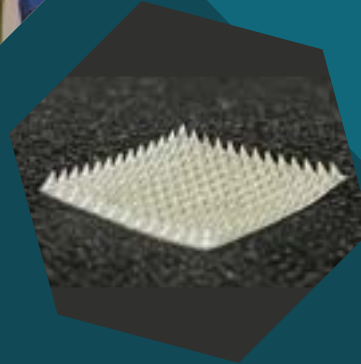


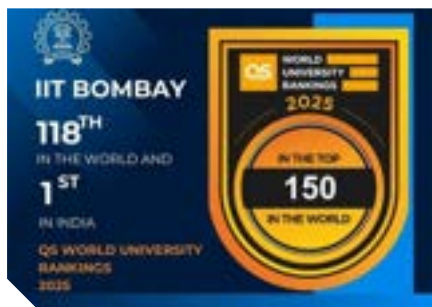


R&D Highlights 2024

Indian Institute of Technology Bombay



Awards & Achievements



IITB secures 1st rank in India and 118th rank globally in the QS World University Ranking 2025



Dedication of indigenous anti-cancer CAR-T cell therapy to the nation



IITB ranked 3rd in the overall category of National Institutional Ranking Framework (NIRF) 2024



Prof. Vikram Vishal receives the National Geoscience Award from Ministry of Mines



Prof. Sachin Patwardhan receives the 2024 INFORMS Franz Edelman Finalist Award



Prof. Rohit Srivastava receives the Rashtriya Vigyan Puraskar: Vigyan Shri 2024



Prof. Prasanna Gandhi honoured for his contribution to Chandrayaan-3 mission



Prof. Amartya Mukhopadhyay and Prof. Rajiv Dusanre receives the BPCL Innovation Award 2024



Team SHUNYA secures 1st place in US Solar Decathlon Design Challenge 2024



IIT Bombay wins Nan Pao Resin Zero Carbon Award at the International Net Zero Tech Competition 2024



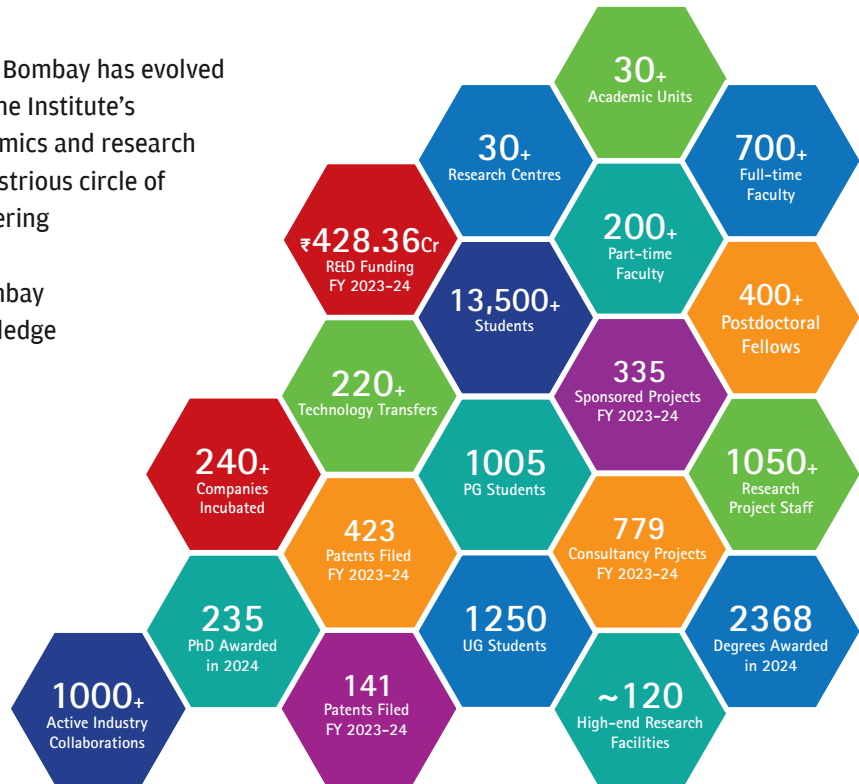
Mr. S. Somnath, ISRO Chairman visits TechConnect Exhibition of IIT Bombay



