Major Activities (money received till 31st Mar, 2023)

S. No.	Major Activities	Amount In Rs. (Crore)
1.	Gangwal School of Medical Sciences and Technology	164.56
2.	Centre for Energy Policy and Climate Solutions	14.97
3.	Mehta Family Centre for Engineering in Medicine	7.71
4.	Rajiv and Ritu Batra New Faculty Fellowship, Rajiv and Ritu Batra Endowed Chair for Cybersecurity and Rajiv and Ritu Batra Student Award in Cybersecurity	2.25
5.	Rooma & Ajay Dubey Healthcare Innovation and Ideation Program	2.05

Major Donors (FY 2022-23)

S. No.	Name of Donors	Association with IIT Kanpur	Amount In Rs. (Crore)
1	Rakesh Gangwal	BT/ME/1975	68.78
2	Dev Joneja	BT/ME/1984	6.93
3	Hemant Jalan	BT/CHE/1977	6.00
4	Anil Bansal	BT/ME/1977	4.46
5	Muktesh Pant	BT/CHE/1976	4.08
6	Sudhakar Kesavan	BT/CHE/1976	4.07
7	The Mehta Family Foundation		3.28
8	Deepak Mohan Narula	BT/EE/1985	2.45

9	Rajiv Batra	BT/EE/1982	2.26
10	Ajay Dubey	BT/CHE/1980	2.05
11	Pawan Tewari	BT/EE/1988	1.96
12	Bureau of Indian Standards		1.25
13	Ranodeb Roy	BT/CSE/1990	1.02
14	Jagjeet S. Bindra	BT/CHE/1969	0.93
15	Rathin Datta	BT/CHE/1970	0.49
16	ONE Media 3.0 LLC		0.39
17	Jayadev Misra	BT/EE/1969	0.37
18	Sudhir Mohan Mittal	BT/CHE/1970	0.35
19	Alok Agarwal	BT/EE/1979	0.26
20	Vaishali Agarwal		0.24
21	Uday Mahagaokar	BT/CHE/1970	0.22
22	Mukesh Singh	BT/CSE/1997	0.22
23	Shraman Foundation		0.20
24	Satish Agarwal		0.18
25	Gokul Rajaram	BT/CSE/1995	0.16
26	Arish Ali	BT/EE/1996	0.16

Gangwal School of Medical Sciences and Technology received following donations till 31st March 2023.

Donor Name	Association with IITK	Pledged Amount USD (Crore)	Pledged Amount Rs. (Crore)	Received Amount Rs. (Crore)	Purpose
Muktesh Pant	BT/CHE/1976	0.25	18.62	15.20	Gangwal School of Medical Sciences and Technology
Dev Joneja	BT/ME/1984	0.25	18.62	12.98	Gangwal School of

					Medical Sciences and Technology
Anil Bansal	BT/MSE/1977	0.25	18.62	4.46	Gangwal School of Medical Sciences and Technology
Rakesh Gangwal	BT/ME/1975	1.35	100.00	76.33	Gangwal School of Medical Sciences and Technology
J K Cement Ltd. (Late Mr. Yadupati Singhania)	BT/CE/1977		60.00	15.00	Yadupati Singhania Super Specialty Hospital at IIT Kanpur
IBM India	Organization		37.00	22.50	Gangwal School of Medical Sciences and Technology
REC Ltd.	Organization		14.40	6.64	Gangwal School of Medical Sciences and Technology
Hemant Jalan	BT/CHE/1977		18.30	9.00	Gangwal School of Medical Sciences and Technology
Deepak Mohan Narula	BT/EE/1985		2.45	2.45	Gangwal School of Medical Sciences and Technology
Total:		**2.1**	**288.01**	**164.56**	

CSR Initiatives (FY 2022-23)

S.No	Name of Company	Amount In Rs. (Crore)
1.	Citibank N.A.	22.97
2.	IBM India Pvt. Ltd.	13.50
3.	J K Cement Ltd.	10.00
4.	REC Foundation	6.79
5.	Portescap India Pvt. Ltd.	1.18
6.	AIA Engineering Ltd.	1.00
7.	Ericsson India Pvt. Ltd.	0.90
8.	TCS Fellowship	0.56
9.	Suraj Logistix Pvt. Ltd.	0.51
10.	Vertiv Energy Pvt. Ltd.	0.42
11.	Cookson India Pvt. Ltd.	0.40
12.	PFC Consulting Limited	0.31
13.	LIC Housing Finance Ltd.	0.31
14.	Power Finance Corporation Limited	0.29
15.	AlphaGrep Securities Pvt Ltd.	0.25
16.	National Highways & Infrastructure Development Corporation Limited	0.25
17.	Integra Micro Systems Pvt. Ltd.	0.20
18.	Noccarc Robotics Private Limited	0.16
19.	Vacmet Foundation	0.16
20.	Ganesha Ecosphere Ltd.	0.14
21.	Bright 4 Wheel Sales Private Limited	0.12
22.	ANSYS Software Private Limited	0.12
23.	Frontier Alloy Steel Ltd	0.10

24.	Kewal Engineering Private Limited	0.09
25.	Power System Operation Corporation	0.08
26.	EcoEnergy Insights Limited	0.07
27.	Rahman Industries Ltd.	0.06
28.	Metal Cans and Closures Private Limited	0.05
29.	PNC Infratech Ltd.	0.05
30.	TA Foundation	0.05
31.	Faiveley Transport Rail Technologies India Pvt. Ltd.	0.02
32.	Envirad Projects Pvt. Ltd.	0.01
	Total	**61.13**

Alumni Impact

Our alumni have been the proud recipients of various honours and awards in various categories during FY 2022- 23 as listed herewith:

Category of Award	**Number of Awards**
Academic Awards	05
Industrial Awards	Zero
Government Awards	01

Some of the major achievements of our alumni are:

S.No.	Award	Name of Alumni	Award Endowed by
1.	Padma Bhushan	Professor Deepak Dhar (MSC2/PHY/1973)	Govt. of India
2.	Indian National Academy of Engineering	Professor Monica Katiyar (BT/MME1987)	Indian National Academy of Engineering
3.	Indian National Academy of Engineering	Professor Jayant K. Singh (BT/CHE/1997)	Indian National Academy of Engineering
4.	Indian National Academy of Engineering	Professor Nitin Saxena (BT/PhD/CSE/2002/2007)	Indian National Academy of Engineering
5.	Szent-Györgyi Prize	Dr. Rakesh K. Jain (BT/CHE/1972)	National Foundation for Cancer Research
6.	Subrahmanyan Chandrashekhar Prize	Professor Arnab Rai Choudhuri (MSC2/PHY/1980)	The Division of Plasma Physics
7.	2022 Okawa Research Grant	Dr. Deepak Pathak (BT/CSE/2014)	The Okawa Foundation
8.	2022 IEEE Electron Devices Society Early Career Award	Dr. Girish Pahwa (Phd/EE/2020)	Institute of Electrical & Electronics Engineers

Some Notable Professional Achievements by our Alumni:

S.No.	Name of Alumni	Position
1.	Mr. Raj Kumar (BT/EE/1986)	Chief Secretary of Gujarat
2.	Dr. Ajay Kumar (BT/EE/1984)	IITK Distinguished Visiting Professor
3.	Dr. Smita Hashim (BT/EE/1986)	Zoom, Chief Product Officer
4.	Mr. Anup Bagchi (MT/CHE/1990)	MD & CEO of ICICI Prudential Life Insurance
5.	Mr. Krithi Krithivasan (MT/IME/1987)	MD & CEO of Tata Consultancy Services Ltd.
6.	Mr. Pankaj Gupta (BT/EE/1994)	MD & CEO of Pramerica Life Insurance
7.	Mr. Saurabh Tripathi (BT/EE/1996)	Leader, Global Financial Institutions Practice at Boston Consulting Group, Mumbai
8.	Professor Jayathi Murthy (BT/ME/1979)	President of the Oregon State University, USA
9.	Dr. Arvind Krishna (BT/EE/1985)	Elected to the Board of Directors of Federal Reserve Bank of New York
10.	Shri Pradeep Goyal (BT/MME/1978)	Elected the Senior VP of ASM International
11.	Mr. Shubham Gupta (BT/ME/2014)	Forbes Asia 30 Under 30, Healthcare & Science
12.	Mr. Bhanu Pratap Singh Tanwar (BT/EE/2014)	Forbes Asia 30 Under 30, Consumer Technology
13.	Mr. Rahul Kumar (BT/EE/2014)	Forbes Asia 30 Under 30, Healthcare & Science
14.	Mr. Vivek Jaiswal	Forbes Asia 30 Under 30,

	(BT/EE/2015)	Healthcare & Science
15.	Mr. Vikram Singh Meena (BT/CHE/2016)	Forbes Asia 30 Under 30, Industry, Manufacturing & Engineering
16.	Mr. Hardik Bansal (BT/CSE/2016)	Forbes Asia 30 Under 30, Consumer Technology
17.	Mr. Ravish Agrawal (BT/MSE/2016)	Forbes Asia 30 Under 30, Consumer Technology
18.	Mr. Harshvardhan Chhangani (BT/EE/2016)	Forbes Asia 30 Under 30, Consumer Technology
19.	Mr. Anil Bansal (BT/MME/1977)	The South Asian Times Person of the Year 2022.

Notable entrepreneurial endeavours by some of our alumni:

S. No.	Name of the Alumnus	Startup
1.	Suyash Sinha (BT/CSE/1998)	Garudaire Private Limited deals in the business of UAV Security. Their flagship Varun is a smart surveillance and interceptor drone capable of multimodal sensing and deep learning event analysis of cyber and physical events to provide a deep situational awareness. It is also capable of taking a few key actions to thwart such attacks.
2.	Sarvagy Shukl (BT-MT/AE/2009)	SkyAI is developing ANTI-DRONE SOLUTIONS to counter the threats posed by UAV's and drones. SkyAI is develop-

		ing AI based object detection models for detecting the air-borne drones using high resolution visual and IR cameras. SkyAI solution is an end-to-end solution that will detect, localize, and eventually neutralize the target drones.

Awards to the Alumni by the Institute on Foundation Day

Institute celebrated its foundation day on 2nd November 2022. Every year on this day, IIT Kanpur recognizes the accomplishments of its alumni and confers them with the Institute Fellows, Distinguished Alumnus, Distinguished Services, Young Alumnus and Satyendra K. Dubey Memorial awards. BOG Chairperson Dr. K. Radhakrishnan presided over the function and Shri S. Ramadorai, former CEO & MD of Tata Consultancy Services Ltd. was the Chief Guest.

Institute Fellow 2022

S. No.	Name	Association with IIT Kanpur	Current position
1.	Professor H.C. Verma	(MSC2/PhD/PHY/1978/1980)	Former IIT Kanpur faculty, Physics Dept.
2.	Professor S.C. Srivastava	Former faculty, Electrical Engineering	Director of the IIT Kanpur-La Trobe University Research Academy and Distinguished Visiting Professor at IIT Kanpur

Distinguished Alumnus Award 2022

S.No.	Name	Association with IIT Kanpur	Current Position
1.	Mr. Rajendra Bhattarai	BT/CE/1976	President, Clean Water Strategies, University of Texas, Austin, USA
2.	Mr. Ranodeb Roy	BT/CSE/1990	Co-founder, CEO & Chief Investment Officer, RV Capital Management, Singapore
3.	Professor Sanjay Ranka	BT/CSE/1985	Distinguished Professor, Dept. of Computer & Information Science

			& Engineering, University of Florida, USA
4.	Mr. Aloke Bajpai	BT/EE/2001	Co-founder & Group CEO, ixigo
5.	Mr. Deepak Dev Raj	BT/EE/1970	Founder & MD, Raj Associates, New Jersey, USA
6.	Professor Ratnesh Kumar	BT/EE/1987	Palmer Professor, Electrical & Computer Engineering Dept., Iowa State University, USA
7.	Dr. Ruchir Puri	MT/EE/1990	Chief Scientist, IBM Research, New York, USA
8.	Professor Vivek Sarkar	BT/EE/1981	Chair, School of Computer Science, Stephen Fleming Chair for Telecommunications, College of Computing, Georgia Institute of Technology, USA
9.	Dr. Smita Hashim	BT/EE/1986	Vice-President, Microsoft, USA
10.	Dr. Anil Rajvanshi	BT/MT/ME/1972/1974	Director, trustee & Hon. Secretary, Nimbkar Institute, Maharashtra
11.	Professor Deepak Dhar	MSC2/PHY/1973	Distinguished Professor, IISER, Pune

Distinguished Services Award 2022

S.No.	Name	Affiliation with IIT Kanpur	Current Designation
1.	Mr. Srikant Sastri	BT/CHE/1983	President, TiE, Delhi/NCR
2.	Mr. Rajiv Swarup	BT/EE/1973	Founding President (Retd.), Shiv Nadar University

Young Alumnus Award 2022

S.No.	Name	Affiliation with IIT Kanpur	Current Designation
1.	Dr. Mohit Kumar Jolly	BT/MT/BSBE/2010/2012	Assistant Professor, Centre for Biosystems Science & Engineering, IISC, Bangalore
2.	Dr. Deepak Pathak	BT/CSE/2014	Assistant Professor, School of Computer Science, Carnegie Mellon University, USA

Satyendra K. Dubey Memorial Award 2022

S.No.	Name	Affiliation with IIT Kanpur	Current Designation
1.	Ms. Neha Verma	BT/CHE/1998	Director, energy & Environmental Management Division, Ministry of Steel, Govt. of India

Alumni engagement is a crucial aspect of fostering lifelong connections, strengthening institutional support, and promoting IIT Kanpur's branding. Following are the initiatives undertaken by the institute in FY 2022-23

US IITKarvaan:

Our alumni are our greatest strength. Uniquely placed to help their alma mater, their inputs can guide us on the path to excellence. In view of this, having a continuous dialogue and exchange of views with the alumni is of priority for the overall growth of the Institute. To facilitate the continuous dialogue with the vast alumni based in the United States of America, IIT Kanpur delegation 'IITKarvan' visited USA in May 2022 and held US roadshow networking events in four major cities, namely New York, Washington DC, Chicago, and San Francisco. The events were attended by about 600+ alumni.

In addition to alumni networking events, IITKarvan also visited some of the US universities. Namely,

- NYU Tandon School of Engineering & NYU Langone Medical - Grossman School of Medicine,
- Georgia Institute of Technology,
- Johns Hopkins University,
- University of Illinois, Urbana-Champaign,
- State University of New York – Buffalo, and
- University of California Santa Cruz.
- Fruitful dialogues were initiated to strengthen existing academic and research partnerships as well as to form new partnerships.

- A multi-institute agreement (IITK, IITB, IITD, IITJ and Ashoka University) was also signed for faculty and student exchange with University at Buffalo, the SUNY - The State University of New York.

IITKarvaan Australia

IIT Kanpur held Alumni Networking dinner in Melbourne and Sydney, Australia on 15th & 17th March 2023 to foster and strengthen alumni-institute relations. The events were attended by more than 100 alumni, and it gave them an opportunity to network and chart out the future roadmap of IIT Kanpur.

The alumni engagement activities carried out by IIT Kanpur in 2022-23 successfully fostered a strong sense of community, enabled valuable networking opportunities, and enhanced the institute's image. These initiatives played a crucial role in strengthening the bond between alumni and IIT Kanpur, resulting in increased support, engagement, and philanthropic contributions.

Reunions (Nov 2022 – Mar 2023)

Reunions are the most awaited alumni engagement events of the institute. Held on campus two years after the pandemic, IIT Kanpur witnessed an overwhelming response and participation from its alumni. The institute successfully held 15 reunions that saw the reunion of the Class of 2010, the youngest class to celebrate its 10th reunion, and the Class of 1968, the Frontier batch to celebrate its 55th reunion. These reunions served as a significant platform to reconnect, reminisce, and strengthen the bonds with IIT Kanpur, thereby fostering life-

long connections and supporting the growth of the institute. Milestones such as 10th, 20th, 25th, 30th, 25th, 40th, 45th, 50th, and 55th reunions, provided opportunities for classmates to reconnect, share memories, and celebrate their achievements. They offered an opportunity for IIT Kanpur to share its achievements, advancements, and future plans with its alumni. It also gave an opportunity to our alumni to get involved with the various activities, such as fundraising campaigns, mentorship programs, and other initiatives of the institute. IIT Kanpur held various activities and events to engage its alumni during the reunions, such as gala dinners, networking sessions, panel discussions, and campus tours. Reunions have a significant impact on the growth of IITK as they help build stronger alumni relations, opportunity of knowledge sharing and collaboration along with active involvement in fundraising and campaigns.

Alumni Day

In a one of its kind initiatives, IIT Kanpur held its the first Alumni Day on 25th Dec. 2022. The institute saw the enthusiastic participation of 150+ alumni from across India and abroad. It was nostalgic as alumni from different batches (junior, seniors & batch mates) interacted with each other and recollected fond memories of their Alma mater.

INSTITUTE FACULTY

Recruitment

In the past one year, the Institute has offered 45 faculty positions against a rigorous selection from 927 applicants 58 new faculty members have joined the Institute. These joining also include candidates selected during the previous round of selections held in the academic year 2021-22. The appointments per department are mentioned below:

Department	Number of new faculty
Aerospace Engineering	03
Biological Sciences and Bioengineering	04
Chemical Engineering	02
Chemistry	02
Civil Engineering	02
Computer Science and Engineering	04 (out of this 01 resigned)
Department of Design	01
Earth Sciences	02
Economic Sciences	02
Electrical Engineering	05 (out of this 01 resigned)
Humanities and Social Sciences	01
Industrial and Management Engineering	04
Materials Science and Engineering	02
Mathematics and Statistics	05

Mechanical Engineering	06
Physics	06
Space Science and Astronomy	02
Sustainable Energy Engineering	05

During this period, we have also made 140 offers of post-doctoral fellowships and 37 offers of visiting faculty.

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 Professor Rajat Moona (CSE) has been appointed the new Director of the Indian Institute of Technology Gandhinagar. Professor Dhirendra Katti (BSBE) has been awarded the prestigious TATA Innovation Fellowship by the Department of Biotechnology, Government of India. Professor Ashutosh Sharma (CHE) was selected as the President of the Indian National Science Academy in June 2022. He has also been awarded the “Dr B. P. Godrej lifetime achievement Award” by the Indian Institute of Chemical Engineers (IIChE).

Professor Gautam Biswas (ME) has been awarded the “2023 ASME (American Society of Mechanical Engineers) Heat Transfer Memorial Award” for sustained and outstanding scholarly contributions to thermal science and engineering. Professor Ashok Kumar (BSBE) has been selected for the “Dr. Nandagudi Suryanarayana Rao Academic Award” of the Na-

tional Academy of Medical Sciences (NAMS) for 2023. Professor Jayant K. Singh (CHE) has been awarded the prestigious “NASI (National Academy of Sciences)-Reliance Industries Platinum Jubilee Award” for the year 2022. Professor Shalabh (MTH&S) has been selected for the “Distinguished Statistician Award” of the Indian Society of Probability and Statistics (ISPS) for 2022. Professor Sandeep Verma (CHM) has been awarded the “SMC Gold Medal-2022” by the Society of Materials Chemistry at Bhabha Atomic Research Centre, Mumbai. Professor Avinash K. Agarwal (ME) has received the “WSSET (World Society for Sustainability Energy Technology) Innovation Award-2022” in “Renewable Energy Systems" category.

Professor Yogesh M. Joshi (CHE) has been elected as Fellow of the Indian Academy of Sciences and the Society of Rheology. He along with Professor S. Ganesh (BSBE), Professor Arun Shukla (BSBE) and Professor Javed N Malik (ES) is also elected to the Fellowship of the Indian National Science Academy (INSA). Professor Krishanu Biswas (MSE) has been elected as Fellow of the Royal Society of Chemistry (FRSC). Professor Nitin Saxena (CSE), Professor Santanu K. Mishra (EE), Professor J. Ramkumar (DES), Professor Monica Katiyar (MSE) and Professor Jayant K. Singh (CHE) have been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2022.

STUDENT AWARDS

The prestigious scholarships and awards received by our students have been a matter of pride and pleasure for us. Goutam Das, Antriksh Gupta, Harsh Bihany, Siddhant Suresh Jakhotiya, Antreev Singh Brar, and Mayank Gupta received the Aditya Birla Scholarship. Manan Kalavadia, Rishi Rakesh Agrawal, Srajan Jain, and Divyanshu Narang received the O.P. Jems scholarship. 127 students received the Inspire Scholarship.

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

INSTITUTE COUNSELLING SERVICE

Overview and Team Strength

The Institute Counselling Service (ICS) primarily provides psychological, academic, or financial assistance to students. The ICS aims to bring a human touch in a highly competitive academic environment and lends a helping hand to the students in need, thereby trying to create a home away from home.

ICS consists of a Head, a team of professional counsellors, psychiatrists, a group of student volunteers dedicated to the welfare of the student community and staff members. Currently, there are 6 professional counsellors and 3 psychiatrists who conduct consultations at regular intervals. The student team comprises an undergraduate (UG) wing and a postgraduate (PG) wing. The UG wing has 5 coordinators, 12 core team

members (operations), and 11 core team members (Academics). The UG wing has 221 student guides and 165 academic mentors, whereas the PG wing has 8 core team members, 45 academic mentors, 35 student guides, and 100 orientation team members.

Counsellor and Psychiatrists Sessions

Students typically meet the counsellors in two modes. Either they approach the counsellors on their own volition, or they are referred to the ICS by their friends, faculty members, psychiatrists, or the doctors at the health centre. Students with academic difficulty are also encouraged to meet counsellors to develop strategies to cope with distress. In cases of emergencies, where a student needs urgent psychiatric help, the Counselling Service coordinates with the psychiatrist clinic to ensure the student receives timely and appropriate care. Counselling Service has taken several initiatives in the direction of the well-being of students' mental health like initiating Tele-psychotherapy sessions to aid students during the pandemic which is still in practice.

In the academic year 2022-23, the ICS had a total number of 2781 psychotherapeutic sessions. Out of which 2567 were in-person psychotherapeutic consultations and 214 were Tele-counselling sessions.

Activities:

The team organized various events throughout the year like:

- Open Session with Counsellors to provide a common platform for the students to share their views and talk freely about mental health in the student community.

- A Talk on World NO-Tobacco Day by Professor Prabhat Chand, Psychiatrist, NIMHANS to spread awareness on the physical and psychological implications of substance use.
- A talk on the occasion of World Suicide Prevention Day, to raise awareness about suicide prevention and the importance of mental health. It was conducted by Dr. Kalim Ahmed, a renowned psychiatrist in Kanpur.
- Various inspiring events on the occasion of World Mental Health Day to bring attention to the Mental health wellness. A Mental health awareness open interaction session between the institute counsellors and the campus community was conducted. Here participants shared their thoughts and discussed the importance of mental health in a person's life. The session was followed by a movie screening - "The Perks of Being a Wallflower" and a 5 km Run and Walk event with the theme "Run and Walk for a Cause".
- An event named 'Hakuna Matata' was organized on Diwali. The celebration started with a rangoli competition in collaboration with the Fine Arts Club, and prizes were distributed to the top participants. The day of Diwali ended with students flying Sky Lanterns and decorating the ground with diyas, marking the festival of lights.
- A two-day Gatekeeper training program in association with Suicide Prevention India Foundation (SPIF), Bangalore was facilitated for IITK students, staff, and faculty members. Participants were trained to identify the signs and symptoms related to suicide, methods to ap-

proach and provide initial aid along with referral to mental health professionals for early intervention and support. The event also included an Open Session on mental health.

- A 5 km Run and Walk Event was organized on the occasion of Republic Day. It was based on the theme “Engineering a stronger mind” to promote building mental resilience through physical fitness.
- A talk on “Unlocking the power of clutter-free space” by Gayatri Gandhi, a renowned Kon Mari method consultant was organized. It provided practical tips and techniques on the art of tidying your space and its benefits for mental clarity.
- Several Blogs to raise awareness about mental health issues and suicide prevention were uploaded on social media platforms. A two-part medium blog series on suicidal thoughts was appreciated by many students.
- Social media posts such as Motivation videos for placements and Internship Comic Series were shared with the student community.
- Financial Assistance was also provided through the Students Benevolence Fund (SBF), in the form of scholarships. It was given to those students, who were unable to acquire any other financial assistance from the institute. The SBF scholarship is Rs. 1,500 per month and is given for 9 months. Apart from this, SBF Loans are also available to those who are in dire need of money.

Games and Sports Council

Various events like the Sports Arena, Indoor Arena and PG Orientation were organized by the Council for the incoming Y22 batch. Through these sessions, the council gave essential insights into the bountiful sporting opportunities and the world-class sporting infrastructure present at the disposal of the IITK students.