RF receiver chip 'Dhruva' receives KPIT Shodh Ground Breaking Research Award 2024

R&D at IIT Bombay

Research and Development (R&D) at IIT Bombay has evolved and flourished over the decades since the Institute's inception in 1958. The synergy of academics and research has catapulted the Institute into the illustrious circle of world-class institutions. Apart from offering viable solutions to various government sectors, industry and to society, IIT Bombay pursues basic research leading to knowledge generation that lays the foundation for empowering India as a nation to be technologically confident and self-reliant.



R & D Funding

New R&D projects, both short term consulting and longer term sponsored research, are initiated every year in all the areas of science, engineering, management, design and social sciences. Duration of the projects typically ranges from 2-5 years. Funding received for R&D activity in **FY 2023-24** is **₹ 428.36 crores**. This includes grants received for newly sanctioned as well as ongoing projects.

Intellectual Property

Period 1.1.1997 to 1.11.2024

- Patents Filed (Indian + Foreign + PCT): 1518 + 239 + 149
- Patents Granted (Indian + Foreign): 1169 + 141
- Designs (Filed + Registered): 121 + 100
- Copyrights (Filed + Registered): 36 + 24
- Trademarks (Filed + Registered): 304 + 229

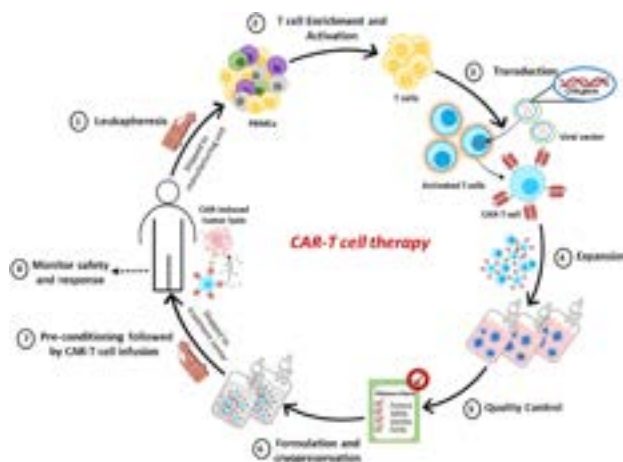
R & D Receipts

R&D Receipts (FY 2019-2024)



R&D Glimpses

IIT Bombay has made concerted efforts to align its R&D focus with the national goal of achieving technological self-reliance. Students and faculty members conduct research projects in all areas of science, engineering, design, management and humanities. The Institute has ongoing academic and research collaborations with many national and international universities, government institutions, PSUs and private industries. These interactions aim to keep pace with expanding frontiers of knowledge and global developments and also continually work towards national needs. Its pre-eminent position at the cutting-edge of research is reflected in its impressive list of research projects and their outcome.



NexCAR19: Cutting-edge CAR-T cancer therapy



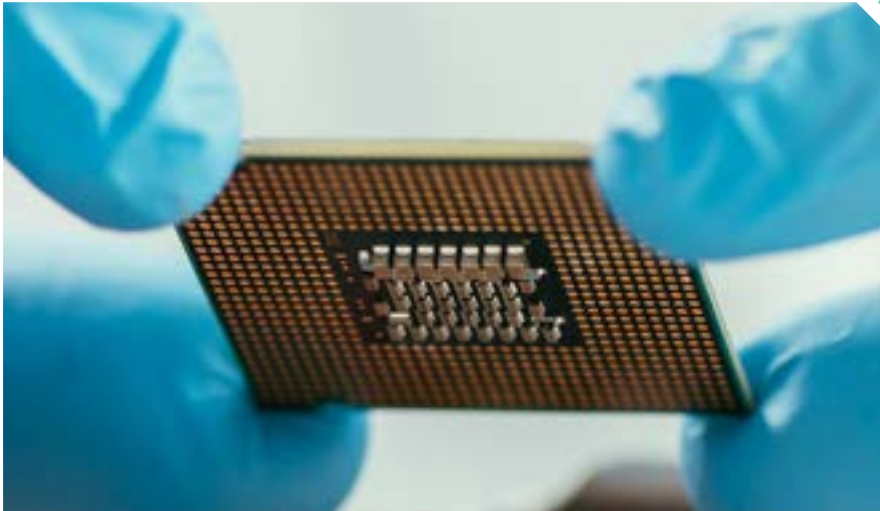
Indigenous anti-cancer CAR-T cell therapy dedicated to the nation