Workshops

- The council organized a 3-day squash workshop to encourage squash among the female students.
- Dussehra camp, October 1 - 9, 2022, provided a conducive environment for the Inter-IIT teams and coaches to get accustomed to coordination within the team and hence provide a better boost to their final IISM (Inter IIT Sports Meet) preparation.
- A Kabaddi workshop was conducted at the Yoga Hall, New Sports Complex. A professional coach associated with UP Kabaddi Association was invited to train the students on the fundamentals of the sport.

Intra IITK sports events

- A wall-climbing competition open to all students/faculty/staff and their relatives was conducted for the first time at IIT Kanpur.

- IBL (badminton league) was a team event conducted by the Council with the mandatory format of a team of 4 boys and 1 girl.
- Institute Phatta League was a thrilling event organized by the Council that filled everyone with a wave of enthusiasm and excitement.
- The Panenka, a Football Penalty Shoot Tournament saw a huge turnout, with 24 teams of 5 to 7 players each.
- Enthusia Volleyball League was a tournament organized exclusively for the PG student community of IIT Kanpur.
- Institute volleyball league was conducted in a league format and was conducted for both the men and women category.
- The Institute Cricket Team organized its first-ever Institute Cricket Championship (ICC) for all batches, including UGs and PGs.
- Institute Panja League was conducted for various weight categories for both men and women.

The winners were awarded certificates, medals, and trophies.

Felicitation

- "Graduating Batch Sports Appreciation and Felicitation Ceremony" was organized by the Council on 30th June 2022 to acknowledge the contribution of the senior contingent members towards IITK Sports.

As a mark of love and respect for the beloved coaches, the council members organized the Teachers' Day Celebrations.

UDGHOSH 2022

The Council played an integral part in the successful conduct of Udghosh by ensuring a flawless arrangement of the event's logistics. The Council made a dedicated effort to ensure that Udghosh stood tall on everybody's expectations. The event served as a great source of rejuvenation and recreation for the campus community. The official contingent jersey was released on 11th October.

Inter IIT Aquatics Meet

The meet was held from 4th-9th October at IIT Delhi. The IITK team performed creditably and managed to secure multiple medals in the variety of events held, hence bringing up the tally to close in at Silver for the Women's Swimming team and 4th place for the Men's Swimming team.

Inter IIT Sports Meet 2022

The IITK contingent continued their stellar record in sports such as volleyball (women) gold, table tennis (women) bronze, athletics (men) bronze, aquatics (men) 4th, and aquatics (women) silver by grabbing medals and presenting an excellent show of sportsmanship.

INFERNO 2022

The Council organized INFERNO (The Sporting Event of the General Championship) for the campus community to revive the sporting rivalry among all the halls of residence. A total of 16 games and sports were incorporated in INFERNO this year, ranging from Volleyball, Hockey, Powerlifting, Tug of War, etc. The official Logo was also designed and revealed for the first time. Freshers' inferno was organized from 6th-8th January exclusively for the Y22 batch. The event was organized in 11 different sports for the men's category and 9 sports for the women's category.

Screenings

The Live Screening of 'F1 Australian Grand Prix', UEFA Champions League final and IPL '22 final was a huge success which brought the student community together through love of sports.

Media and Cultural Council

Cultural Extravaganza

Various events like Dance Extravaganza, Musical Extravaganza, Dramatics Eve, Humor Hour etc. were organized over the weekend from 13th-17th April 2022 by different clubs.

Treasure Hunt' 22

The Council organized a Treasure Hunt for the Y21 batch on 17th June and for the Y22 batch on 24th December. The events had two stages: The Scavenger Hunt and The Treasure Hunt. Each of the events witnessed the participation from 700+ students.

Mafia Night

It was organized for the Y21 batch on 5th August. The event was a huge success with a large participation.

ALFAAZ

The Council, in association with Shivani Centre, hosted the first Literary Festival, Alfaaz. The event was held over 3 days, starting from 9th September.

Yaanam Movie Screening

As part of the Azadi Ka Amrit Mahotsav event, the Council organized the first-ever science documentary screening in the Sanskrit language, Yaanam, which recounts the unique and challenging aspects of the Mangal Mission. Mr. Vinod Mankara (Director of the movie) also visited IITK at the time of screening.

CHEF IT UP

The first ever culinary event was conducted for the campus junta. It attracted a huge participation and helped in preparation for Inter IIT Cult Meet 5.0.

Participation Visits

- Inter IIT: After a gap of two years, Inter IIT CULT MEET 5.0 was held at IIT Madras, and a 230+ member IITK contingent participated with the utmost enthusiasm.
- Thomso: IITK contingent participated in Thomso, the annual cultural festival of IIT Roorkee.

Freshers Weekend

The Freshers' weekend was organized from 9th-11th December 2022. It started with a bang with the Freshers' Night, played through with the music with the DJ Night and was concluded with a touch of serenity and relaxation with a movie night.

THC House party

This is a one-of-a-kind cultural event aimed at bringing the best of hip-hop to the campus - inviting performances from reputed hip-hop artists all over the country.

GALAXY

The 38th edition of Galaxy, the annual Inter-pool Media and Cultural Competition, was organized successfully from 30th March to 9th April 2023. The event brought together students from various pools, who displayed their talents and competed in a variety of events, fostering an atmosphere of enthusiasm and camaraderie.

Science and Technology Council

Team Recruitments

- Summer project recruitment for the Y21 batch took place in the month of May.
- Team recruitment was conducted for the Y22 batch in March-end. Approximately 110 Y22s were inducted as Junior members.

Makerspace Initiative

The Council proposed an initiative for building MakerSpace, which is aimed at providing a common workspace for various teams and entities of the Council. The Class of 1991 has committed a sum of Rs. 2.2 crore for the MakerSpace initiative, out of which a sum of approximately Rs. 90 lakhs have already been raised.

SnT Summer Camp 2022

The Council successfully conducted the SnT Summer Camp 2022 during May - August. A total of 2033 students applied for the SnT Summer Projects, out of which 943 students were ratified finally across a total of 52 projects spanning across 12 entities in the Council.

SnT PAVILLION

The Council organized the SnT Pavillion, where freshers were acquainted with the activities of all the entities of the SnT Council. The event was organized in a completely offline mode for the UG Y22 batch after a period of 3 years spanning over 4 days.

KPIT SPARKLE HACKATHON

The SnT Council organized a guest talk on 27th September 2022 aimed to introduce the campus community to the esteemed KPIT Sparkle Hackathon. The lecture was delivered by Mr. Sant Ranjan, who currently serves as the Principal System Architect and the CTO of KPIT Technologies Pvt. Ltd.

Performance In Inter IIT Tech Meet 11.0

IIT Kanpur secured the 3rd position in the 11th Inter IIT Tech Meet conducted in hybrid mode. This year, the Tech Meet was hosted by IIT Kanpur. IIT Kanpur bagged 3 Gold medals, 2 Silver medals, and 5 Bronze medals in the Tech Meet this year.

TAKNEEK

Takneek was conducted for the first time in 3 years, in fully offline mode in the month of April over a period of 10 days.

Problem statements:

- Aakash: PSes with 5-7 days of preparation.
- Vayu: PSes with 2-4 days of preparation.
- Jal: On-the-spot PSes.
- Agni: Our flagship event, SnT Code.

Academics and Career Council

The UG Academics Wing helped the freshers to kick start their academic journey through the academic orientation, mentor assignment, department guide booklets, comprehensive course guidance (CCG) kits, AnC booklet, project reviews

through the Instagram page, etc. The Wing also conducted a MATLAB workshop, which covered various topics like introduction to MATLAB, overview of curve-fitting, introduction to machine learning with MATLAB, building apps with MATLAB, introduction to image processing and deep learning.

The PG Academics Wing conducted a PG Academic orientation to familiarize the students to an unknown campus environment, its faculties and infrastructure. The wing also hosted an informative talk session about the "Prime Minister Research Fellowship Scheme (PMRF)" for PhD students. The speakers from different disciplines were Mr. Varad Jayant Daoo, Mr. Vikas Tiwari, Ms. Bhavana Dwivedi, and Mr. Pratik Samal, who are PMRF fellows themselves. They shared their experiences and insights about the scheme, which was valuable for the attendees.

The Career Development Wing: The activities of the wing are:

- Internship Sessions were conducted to spread awareness about the preparation and preparation resources for the internship season, aimed at the Y19 batch.
- A Group Discussion Marathon event broken up into a number of different sessions took place in the month of July.
- AnC Discussion Forum is a virtual platform designed to assist students in engaging in academic debates relating to their future careers.
- The seniors showed great enthusiasm to help their juniors through the Intern Mentorship Program. 70+ mentors were matched to the students from different pro-

files and experiences based on the preferences filled by the mentees.

- A Resume Making Session was organized to help students create an effective resume and navigate the placement season with confidence.
- Data Structure and Algorithm course was conducted along with the Mock Tests and Mock Interviews. Programming Pathshala, a social enterprise helping students learn to code and become industry-ready, collaborated for this event.
- Mr. Animesh Mishra (Y15 batch), a Venture Capitalist at Eximius Ventures, and Adarsh Srivastava, Co-Founder at ZK Labs gave a talk on Off-campus Opportunities.
- A session was conducted on Internship Programs for Women was aimed to provide an overview of various mentorship and sponsorship programs available for women in the tech industry. Speakers at the event were Ms. Akanksha Singh, Ms. Avishi Taneja, Ms. Gitika Mittal, and Ms. Sweta Kumari of Y20 Batch.
- Placement Preparation session conducted with Cantilever Labs was aimed to train graduate students in Software, Quant, Data Science, Finance, Consulting, and Product Management profiles, along with GD, case, and interview preparation.
- Placement Buddy Talks for PG Students had been instrumental in helping PG students gain valuable insights into the job market and build their professional network.

- Career Connect was organized from 10th-12th February 2023. This annual flagship event aimed to encourage undergraduate and postgraduate students to explore and equip themselves to make informed and wise choices in their professional, social, and personal endeavors.
- Passion To Profession was a featured panel discussion with two of our distinguished alumni, Mr. Abhishek Dhandharia, a filmmaker and director of the popular web series "Physics Wallah," and Mr. Samarth Bansal, a journalist who has worked in journals like The Hindu, Hindustan Times, and The Wall Street Journal.
- At an informal talk session, Alumni Connect with two Y76 alumni, Mr. Sandeep Tiwari, and Mr. Suresh K. Lodha provided great insights into the prospects of academic and industrial opportunities in the US.
- Mastering Money was a special session on personal finance specifically tailored to college students.
- The session Women in Tech was held on 12th February to highlight women's rise in technology and engineering. Our guest speakers for the session were Ms. Anu Meena Malhotra, founder of Agrowave, Forbes 30 under 30 Asia, and Ms. Shefali Vijayawargia, brand manager of Amul, Forbes 30 under 30 India.
- Cracking the Code organized in collaboration with Programming Pathshala aimed to educate attendees on the journey from learning to code to facing programming interviews. The guest speakers were Mr. Anup Garg, co-founder of Programming Pathshala, and Mr. Bharat Khanna, a former employee of Tower Research.

- Bridging the Gap was held on Saturday, 11th February. The session was hosted by Mr. Arijit Bhattacharyya, a seasoned expert with over 24 years of experience in entrepreneurship, technology, finance, education, and innovation.
- The guest speaker at Building Better You was Mr. Divas Gupta, a certified public speaking coach and 3x Tedx speaker.
- At How to Improve Your Research Skills Professor Sundararajan emphasized that carrying out good research involves developing multiple skills simultaneously, such as deep thinking, a questioning mind, and lateral thinking. Additionally, researchers should be fully aware of ethical practices before starting their journey.
- An exclusive online session for senior PhD students was conducted on 25th February 2023 on Postdoctoral Fellowship Opportunities. The speaker for the interactive session entitled "Find your way in the world of postdoc research" was Dr. Akash Choudhary, a Humboldt postdoc fellow at the Institute of Theoretical Physics, Technische Universität (TU) Berlin.

Research Wing

Institute Research Symposium 2023

The Council celebrated the research work of the institute with featured talks by Professor Shalabh and Professor Siddharth Panda, the Deans of Academic Affairs and Student Affairs, respectively. The event was graced by the presence of Chief

Guest Professor Abhay Karandikar, Director of IIT Kanpur, and was organized by Professor Nisanth N. Nair as the organizing chair along with Professor Ark Verma as the faculty advisor of the Academic and Career Council. Other members of the organizing team included Professor Ashoke De, the Associate Dean of Academic Affairs, Mr. Shreyank Goel, the general secretary of PG AnC, and Mr. Manit Ajmera, the general secretary of UG AnC. Several professors from different departments of the institute also presented their work during the event.

5TH National Students' Research Convention

The Convention on Healthcare and MedTech was held from 3rd-5th March at IIT Kanpur. The convention was organized in collaboration with the Gangwal School of Medical Sciences and Technology and the Indian Council of Medical Research. Over 140 participants took part in the convention, making it a truly massive event.

Talks

- An interactive Session on ‘Research in STEM for India’ with Professor Ashutosh Sharma was organized on 4th November 2022.
- On 15th February 2023, the Council organized a talk by Professor Biman Bagchi on the book "Vignettes for Success in Academia."

International Relations Wing

- **SemEX101:** A detailed course on the process of semester exchange and was covered via 3-4 sessions over the weekends to increase the awareness and knowledge of the campus community.
- **Language Learning Groups:** We encouraged to help the campus community discover and interact with people who are proficient or enthusiastic to learn a particular language.
- The Wing assisted in the Duo-India Fellowship Program.
- Foreign Training Program and Alumni Connect was initiated in association with the Research Wing, AnC Council.
- Organization of a get-together and orientation for foreign students in collaboration with the office of international relations. The Wing briefed them about the academic structure at IIT Kanpur and the facilities on campus.
- Allocation of a point of contact (representatives from the academics and career council) to each foreign student to help them with all the needs and provide necessary help and guidance.
- Hosted a delegation from top US institutes, led by Professor Nikhil Gupta from NYU Tandon School of Engineering and Prof Mritunjay Doddamani, under USA- India Summers Program a flagship event of New York University-International Research Experience for Students (NYU-IRES).

- Organized the Diwali celebration event along with the OIR office for the foreign nationals, which included movie screening and traditional diwali rituals to help them understand the Indian culture.
- An Informative Session on DAAD-KOSPIE Scholarship was organized. The speaker was Mr. Raghav Mundra, Ph.D. student in Materials Science and Engineering at IITK. In the session, he discussed the eligibility criteria, grants, funding, and the future of the scholarship program.
- Another informative Session on QUAD Fellowship was organized, where the speaker was Mr. Sharun Kuhar, member of the first cohort of Quad Fellows for 2023.

Entrepreneurship Cell

Campus Hangouts

They are informal and interactive discussion sessions on entrepreneurial matters targeting the campus students. Hangout-1 conducted on 11th June, covered topics like Web3, NFTs, Decentralization, VC investing, etc. Hangout-2 was conducted on 19th June, which saw a participation of 100+ students and an insightful talk by Mr. Nikhil Kurele, Co-founder and CEO, Noccarc.

Pitchers' Venture

The event was conducted on World Entrepreneurs' Day, 21st August. The competition focused upon ideating a solution to a relevant problem and then presenting it in the form of a pitch

before the judges who will further help you in thinking and pitching better.

IIT KANPUR Combinator

It is an ecosystem which brings together students, professors, and alumni of IIT Kanpur from different parts of the startup journey. Here they can help each other grow, connect, and foster entrepreneurship. The event was launched on 2nd October and the first session was held on 29th - 30th October.

UPSTART 2022

It saw an overwhelming response from startups, with over 250+ registrations from in-and-around Bangalore, Hyderabad, and Delhi with great potential to carve the future with their solutions and services. 42 startups got to pitch in front of investors from top-notch Investment firms- Indian Angel Network, IvyCamp, Atal Incubation Centre - CCMB, Chiratae Ventures, Ankur Capital, Orios Venture Partners, IAN Fund, Hyderabad Angels, Blume Ventures, SucSEED Ventures and many more. The final pitching and on spot funding opportunity was concluded at the E-Summit 22, IIT Kanpur.

E-SUMMIT'22 (13th-15th January)

E-Summit, an annual flagship event of IIT Kanpur, was started with the intention of fostering entrepreneurial initiatives and activities on the campus and accomplishing IIT Kanpur's mandate of nurturing India's future technopreneurs. E-Summit' 22 consisted of events like Upstart Finale, Decrypt, Be an Angle, talks, panel discussions, and workshops on a diverse range of topics.

Gymkhana Initiatives & Operations

Gymkhana Day

A Gymkhana Day for the graduating batch of 2022 was organized at the Outreach Auditorium on 30th June 2022. Mementos were given to the students by the Director and a farewell dinner was organized by the Gymkhana.

Inter-IIT Tech Meet 11.0

Inter-IIT Tech Meet 11.0 was hosted by IIT Kanpur on 10th-12th February. The event was successfully conducted. Logistics were handled by forming a three-tier team with President, Students' Gymkhana being the Chief Executive. Funds were utilized as a GFR, part of the President's Office budget.

General Championship 2022-23

The General Championship 2022-23 was organized in a short span of 11 days, with three major events, Galaxy, Takneek & Inferno.

STUDENTS' PLACEMENT OFFICE (SPO)

Campus Recruitment Drive 2022-23

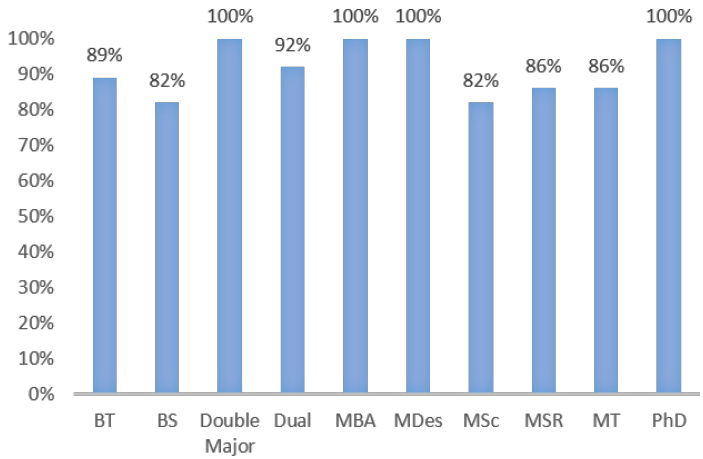
"*One student one job*" policy (single offer acceptance policy) was continued to ensure equal opportunity to all students registered with SPO this year. Recruitment drive for the academic year 2022-23 was held in two phases. The Phase-1 of recruitments officially started on 1st December 2022 and continued till 15th December 2022, though the preparations and shortlisting activities for campus placements started in July. About 300+

recruiters participated to hire students for full time employments. In Phase-1 placement season 2022-23, a total of 59 top-tier firms with 93 different profiles from various sectors conducted interviews on Day 1, an unprecedented 317 job offers were extended, and 287 of those were accepted by IIT Kanpur students. The recruitment drive was conducted in hybrid mode for the internships and campus recruitments. The Phase-2 recruitment started in January 2023 and continued till May 2023.

Based on hiring numbers, the top recruiter for this placement season is Rakuten Mobile which hired 37 students. Other top recruiters of the season are American Express, PwC, Intel, Microsoft India, Qualcomm etc.

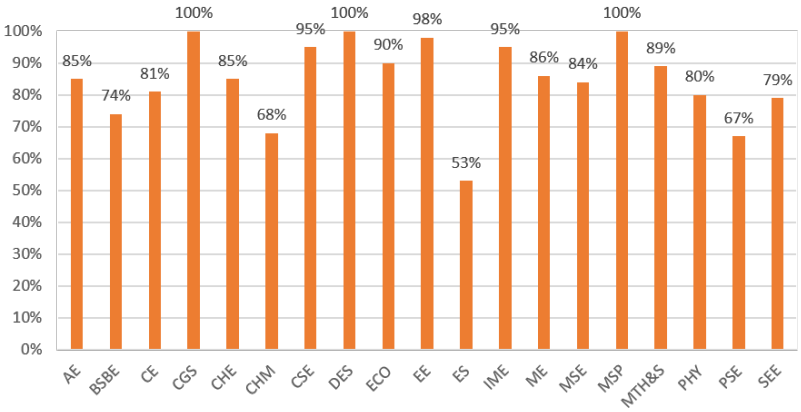
A total of 393 organizations registered in the campus placements. A total of 1215 students out of the 1382 registered students were placed through SPO during the academic year 2022-23. This includes students in both undergraduate and postgraduate courses. This year SPO achieved new heights in number of placements, highest international and domestic package, number of international offers, and number of Pre-Placement Offers (PPOs). More than 60 companies extended 208 PPOs, which is a 33% increase as compared to the last year. So far IITK students have received 81 international offers out of which 73 are accepted. This year's highest domestic package is INR 1.9 crore, and highest international base package is HKD 2250000. The overall placement stood at 87.9%, which commends the dedicated efforts of the entire SPO team including the students, staff, and faculty coordinators.

A summary of program-wise placement record for the current season is shown in the following Figure.



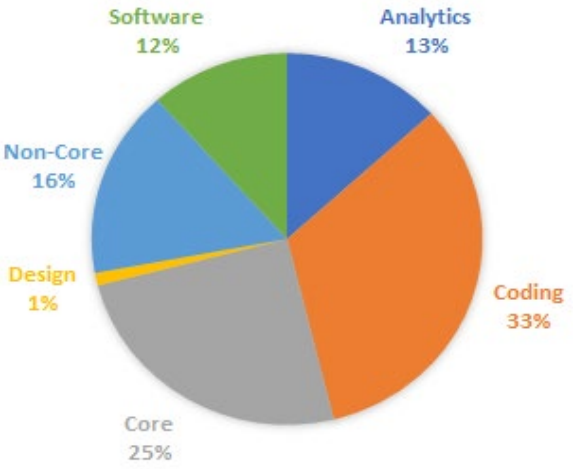
Placement statistics of various degree programs at IIT Kanpur during placement season 2022-23.

Among the various departments, CSE, MSP, IME, EE, DES, ECO, CGS recorded *student placement percentage of above 90%* (The percentage calculations presented above are derived based on the number of graduating students who had registered with the placement office). A good number of graduating students do not register for placements as they are interested in pursuing higher studies or entrepreneurship options. In addition, an appreciable number of IIT Kanpur students pursue Civil Services jobs or take-up career options in public sector companies and, therefore, abstain from participating in the recruitment process. A summary of department wise placement record for the current season is shown in the following Figure.



Department wise placement statistics at IIT Kanpur during placement season 2022-23.

Students of IIT Kanpur continued to demonstrate a strong commitment to their core educational background in their choice of employment. The Placement drive witnessed highest participation from coding and software firms which accounted for 45% of the total placements, whereas 25% of the total placements comprised core firms. Some of the top recruiting firms that visited IIT Kanpur for hiring students in core engineering sectors include Intel, Microsoft India, Oracle India Pvt Ltd, PwC, Qualcomm, Rakuten Mobile, Reliance Industries Limited, SAP Labs, Sprinklr, Texas Instruments etc. This trend observed in the last few years seems to have taken strong roots at IIT Kanpur. A summary of sector wise placement record for AY 2022-23 is shown in the following figure.



Sector wise placement statistics of IIT Kanpur during the placement season 2022-23.

Some of the prominent recruiters who participated in the Campus Recruitment Drive 2022-23 include Air India, American Express, Axtria, CapitalOne, EXL, Intel, J. P Morgan & Chase, Microsoft India, Oracle India Pvt Ltd, PwC, Qualcomm, Rakuten Mobile, Reliance Industries Limited, SAP Labs, Sprinklr, Texas Instruments etc.

New Initiatives:

Samvardhan: This year SPO successfully conducted the first-ever industry-academia connect 'SAMVARDHAN'. Over 15+ companies from various industries, offering an array of activities to help students navigate their career paths, participated in Samvardhan. To provide practical guidance and hands-on experience to the students, leading companies conducted many interactive workshops, panel discussions, keynote speeches and Hackathons. Samvardhan 2023 was not just an opportunity for students to connect with potential employers but also to network with peers from different organisations. The event provided a platform for the students to exchange ideas, learn from each other's experiences, and build their professional networks.

Special Placement Drives for Differently Abled Students: SPO worked closely with different companies and alumni contacts to provide placement and internship opportunities to our differently abled students and were able to achieve 73% placements. With a plan of involving more IITs in this initiative in the future, the joint drive aims to expand the reach and impact of the program, helping to provide more opportunities for such students across the country and to promote greater inclusivity and diversity in the workforce.

Toastmasters International Club: We thank our generous donor Mr. Suresh Bazaj, an IITK Alumnus for his support to start Toastmaster Club at IIT Kanpur. To cater to the needs of the students in the domain of communication and leadership skills, we have started and been successfully running three Toastmaster Clubs. Every weekend the club members conduct meetings. These meetings address skills such as listening, planning, motivating, and team building and give members the

opportunity to practice them. More than 500 students have so far experienced the toastmasters club environment through various workshops conducted with veteran Toastmasters and industry leaders. As of now, 110 students have officially joined the clubs. In the coming year, we will have a few more Toastmaster clubs.

EPILOGUE

Dear students,

On this splendid occasion of fifty-sixth convocation, I want to extend my heartfelt congratulations and admiration to each and every one of you for your impressive achievements. I also want to offer my best wishes to the entire graduating class of 2023. I applaud your remarkable accomplishments, which serve as a testament to your strong commitment to excellence. You have faced challenges head-on, overcome obstacles, and emerged victorious. Your journey at this institution has shaped you into exceptional individuals you are today, and I have no doubt that you will continue to thrive in the future.

It is imperative to bear in mind that your esteemed institution will always be there to support you and provide guidance whenever needed, ensuring your unstoppable march towards success. From now on, you will become an integral member of an elite group of IIT Kanpur alumni, who have achieved great success in various fields. I wish you the best as you embark on the next phase of your journey, and I look forward to hearing about your future accomplishments. Use your knowledge and skills to make a positive impact on humanity and strive to bring a profound transformation in the lives of others.

Our revered institution, poised to become a leading national and international centre of knowledge, will undoubtedly draw

inspiration from your impressive achievements and triumphs in the days to come. It is your duty to give back to, not just to your parents and loved ones, but also to the country that shaped you into the person of valour and distinction that you are today.

The IITs, far beyond being institutions that provide excellent engineering expertise, also serve as crucibles that forge visionary leaders who propel the nation forward. Under your leadership, we hope this nation can reach even greater heights. As you navigate your professional paths, let the principles upheld by your alma mater—integrity, discipline, and excellence—guide every aspect of your life. These principles will steer you in all aspects of your life and empower you to have a positive influence on the world around you. This esteemed institution is progressing towards becoming an exceptional national and international establishment, and your achievements and triumphs in the future have the potential to elevate it even further. Regardless of your location or the role you occupy, always cherish your Alma Mater as the place where it all began and endeavour to extend your support to this institute in every conceivable manner in the years to come. I hope you become true exemplars and ambassadors of this institution. Work diligently to give back to the society and the nation that has nurtured and propelled you to great heights. May this auspicious moment mark the inception of a splendid new chapter in the annals of your lives. "Dare to be free," Swami Vivekananda stated, "dare to go as far as your thought leads and dare to carry that out in your life."

Jai Hind!
Professor Abhay Karandikar

BOOKS PUBLISHED

1. “Basic Electronic Circuits: Problems & Solutions”, K. Vasudevan (EE), Springer (2022), ISBN: 978-3-031-09363-0
2. “BSIM-Bulk MOSFET Model for IC Design- Digital, Analog, RF and High-Voltage”, Harshit Agarwal, Chetan Gupta, Yogesh Singh Chauhan (EE), Chenming Hu, Woodhead Publishing Elsevier (2023), ISBN: 9780323856775
3. “Introduction to Statistics and Data Analysis - With Exercises, Solutions and Applications in R”, Christian Heumann, Michael Schomaker, Shalabh (MTH&S), Springer (2023), ISBN: 978-3-031-11832-6
4. “Hybrid Censoring Know-How: Design and Implementation”, N. Balakrishnan, Erhard Cramer, Debasis Kundu (MTH&S), Academic Press (2023), ISBN: 978-0-12-398387-9
5. “Electron Microscopy in Science and Engineering”, Krishanu Biswas (MSE), Sri Sivakumar, Nilesh P. Gurao (MSE), Springer (2022), ISBN: 9789811651014
6. “High Entropy Materials- Processing Properties and Applications”, Krishanu Biswas (MSE), Nilesh P. Gurao (MSE), Tanmoy Maiti (MSE), Rajiv S. Mishra, Springer-Nature (2022)
7. “Fundamentals of Thermal Spraying”, Ariharan S., Rubia Hassan, Alok Bhadauria, Ashutosh Tiwari, Ritik Tandon, Anup K. Keshri, Kantesh Balani (MSE), CRC Press (2022)
8. “New Horizons in Metallurgy, Materials, and Manufacturing”, A. Arora, A. Shrivastava, C. Srivastava, N. Dhawan, S. S. Singh (MSE), Springer-Nature (2022)
9. “Studies in Quantitative Decision Making”, Ghosh D., Khanra A. (IME), Vanamalla S. V. (IME), Hamid F. (IME), Sengupta R. N. (IME), Springer (2022), ISBN: 978-981-16-5819-8
10. “Implementing Enterprise Cyber Security with Open-Source Software and Standard Architecture: Volume II”, Anand Han-

da, Rohit Negi, S. Venkatesan, Sandeep K. Shukla (CSE), River Publishers (2023), ISBN: ISBN 9788770227957

11. "Analysis of pavement structures (2nd edition)", Animesh Das (CE), CRC Press – Taylor & Francis group (2023), ISBN: 9781032041568

BOOKS EDITED

1. "Logic and its Applications, 10th Indian Conference (ICLA 2023) Proceedings.", Mohua Banerjee (MTH&S), A.V. Sreejith, Springer Nature (2023), 978-3-031-26689-8
2. "Volume 1, Proceedings of 6th Conference of Transportation Research Group of India (6th CTRG) Lecture Notes in Civil Engineering", Lelitha Vanajakshi, Animesh Das (CE), Prasanta Kumar Sahu, and Debasis Basu, Springer (2023), ISBN: 978-981-19-3505-3
3. "Volume 1, Proceedings of 6th Conference of Transportation Research Group of India (5th CTRG) Lecture Notes in Civil Engineering", Dharamveer Singh, Lelitha Vanajakshi, Ashish Verma, Animesh Das (CE), Springer (2023), ISBN: 978-981-16-9921-4
4. "Volume 2, Proceedings of 6th Conference of Transportation Research Group of India (5th CTRG) Lecture Notes in Civil Engineering", Akhilesh Kumar Maurya, Bhargab Maitra, Rajat Rastogi, Animesh Das (CE), Springer (2023), ISBN: 978-981-16-8259-9
5. "Volume 3, Proceedings of 6th Conference of Transportation Research Group of India, Lecture Notes in Civil Engineering", Manoranjan Parida, Avijit Maji, S. Velmurugan, Animesh Das (CE), Springer (2023), ISBN: 978-981-16-9925-2

FELLOWSHIPS

1. Professor Dhirendra Katti (BSBE) has been awarded the TATA Innovation Fellowship by the Department of Biotechnology, Government of India. The fellowship is meant to honour and encour-

age scientists involved in translational research through innovative scientific knowledge and platform technologies.

AWARDS AND HONORS

1. Professor Abhay Karandikar (Director, IIT Kanpur) has been awarded the notable Qualcomm Faculty Award, Qualcomm Technologies, Inc., USA, 2022.
2. Professor Abhay Karandikar (Director, IIT Kanpur) has been awarded the prestigious “Swantanryaveer Savarkar Puraskar 2023”.
3. Professor Gautam Biswas (ME) has been awarded the “2023 ASME (American Society of Mechanical Engineers) Heat Transfer Memorial Award” for sustained and outstanding scholarly contributions to thermal science and engineering.
4. Professor Ashok Kumar (BSBE) has been selected for the “Dr. Nandagudi Suryanarayana Rao Academic Award” of the National Academy of Medical Sciences (NAMS) for 2023 in recognition of his research work in medical sciences.
5. Professor Jayant K. Singh (CHE) has been awarded the prestigious “NASI (National Academy of Sciences)-Reliance Industries Platinum Jubilee Award” for the year 2022, covering both physical and biological sciences. The award is given to an individual researcher for the application-oriented innovations.
6. Professor Dipak Mazumdar (MSE) has been conferred the “Distinguished Alumni Award – 2023” by National Institute of Technology Jamshedpur.
7. Dr. Prashant Bagad's (HSS) marathi novel Naval has won the prestigious “Hari Narayan Apte Award for the best novel of 2021”. This award is given by the Maharashtra Government.
8. Professor. Ashutosh Sharma (CHE) has been awarded the “Dr B. P. Godrej lifetime achievement Award” by the Indian

Institute of Chemical Engineers (IIChE) in its 75th Annual Meeting.

9. Professor. Jayant K. Singh (CHE) has been awarded the Deepak Group's "Padma Bhushan Prof K L. Doraiswamy Chemcon Distinguished Speaker Award" of IIChE.
10. Professor. Arun Shukla (BSBE) has been selected for the "P. S. Sarma Memorial Award, 2022" by the Society of Biological Chemists, India.
11. Dr. Abhishek K. Gupta (EE) has been selected for the "Institution of Engineers India (IEI) Young Engineers Award 2021-2022" in the Electronics & Telecommunication Engineering discipline. The award will be presented during the inaugural session of the 37th National Convention of Electronics & Telecommunication Engineers to be held at Hyderabad.
12. Professor. Shalabh (MTH&S) has been selected for the "Distinguished Statistician Award" of the Indian Society of Probability and Statistics (ISPS) for 2022. The award was given at the conference of ISPS held during 4-6 January 2023.
13. Professor Avinash K. Agarwal (ME) has been chosen for the "Distinguished Alumnus Award-2022" by IIT Delhi.
14. Professor Sandeep Verma (CHM) has been awarded the "SMC Gold Medal-2022" by the Society of Materials Chemistry at Bhabha Atomic Research Center, Mumbai.
15. IIT Kanpur has won the "National Award for e-Governance (Silver Medal)" from the Department of Administrative Reforms & Public Grievances, Ministry of Personnel, Public Grievances & Pensions, Government of India under the category "Outstanding research on Citizen Centric Services by Academic/Research Institution" of the National Awards for e-Governance Scheme 2021-2022. This award is given for the project on analyzing public grievances using AI which was completed for the Ministry of Defence by Professor Shalabh (MTH&S), Dr. Nisheeth Srivastava (CSE) and Dr. Piyush Rai (CSE) of IIT Kanpur.

16. Professor. Avinash K. Agarwal (ME) has received the “WSSET (World Society for Sustainability Energy Technology) Innovation Award-2022” in “Renewable Energy Systems" category.
17. Professor. Basker Sundararaju (CHM) has been selected to receive the “CRSI (Chemical Research Society of India) Bronze Medal” for the year 2022 in recognition of his outstanding contributions in Chemistry.
18. Professor. Sanjay Mittal (AE) has been elected for the “Gopal Das Bhandari Memorial Distinguished Teacher Award” for the year 2022.
19. Dr. Dootika Vats (MTH&S) is elected for the “Sushila and Kantilal Mehta Award” for the year 2022.

APPOINTMENTS

1. Professor. Rajat Moona (CSE) is appointed as the next Director of the Indian Institute of Technology Gandhinagar.

EDITORSHIP / MEMBERSHIP

1. Dr. Piyush Rai (CSE) has been invited to serve on the editorial boards of (i) IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) and (ii) ACM Transactions on Probabilistic Machine Learning (ToPML).
2. Professor Avinash K. Agarwal (ME) has been invited to join the Editorial Board of the SAE International Journal of Engines as an Associate Editor.
3. Professor Avinash K. Agarwal (ME) has been appointed as Associate Editor of the ASME Open Journal of Engineering.
4. Professor Malay Banerjee (MTH&S) has been invited to join the Editorial Board of Applied Mathematical Modelling, a journal from Elsevier.
5. Professor Kumar Ravi Priya (HSS) has been appointed as an Associate Editor of the Qualitative Health Research journal.

6. Professor Yogesh M. Joshi (CHE) has been elected as a Fellow of the Indian Academy of Sciences - 2023.
7. Professor Krishanu Biswas (MSE) has been elected as a Fellow of the Royal Society of Chemistry (FRSC).
8. Professor Jaleel Akhtar (EE) has become a Fellow of IEEE. This is in recognition of his contributions in microwave planar sensors and nano-composites-based microwave absorbers.
9. Professor S. Ganesh (BSBE) has been elected to the Fellowship of the Indian National Science Academy (INSA).
10. Professor Arun Shukla (BSBE) has been elected to the Fellowship of the Indian National Science Academy (INSA).
11. Professor Yogesh M. Joshi (CHE) has been elected to the Fellowship of the Indian National Science Academy (INSA).
12. Professor Javed N Malik (ES) has been elected to the Fellowship of the Indian National Science Academy (INSA).
13. Professor Jayant K. Singh (CHE) has been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2022.
14. Professor Nitin Saxena (CSE) has been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2022.
15. Professor Santanu K. Mishra (EE) has been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2022.
16. Professor J. Ramkumar (DES) has been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2022.
17. Professor Monica Katiyar (MSE) has been elected to the Fellowship of the Indian National Academy of Engineering (INAE) 2022.
18. Professor Yogesh M. Joshi (CHE) has been elected as a fellow of the Society of Rheology. The Society of Rheology was officially formed in 1929.

19. Dr. Dootika Vats (MTH&S) has been invited to join the editorial board of the journal, Sankhya Series B as an Associate Editor.
20. Professor Abhay Karandikar (Director, IITK) has been nominated as the Chairman of the Executive Committee of the National Science Centre Delhi and a member of the National Council of Museums by the Ministry of Culture.
21. Professor Ashutosh Sharma (CHE) was selected as the President of the Indian National Science Academy in June 2022.

STUDENTS AWARDS

1. Mr. Soumarup Bhattacharya (16101270, PhD/AE) has won the Flow Visualization Showcase Award at the American Institute of Aeronautics and Astronautics (AIAA) conference in Chicago for his work "Blockage effect on the wake of a rotationally oscillating tapered cylinder".
2. Ms. Sukanya Karmakar (21103275, PhD/CE) has won the Best Poster Award in the two-day symposium on Socio-Technological Aspects of Seismic Disaster and Mitigation (STASDM-2022) held during 23-24 June 2022, hosted by the Centre for Disaster Management and Research, Indian Institute of Technology Guwahati, for her poster titled "A seismic design procedure for steel braced frame buildings with SMA-based self-centring dampers".
3. Mr. Darshan Prakash Borthakur (20104273, PhD/EE), Mr. Ashok Narayan Tripathi (20104269, PhD/EE) and Mr. Nimmala Pavan Kalyan (20104074, MTech/EE) have received the Best Student Paper Award in the 2022 Joint Conference on Electrostatics held on 12-15 June 2022, in Charlotte, North Carolina, USA. Their papers have been selected for consideration of the EPC and invited for publication in the IEEE IAS Transactions on Industry Applications. The conference was jointly organised by the Electrostatic Society of America (ESA), the Institute of Electrostatics Japan (IEJ), la

Société Françaised' Electrostatique (SFE), the Electrostatic Processes Committee (EPC) of the IAS/IEEE and the Electrostatic Committee of the Chinese Physical Society (ECCPS).

4. Mr. Meesam Jafri (18104281, PhD/EE) and Mr. Suraj Srivastava (15204275, PhD/EE) have been awarded the Qualcomm Innovation Fellowship (QIF) India 2022 for project titled "Orthogonal Time-Frequency Space (OTFS) Modulation for Joint Radar and Communication (RadCom) in mm Wave Massive MIMO Systems".
5. Ms. Sona Tiwari (18207281, PhD/CHM), Ms. Suchismita Ghosh (17107288, PhD/CHM) and Ms. Shreyasi Banik (20107305, PhD/CHM) have received the Best Poster Presentation Award by the ACS-Journal of Medicinal chemistry during the 29th CRSI-National Symposium in Chemistry held at IISER Mohali.
6. Mr. Arghya Sen (18507261, PhD/CHM) has received the Best Poster Award at the 29th CRSI-NSC meeting held recently at IISER Mohali.
7. Mr. Shreyansh Tatiya (17119263, PhD/DES) has received the prestigious NAMASTE+ Grant at the Georg-August-Universität Göttingen (UGOE), Germany for the winter semester to carry out collaborative research. NAMASTE+ is a mobility and research cooperation project between the Georg-August Universität Göttingen and 12 Indian Higher Education Partner Institutions. The project is financed by the DAAD and the German Ministry of Education and Research within the Programme “A New Passage to India”.
8. Mr. P. Mohan Anand (20111282, PhD/CSE) and Mr. P. V. Sai Charan (19111270, PhD/CSE) have been selected for the Best Student Paper Award at the 2022 IEEE International Conference on Cyber Security and Resilience. This award recognizes especially meritorious papers, which are submitted by undergraduate or graduate students, dealing with a subject related to the IEEE CSR technical scope.

9. Ms. Flamina A. (19106265, PhD/MSE) has received the Best Oral Presentation Award at the 2nd International Conference on Sustainable Materials and Technologies for Bio and Energy Applications held at SSN College of Engineering, Chennai.
10. Mr. C. S. Bhargav (19111269, PhD/CSE) and Mr. Sagnik Dutta (211364, MSc/MTH&S) have been selected for the Best Student Paper Award at the 47th International Symposium on Mathematical Foundations of Computer Science (MFCS 2022). The paper was titled “Improved Lower Bound, and Proof Barrier, for Constant Depth Algebraic Circuits”.
11. Mr. Upendra Singh Yadav (14118272, PhD/BSBE) has received the Best Poster Award at the EMBO Workshop- Cell and Development System, Switzerland held during 22-26 August 2022. The award carries a certificate of appreciation and a cash prize. He presented his research on the topic "Molecular basis of joint site specification during vertebrate limb skeletal development”.
12. Ms. Swathi Swaminathan (15207274, PhD/CHM) has received the Best Poster Award in the Faraday Discussions meeting, for the poster titled "Hot Hole mediated catalytic oxidative scission of alkenes using Hybrid Plasmonic Nanoparticles". The event was organized by the Royal Society of Chemistry (RSC) and held in London during 21 -23 September 2022. The award includes a certificate and a cash voucher from RSC.
13. Dr. Prasanta Bandyopadhyay (Post Doc/CHM) has been awarded a Best Poster Award in the conference, Current Trends in Theoretical Chemistry-2022, organised by DAE-BRNS at BARC, Mumbai.
14. Mr. Nilesh Pandey (18104282, PhD/EE) has been awarded the 2022 IEEE Electron Devices Society PhD Student Fellowship. The Fellowship Program was established to promote, recognize, and support graduate study and research within the Electron Devices Society’s field of interest.

15. Mr. Tejas Ketkar (18807822, BT-MT/EE) has been awarded the 2022 IEEE Electron Devices Society Undergraduate Student Fellowship. The Fellowship is established to promote, recognize, and support Undergraduate level study and hands-on experience within the Electron Device Society's field of interest.
16. Mr. Sushanta Barman (18109869, PhD/PHY) and Ms. Kalyani Barman (16109865, PhD/PHY) have received the Poster Award in the recently concluded 6th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2022).
17. Ms. Swati Swagatika Mishra (18109277, PhD/PHY) has received the Poster Award in the recently concluded 6th Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2022).
18. Ms. Nanda Rani (21111265, PhD/EE) has been awarded the Raman-Charpak Fellowship 2022.
19. Ms. Nidhi Garg (18107276, PhD/CHM) has been awarded the Raman-Charpak Fellowship 2022 for a four-month research stay in France.
20. Mr. Eshaan Srivastava (17223261, PhD/ES) has received a Fellowship from International Union for Quaternary Research (INQUA) to undertake part of his research in Italy.
21. Aditya (20103264, PhD/CE) has secured the Second Position in AABtonics which is an international GIS competition inviting Innovative solutions for the GIS industry. The award carries a cash prize and a certificate of appreciation.
22. Ms. Ritama Kar (19207274, PhD/CHM) has been awarded the Best Poster Award in the conference, Designing Catalysts on Computers – 2022, organized by the Indian Association for the Cultivation of Science (IACS), Kolkata on 02-03 December. She presented a poster entitled "Chemical Reactions using molecular dynamics at the Fourth Rung of DFT Functionals."
23. Ms. Shalini Arora (16102278, PhD/CHE) has received Best Poster Award in the 9th Interdisciplinary Symposium on Ma-

terials Chemistry 2022 held at Bhabha Atomic Research Centre (BARC), Mumbai during 7-10 December 2022.

24. Mr. Jitendra Tahalyani (17112261, PhD/MSP) has received the Best Student Paper Award (Male Category) at the IEEE Microwave, Antennas, and Propagation Conference, held during 12-14 December 2022 at Bangalore.
25. Ms. Apala Banerjee (18104267, PhD/EE) has received the Best Female Student Paper Award (1st Runner Up) at the IEEE Microwave, Antennas, and Propagation Conference, held during 12-14 December 2022 at Bangalore.
26. Mr. Utkarsh Kumar (18227261, PhD/ECO) has won the Best Paper Award at the CRISIL Doctoral Symposium of India Finance Conference (IFC-2022) held at IIM Calcutta during 19-21 December 2022.
27. Mr. Sumit Kumar Sahu (20206268, PhD/MSE) has received the Best Poster Award at the recently held International Conference on Frontiers in Materials Engineering (ICFME-2022) organized by the Department of Metallurgy Engineering and Materials Science, Indian Institute of Technology Indore during 14-16 December 2022.
28. Ms. Shreyasi Som (17104282, PhD/EE) and Mr. Anubrata Das (15104262, PhD/EE) have been awarded the POSOCO Power Systems Award 2023 in the Doctoral category for their thesis work.
29. Nitish Gupta (17516261, PhD/PSE) has been chosen to write a featured article in Applied Physics Letters on "Spectroscopic ellipsometry of topological aspects of photonic Stopbands".
30. Ms. Srijani Nag (18100275, PhD/HSS) has been selected as an Australia India Research Student Fellow for 2023. The program is funded by the Australian government, and she will be visiting La Trobe University to work on the project titled “Medicine Colonization of Women in Love, Loss, and What We Ate”.

31. Ms. Priyanka Chakraborty (17207267, PhD/CHM) has been awarded the Best Poster Presentation Prize at the conference, Modern Trends in Inorganic Chemistry (MTIC) XIX held at Banaras Hindu University, Varanasi on 15-17 December 2022. The title of the poster is "High-Valent Cobalt-Catalyzed Hydrogen Borrowing Reactions and Mechanistic Investigations".
32. Mr. Niranjan Chatterjee (19118272, PhD/BSBE) has received the Best Poster Presentation Award at the 32nd National Conference of Society for Biomaterials & Artificial Organs (India) and International Conference of Bio-Remedi 2022 at IIT Guwahati, India held during 14-15 December 2022. He has received the award for his work "Musculo-responsive Polymer Carbon Composite (MusCaCo) as a Potential Therapeutic Material for Quick Recovery of Mechanically Damaged Skeletal muscles".
33. Mr. Naveed UI Hassan Bhat (19103274, PhD/CE) has received the Professor U.C. Kothyari - ISH Best MTech thesis Award from the Indian Society for Hydraulics. The award carries a certificate and a token cash prize. Naveed has received this award for his thesis titled "Diffusion Wave Approximation of Depth-Averaged Flow Interaction with Porous Media".
34. Mr. Aqib Khan (15101261, PhD/AE) has received the Best Poster Award under the Granular Flows category in the 16th Complex Fluids Symposium – 2022 (CompFlu 2022) held at the Research Park of IIT Kharagpur in Kolkata during 19-21 December 2022. The title of his poster is "Characteristics of shallow granular flow past a cylinder" which is authored by three other students of Aerospace Engineering - Yash Jaiswal, Adarsh Kumar, and Deepika Chimote.
35. Ms. Namrata Baruah (15118266, PhD/BSBE) has received the Bajpai-Saha Student Award for Best Student Paper Presentation at the 32nd National Conference of Society for Biomaterials & Artificial Organs India (SBAOI) and Interna-

tional Conference of Bio-Remedi 2022 at IIT Guwahati, India held during 15-18 December 2022. She has received the award for her presentation titled - "Biomimetic nanovaccines for multi-drug resistant diarrhea".

36. Ms. Ekta Srivastava (18118263, PhD/BSBE) has received Best Oral Presentation Award in BIO-Remidi2022: International Conference on Biomaterials, Regenerative Medicine, and Devices held during 15-18 December 2022 at IIT Guwahati. She has received the award for her work titled “An electrically conducting nanofibrous Electroband: Combinatorial approach to tackle nerve injury”.
37. Ms. Triya Saha (19118282, PhD/BSBE) has received Best Poster Presentation Award in BIO-Remidi2022: International Conference on Biomaterials, Regenerative Medicine and Devices held during 15-18 December 2022 at IIT Guwahati. She has received the award for her work titled “Digital Light Processing Based 3D Printed Exosome Laden Cellular Constructs to Alleviate Acute Liver Injury in Animal Models”.
38. Dr. Shubhi Pandey (16118272, PhD/BSBE) has been selected for the prestigious NASI-Platinum Jubilee Young Scientist Award, 2022. This award is given to young scientists in recognition of their notable contributions made in any branch of science and technology through the work carried out in India.
39. Ms. Ayesha Nanda (18109263, PhD/PHY) has received the 2022 Best Student Paper Award at the International Conference on Plasma Science and Applications (ICPSA 2022), held as an e-conference from 28 to 30 December 2022. The title of her oral presentation was "Temperature anisotropy governed current density profiles in a plasma confined by a dipole magnet driven at steady state”.
40. Mr. Nitish Kumar Gupta (17516261, PhD/PSE) has been awarded the Best Thesis Award in the DAE-BRNS National Laser Symposium (NLS-31) held at IIT Kharagpur. The award carries a certificate and a cash prize.

41. Mr. Usama Ghayas Syed (17200269, PhD/HSS) has received the Best Paper Award for his paper titled "Testing a Multidimensional Model of Student Success Using a Construct Validation Approach". The paper was presented at the 12th International Conference on Meeting the Challenges in School: Towards Atmanirbhar Bharat organized by the Pondicherry University and Indian School Psychology Association (InSPA) during 2-4 October 2022.
42. Mr. Sharath H. Padmanabha (19111410, MS/CSE), Mr. Fahad Shaikh (19111034, MTech/CSE), Mr. Mayank Bansal (20111032, MTech /CSE), Mr. Debanjan Chatterjee (20111016, MTech /CSE), and Ms. Preeti Singh (20111044, MTech /CSE), have been awarded the Best Paper Award in the 16th Innovations in Software Engineering Conference held in February 2023. The title of the paper was “Advances in Automated Pedagogical Error Repair".
43. Mr. Aritra Bagchi (17103265, PhD/CE) has won the Second Prize for Best Paper Presentation for his paper entitled "A Numerical Study on the Abutment-Backfill System Subjected to Lateral Loading" in the Indian Geotechnical Conference (IGC 2022) held at Kochi during 15-17 December 2022.
44. Mr. Amit Chandak (18111262, PhD/CSE) has received The Best Paper Award for his paper titled "Gradient Perturbation-based Efficient Deep Ensembles" at the 6th Joint International Conference on Data Science and Management of Data (CODS-COMAD 2023) held at IIT Bombay during 4-6 January 2023.
45. Ms. Apala Banerjee (18104267, PhD/EE) has received the IEEE Microwave Theory and Technology Society (MTT-S) Graduate Fellowship Award bestowed for excellence in research and academics in the field of RF and Microwave Engineering. The award consists of a certificate of recognition, fellowship, and travel support to attend the annual IEEE MTT-S Microwave Symposium to receive the award.

46. Ms. Manorama Dey (20107284, PhD/CHM) has been awarded the First Prize for Best Paper Presentation for her poster entitled "Probing Virus Binding to Giant Plasma Membrane Vesicles with Fluorescence Microscopy Technique" at the International Conference on Advanced Biomedical Imaging, organized by IIT Madras.
47. Mr. Vineet Arora (20114274, PhD/IME) has secured the prestigious Australia India Research Students (AIRS) Fellowship -2023 for his work titled, “The application of positive psychology in the remote work context”.
48. Mr. Kaustubh Pabba (180494, BTech/EE) has received the MTT-S Undergraduate/Pre-graduate Scholarship for the year 2023. This scholarship is awarded to less than ten students every year from across the globe by the IEEE MTTS society, and is based on the academic performance, and the relevance and impact of the project that the student is working on. He has been invited to San-Diego to receive his award during the IMS2023 conference.
49. Ms. Pooja Aggarwal (20107323, PhD/CHM) has received the Best Poster Award in the Conference on Advances in Renewable Energy (CARE-2023), jointly organised by HRI, Prayagraj and TIFR-Hyderabad. The title of the poster was “Unidirectional funneling of energy from water-dispersed perovskites to molecular photocatalysts".
50. Ms. Priyanka Chakraborty (17207267, PhD/CHM) has received the Best Poster Award in 30th CRSI National Symposium in Chemistry that was held at Jawaharlal Nehru University (JNU). The title of her paper was “Alcohols as the alkylating agent under base metal catalysis: applications and the underlying mechanistic landscape”.
51. Ms. Dolly Chandel (18207263, PhD/CHM) has received the Best Poster Award in 30th CRSI National Symposium in Chemistry that was held recently at JNU. The title of the paper was “Modulation of Supramolecular Chirality by Stepwise Axial Coordination in a Nano Size Zn(II) porphyrin Trimer”.

52. Mr. Pradeep Sachan (19107291, PhD/CHM) has received the Best Poster Award in 30th CRSI National Symposium in Chemistry that was held at JNU. The title of the paper was “Coordination-driven optoelectroactive molecular thin films in electronic circuits”.
53. Ms. Kajal Chaudhary (15112263, PhD/MSP) has received the Best Poster Award in 30th CRSI National Symposium in Chemistry that was held at JNU. The title of the paper was “Broad Spectrum Antimicrobial Metallopharmaceutical Agents Targeting MRSA and VRSA”.
54. Dr. Ankur Malik (Post Doc/ CHM) has received the Best Poster Award, for the poster entitled "Nanoscale all-organic molecular electrochemical supercapacitors: A step closer to molecular power banks”, presented at the 2nd International Conference on Electrochemistry for Industry, Health and Environment held during 7-11 February 2023 at Bhabha Atomic Research Centre, Mumbai.
55. Mr. Deepak M. Khushalani (20218264, PhD/BSBE) has won the Best Poster Presentation Award at the Annual Prime Minister's Research Fellowship (PMRF) Symposium organized at IIT Madras on 17-18 February 2023. He has received the award for his work, "Regulation of cellular transport probed by super resolution microscopy".
56. Ms. Ankita Das (17118001, MTech/BSBE) has received Best Oral Presentation Award in the basic research category of Advances in Cardiovascular Medicine and Research (ACMR 2023) on the topic "Elastomeric antioxidant cardioprotective patches: A paradigm bioengineered intervention". The conference was organized by cardiovascular research group, postgraduate institute of medical education and research, Chandigarh under the aegis of International Academy of Cardiovascular Sciences (India section) and International Society for Heart Research (India section), during 16-18 February 2023.

57. Mr. Shubham Rathi (14203266, PhD/CE) has received the Best Paper Award at the 2nd Asian Conference on Indoor Environmental Quality (ACIEQ) organized during 24-25 February 2023 at the Indian Aviation Academy, New Delhi. The talk was titled "Using viable and low-cost interventions that reduce particle levels can enhance the operating efficiency of occupants".
58. Mr. Shantanu Sen (13218066, PhD/BSBE) has received the Augmenting Writing Skills for Articulating Research (AWSAR) Award 2022 under the Best Stories in PhD category.
59. Mr. Atul Kumar Soni (18104270, PhD/EE) has received the Augmenting Writing Skills for Articulating Research (AWSAR) Award 2022 under the Best Stories in PhD category.
60. Ms. Jayasandhya Meenakshinathan (19104268, PhD/EE) has received the Augmenting Writing Skills for Articulating Research (AWSAR) Award 2022 under the Best Stories in PhD category.
61. Mr. Sreerag Ashok (14119265, PhD/DES) has received the Best Paper Award at 50th National Symposium on Acoustics 2023. The Symposium was organized by the Acoustical Society of India (ASI) and Veer Surendra Sai University of Technology (VSSUT) at Burla, Odisha during 24-26 February 2023. Sreerag's oral presentation was titled "Investigating the asymmetry in tension in a tabla membrane from a musical perspective".
62. Ms. Sneha Gupta (16118273, PhD/BSBE) has received the Augmenting Writing Skills for Articulating Research (AWSAR) Award 2022 under the Best Stories in PhD category. The title of the story was “Backing the bone: Bringing peace to broken pieces”.
63. Ms. Jyoti Tripathi (15118264, PhD/BSBE) has received the Augmenting Writing Skills for Articulating Research

(AWSAR) Award 2022 under the Best Stories in PhD category.

64. Ms. Aakanksha Jain (19102261, PhD/CHE) has received the Augmenting Writing Skills for Articulating Research (AWSAR) Award 2022 under the Best Stories in PhD category.
65. Mr. Baljinder Singh Heera (16204267, PhD/EE) has received the Best Paper Award for his paper titled "Fragmentation-Aware RCSA Algorithm for Fair Spectrum Allocation in SDM-EON" in the Communication and Signal Processing track at the 2023 2nd Edition of IEEE Delhi Section Flagship Conference (DELCON) organised during 24-26 February 2023.
66. Mr. Arghya Sen (18507261, PhD/CHM) has received the Best Poster Award in Perovskite Society India Meet 2023 (PSIM-2023), jointly organized by the Department of Physics and Centre for Flexible and Smart Energy Devices, IIT Roorkee on 1-3 March 2023.
67. Ms. Ayushi Sharma (19104263, PhD/EE) has received the Best Poster Award at the 7th IEEE Electron Devices Technology and Manufacturing Conference (EDTM) 2023, held in Seoul, South Korea from 7–10 March 2023. She presented a poster entitled "Analysis and Modelling of OFF-State Capacitance in LDD MOSFETs".
68. Mr. Sumit Chatterjee (eMasters/EE) has received the Best Paper Award for his paper titled "Field Demonstration of Disaggregated Optical Network Consisting of ZR+ and Coherent Channels Using Power Equalization by Switched Gain Equalization Controlled Amplifiers (M2G.2)" in the Data Centre Networking and PON Security track at the 2023 edition of OFC conference at San Diego, USA organized during 05 – 09 March 2023.
69. Ms. Farheen Anjum (14106262, PhD/MSE) has received the Best Poster Presentation Award at the World Conference on Thermoelectrics and Materials (WCT-2023) held on 14-18

March 2023. The title of his presentation was "Enhancement of thermoelectric properties of bismuth sulfide by compositing with graphite".

70. Mr. Subhra Sourav Jana (18106277, PhD/MSE) has received the Best Oral Presentation Award at the World Conference on Thermoelectrics and Materials (WCT-2023) held on 14-18 March 2023. The title of his presentation was "Waste heat recovery using oxide based nano composites for high temperature thermoelectric power generator".
71. Mr. Vivek Kumar (21206264, PhD/MSE) has received the Best Poster Presentation Award at the World Conference on Thermoelectrics and Materials (WCT-2023) held on 14-18 March 2023. The title of his presentation was "Thermoelectric properties of Manganate based high entropy oxide ".
72. Mr. Manish Kumar (18107275, PhD/CHM) has been awarded the ACS Best Poster Award in the National Symposium, Recent Advances in Chemical Sciences (RACS-2023), held in Dr. Harisingh Gour Vishwavidyalaya, Sagar during 16-17 March 2023.
73. Ms. Garvita Dhanawat (20107279, PhD/CHM) has been awarded the First Prize for Poster in the 5th National Students' Research Convention held at IIT Kanpur on 3-5 March 2023. She presented a poster entitled “Elucidating Growth Kinetics of Giant Plasma Membrane Vesicles for their Application as Model Membrane System”.
74. Mr. Bharat Singh (17207263, PhD/CHM) has been awarded the RSC Best Oral Presentation Award in the National Symposium, Recent Advances in Chemical Sciences (RACS-2023) held in Dr. Harisingh Gour Vishwavidyalaya, Sagar during March 16-17, 2023.
75. Mr. Manish Kumar Gupta (21204405, MS/EE) has won the 3rd prize in the IEEE Empower a Billion Lives competition organized by the IEEE Power Electronics Society. This compe-

tition was held at the IEEE Applied Power Electronics Conference (APEC) in Orlando, USA during 19-23 March 2023.

76. Ms. Nidhi Garg (18107276, PhD/CHM) has received the Best Poster Award, for the poster entitled "Dehydrogenative Methanol Activation and its application as Transfer Hydrogenating reagent under homogeneous catalysis", presented at the Science Day of the French Chemical Society, Occitanie Pyrénées Section, held on 24 March 2023 at Laboratoire de Chimie de Coordiantion, Toulouse, France.
77. Ms. Shivangi Mittal (20202261, PhD/CHE) has been awarded the prestigious Foreign Fulbright India Doctoral Research Fellowship.
78. Mr. Ashish Tiwari (21129004, MTech/SEE) and Mr. Shiv Shakti Singh (21129024, MTech/SEE) have secured 3rd rank globally in the Green Olympiad 2022 organized by The Energy and Resources Institute (TERI), New Delhi on 11 November 2022.
79. Mr. Rishabh Verma (211360, MSc/PHY) has been awarded the prestigious Chanakya Fellowship from the I-HUB Quantum Technology Foundation, IISER Pune.
80. Mr. Abhishek Kumar Yadav (20107261, PhD/CHM) has received the Best Oral Presentation Award at the International Conference on Molecules and Materials Technology (MMT-2023), held at NIT Kurukshetra on 21-22 April 2023. Title of his talk was “Facile synthesis of high performing energetic materials.”
81. Dr. Apurva Panjla (14207263, PhD/CHM) has received the 2023 IUPAC- Solvay International Award for Young Chemists for the Best PhD Thesis. She will receive a commemorative plaque and a cash prize. Also, she is invited to present a poster at the 49th World Chemistry Congress (WCC) at The Hague, Netherlands in August 2023, and contribute a review article in Pure and Applied Chemistry.

82. Mr. Anandhakrishnan S. (21106006, MTech/MSE) has received the Best Poster Award Second Prize at the International Workshop on High Entropy Materials (IWHEM) 2023 held during 23-25 April 2023, at BARC. He has received the award for his poster titled “Crystal plasticity simulation of deformation behaviour of equiatomic FeCoNi medium entropy alloy in compression at quasistatic and dynamic strain rate regime”.
83. Mr. Moirangthem Bikramjit Singh (21116006, MTech/PSE) has received the I-HUB Quantum technology foundation Chanakya Postgraduate Fellowship. This fellowship is awarded to perform a Quantum-technology development project titled “Doubling the frequency of an infrared laser using Potassium niobate crystal for barium ion spectroscopy”.
84. Mr. Pushpendra Kumar Yadav (18209268, PhD, PHY) has received the award for The Best Poster in the International Workshop on "Frontiers in Excited State Electronic Structure Methods: from Spectroscopy to Photochemistry". This workshop was held during 16 - 19 May 2023 at the International Centre for Theoretical Physics (ICTP), Triesty, Italy. Pushpendra's poster was titled "Room temperature electron-hole liquid phase in monolayer $MoSi_2Z_4$ (Z = pinctogen)".
85. Ms Nandita Pan (19109869, PhD/PHY) has received the Best Poster Presentation Award at the National Assembly of Researchers in Physics, which was held at IISER Bhopal on 25- 26 August 2022. The title of her poster is “Exact relation for Energy Transfer in Simple and Active Binary Fluid Turbulence – a False Friend of Incompressible MHD Turbulence” which is based on her recent paper published in Physical Review.

LIST OF MAJOR PROJECTS SANCTIONED

1. Cyber Security Capability Maturity Model (NATIONAL SECURITY COUNCIL SECRETARIAT)

2. DRDO Industry Academia-Centre of Excellence (DIA-COE): Project for Managing Running and Operational Expenses of Coe (DRDO)
3. Regional Centre for Geodesy (DST)
4. Translation (Speech to Speech Machine Translation) of Swayam MOOCS, NPTEL (MINISTRY OF EDUCATION)
5. Developing Affordable and AI Enabled Handheld X-ray Device for Tuberculosis Diagnosis (ICMR)
6. Understanding The Role of Macrophage Stimulatory (Gs) And Inhibitory (Gi) G-Protein Signaling in Obesity and Type 2 Diabetes by using a Chemo genetic Strategy (WELLCOME TRUST-DBT alliance)
7. FIST Project – Department of Physics (DST)
8. SWAYAM-MOOCS (css-moocs) (MINISTRY OF EDUCATION)
9. SRBD/RBD Based Modelling, Simulation, and Control of 18 DOF QRS, and Experimental Validation on Test Bench (DRDO)
10. Establishment of Integrated Benchmarking Facility for Electric Propulsion for UAV Systems at Cybersecurity Centre (UPEIDA)
11. Building Unique Magneto-Optical setup with capability for simultaneous Imaging of Electric Current, Magnetization & Bulk Transport Measurement at Low Temperature with Vector Magnet for Imaging Strong Correlation Driven Topological Insulator & its Heterostructures (SERB)
12. Exploring Chemistry at the Molecular Level Using High-Resolution IR Spectroscopy in Superfluid Helium Nanodroplets (SERB)
13. Disentangling The Role of Spatial Cell type Architecture, Cell-State Transitions, Regulatory Programs, and Cell-Cell Communications in Cancer through Multiomics Analysis-Application in Cervical Cancer (WELLCOME TRUST DBT)

14. 3237-Indo-Italian Centre of Excellence for Restoration and Assessment of Environmental Impacts on Cultural Heritage Monuments (DST)
15. Laboratory Testing for Ongoing Study on Hydrogen Blending in Natural Gas (GAIL)
16. Radio Transceiver Assisted EM Side Channel Attack on Crypto Core and Screen Gleaning Using Deep Learning (DRDO)
17. Investigation of Magnetization Switching Dynamics in Magnetoelectric Heterostructures (SERB)
18. Development of High- Energy Density Cathode for All-Solid-State Na-Ion Battery (SERB)
19. Landscape and Tectonic Evolution of Great Rann of Kutch (Grk): Short-Term (Holocene) and Long-Term (50-100 Ka) Impact on Human Settlement & Resources (MINISTRY of EARTH SCIENCES)
20. Design And Fabrication of Light-Weight Flexible Polarization Independent Broadband Rf and Microwave Absorber Based on Active/Passive Anisotropic Metamaterial (SERB)
21. Kanpur Smart City Project: Improving the Existing Infrastructure and Data Quality Via Observation, Calibration, Data Analysis, Machine Learning and Optimization (KANPUR SMART CITY LIMITED)
22. Experimental Investigation of Aerodynamic Force and Moments of Parachute in Presence and Absence of Crew Model (ADRDE)
23. To Support the Rural Air Quality Monitoring Project (OPEN PHILANTHROPY)
24. Technology to Integrate, Secure and Analyze (HARYANA PARIVAR PEHCHAN AUTHORITY)
25. Nozzle And Air Intake Design for UAV (ADE)

26. Optimal Gait Generation, Balance and Control Design with Experimentation for Legged Robot Locomotion on Uneven 3D Terrain (DRDO)
27. PPP Mode Industry Projects (Prototype Development Fund) (ASM CIRCUITS PVT.LTD)
28. Single-Emitter Spectroscopy via Photon Correlations (SERB)
29. Smart Edge Caching over 5g Networks in a Federated Learning Framework (SEAGATE TECHNOLOGY LLC)
30. Text-To-Text Translation Among Indian Languages using Sanskrit-Based Interlingua Representation (MEITY)
31. Nanorobotic Drug Delivery System & Lab-On-Chip Platform Development (IHUB FOUNDATION FOR COBOTICS)
32. Centre of Excellence on Air Quality Monitoring Technology (CHILDREN'S INVESTMENT FUND FOUNDATION)
33. Dynamic Hyper-Local Source Apportionment for Real-Time Policy Action (CLEAN AIR FUND)
34. Comprehensive Source Apportionment/Emission Inventory and Carrying Capacity for Khurja, Raebareli, Anpora, Gajraula, Jhansi and Firozabad Cities in the State of Uttar Pradesh (UPPCB)
35. Production Enhancement Study (VEDANTA LIMITED)
36. GIS/GPS Mapping of Waqf Properties in the State of Uttar Pradesh (UTTAR PRADESH SUNNI CENTRAL WAQF BOARD)
37. Wind Tunnel Model Design, Fabrication for Single Engine Twin Boom UAV Configuration, Wind Tunnel Testing for Single Engine Twin Boom UAV Configuration (ADE)
38. DHSA at Kanpur (RAIL INDIA TECHNICAL & ECONOMIC SERVICES LTD)
39. IIRST Software Algorithms Development with IIT Kanpur as per Specifications /Scope of Work (HAL)
40. Wind Tunnel Testing of TVP 1:33 Scale Model High Angle of Attack and Liftoff (VSSC)

41. Study of Structural of the Large Span of Roof Structure of Convention Centre and of Remedial Measures (INDIA TRADE PROMOTION ORGANIZATION)
42. Blast Furnace Burden Distribution Prediction Simulation Software (TATA STEEL LTD)
43. GAN Model for RF Power Amplifier (WAVETEK MICROELECTRONICS)
44. Digitizing And Automating Pli Information Management Systems (MECON LTD, RANCHI)
45. Predicting Ion Conductivity and Deducing Structure -Property Relationships for Hydrated Anion Exchange Membranes Using Molecular Dynamics Simulations (SHELL)
46. TPQA Activities at IIT Jodhpur (IIT JODHPUR)
47. Easiur India: Development of Air Quality Modeling Decision Support Tools for Policy-Makers (INTERNATIONAL SUSTAINABLE ENERGY FOUNDATION)
48. Geotechnical Adequacy Regarding Review of Structural Health Condition of Five Arch Type Railway Bridges (Br.No.545,546,570,573,575) between LKO to Raebareli Section Under LKO Division of North Railway (RAIL VIKAS NIGAM LIMITED)
49. LCA & TCO Analysis of 4W, ICEV, BEV & HEVS (NEDO)

LAB/FACILITIES DEVELOPED IN THE DEPARTMENT

1. Jeet Bindra Unit Operation and Innovation Lab (CHE)
2. Centre for Developing Intelligent Systems" (CDIS) (CSE)
3. Distributed Control and Decision Laboratory (DCoDe Lab) (EE)
4. Mobile Wireless EEG lab (CGS)
5. Mobile Wireless, head-mounted eye tracking lab (CGS)
6. The Centre for Developing Intelligent Systems (CDIS) lab (CGS)

7. Super-resolution STORM/PALM imaging platform (BSBE)
8. Flash sintering in controlled atmosphere lab (MSE)
9. Liquid Chromatography and Gas Chromatography along with Mass Spectrometry Lab (SEE)
10. SERB-IRHPA 'Centre for Rechargeable Energy Storage Systems for Augmenting Transportation and Electrification (CREATE)' (SEE)
11. Ultrafast Spectroscopy Lab with Transient Photoluminescence Spectrometer and Microscope (SEE)
12. Battery Fabrication Lab for Coin Cells and Pouch Cells (SEE)
13. Battery Testing Lab (SEE)
14. DST Materials Acceleration Platform Centre (SEE)
15. Building Energy and Air Quality Research (BEAR) Laboratory (SEE)
16. Electrochemistry and Transport for Design of Energy Systems (ElecTroDES) Laboratory (SEE)
17. Thermal Systems Laboratory (TheSLa) (SEE)

SOFTWARE DEVELOPED

1. "dbAQP-SNP", a database of missense single nucleotide polymorphisms in human aquaporins (PI: Dr. R Sankararamakrishnan, BSBE)
2. Analyzing citizen records, across multiple databases, to do income estimation for an Indian state (CDIS Team, CSE)
3. Anomaly detection in Drone images, with applications in the defense and highway sectors (CDIS Team, CSE)
4. Grievance characterization and redressal system of various Ministries (CDIS Team, CSE)
5. Image analysis and certification for the national testing agency (CDIS Team, CSE)
6. Routing of police patrol vehicles, with applications to other routing/scheduling problems (CDIS Team, CSE)
7. Crystal pole figure (PI: Dr. Shikhar Krishn Jha, MSE)
8. A Software Package for Simulating the Performance of Single and Multijunction Solar Cells (PI: Dr. Kanwar Nalwa, SEE)
9. A Comprehensive Code for Predicting the Thermal, Mass Transfer, and Electrochemical Behavior of Batteries (PI: Dr. Kanwar Nalwa, SEE)
10. A PEM Electrolyzer Simulator is Developed (PI: Dr. Lalit M. Pant, SEE)

TECHNOLOGIES DEVELOPED

1. Handheld and portable smart diagnosis device for early detection of Oral Cancer (PI: Dr. Jayant Singh, CHE)
2. An automated audit and reconciliation system for the Ministry of Steel, capable of extracting information from pdfs and images of invoices by suppliers operating PLI schemes for the Ministry. This system reduces human involvement in the PLI management

system by an order of magnitude (PI: Dr. Shalabh (MATH), Dr. Nisheeth Srivastava (CSE)

3. A combination comprising sulfated carboxymethylcellulose and tissue inhibitor of metalloprotease 3 (timp3) for osteoarthritis (PI: Dr. D.S. Katti, BSBE)
4. Sulfated carboxymethyl cellulose functionalized electrospun fibers for electrostatic immobilization of cationic molecules (PI: Dr. D.S. Katti, BSBE)
5. A combination of anti-catabolic and pro-anabolic agents for the treatment of osteoarthritis (PI: Dr. D.S. Katti, BSBE)
6. Bone graft material for the regeneration of critical-sized bone defects (PI: Dr. D.S. Katti, BSBE)
7. Low temperature milling (PI: Dr. Shikhar Krishn Jha, MSE)
8. Equipment to detect liquid level of metal during the progress of melting (PI: Dr. Amarendra Singh, MSE)
9. Biochar based steelmaking (PI: Dr. Amarendra Singh, MSE)
10. Radiation Calorimeter (PI: Dr. Laltu Chandra, SEE)
11. Open Volumetric Air Receiver (PI: Dr. Laltu Chandra, SEE)
12. Solar Convective Furnace System for Heat Treatment of Metal (PI: Dr. Laltu Chandra, SEE)
13. Solar Thermal based NH3 Heating System for Hydrogen Production (PI: Dr. Laltu Chandra, SEE)