LTCC cold plates: Efficient alternative to cool supercomputers

▪ **Cutting-edge CAR-T cancer therapy (NexCAR19) at 1/10th the cost:** India's first home-grown anti-Cancer CAR-T cell therapy; Long-term and low-cost novel indigenous gene therapy where the Chimeric Antigen Receptor-T cell genetically engineers the patient's 'own' immune cells to recognize and kill cancer cells; one of the most effective treatments for treating blood cancer; developed in collaboration with Tata Memorial Hospital and ImmunoAct; CDSCO approval received for the treatment of relapsed/refractory B-cell lymphomas and leukemia; launched and dedicated it to the Nation by the President of India

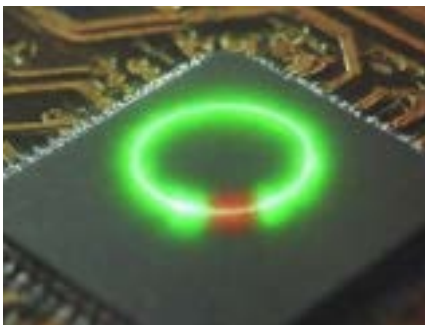
▪ **Low-temperature co-fired ceramic (LTCC) cold plates:** Efficient alternative to the conventionally used copper for making cold plates; currently tailored for 200 W processor range, they can effectively cool microprocessor chips in supercomputers; study demonstrates that microfluidic channels can be created in an LTCC package to form a cold plate; the proof-of-concept demonstration is a breakthrough finding that paves the way for integrating cooling solutions directly into the chip package



Quantum diamond microchip imager

- **India's first quantum diamond microchip imager:** An advanced sensing tool for semiconductor chip imaging that will help reduce chances of chip failures and improve efficiency of electronic devices; collaboration with industry to develop a quantum imaging platform for the non-destructive examination of chips; project aligned with the Government of India's National Quantum Mission - an initiative to position the nation as a global quantum technology leader

- **Novel method using silicon nitride (SiN) to optimize photonic technology:** Enhances the efficiency of photonic elements promising faster, more secure, and energy-efficient technologies for communication and information processing; research holds promise for several real-world applications like quantum computing, secure communications, and quantum sensing



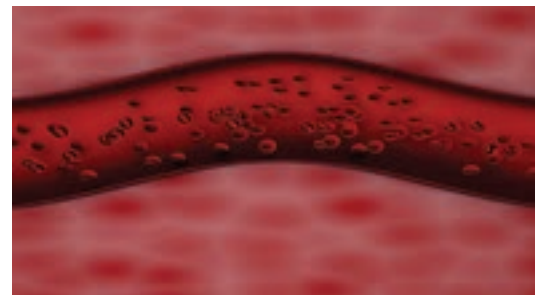
Silicon nitride to optimize photonic technology

- **Boron's microscopic behaviour for next-gen superalloys:** Study provides new insights on borides in nickel superalloys for enhanced high temperature performance; crucial for optimising the microstructure and enhancing the alloys' ability to withstand high temperatures; applicable in industries like aviation and energy where superalloys have widespread application, particularly in high-stress, high-temperature environments

- **Compact and portable microfluidics device:** Easy to use point-of-care device to rapidly measure the stiffness of human blood cells; uses a tiny microfluidic chip and a portable optical microscope; helps investigate the relation between stiffness and disease condition in blood samples of patients with sickle cell disease or malaria; can also be used to quickly assess stored blood before transfusion, ensuring that compromised blood is not used; an analysis software scans the video captured by the microscope, providing a distribution of RBC stiffness in the sample



Boron's microscopic behaviour for next-gen superalloys



Microfluidics device to measure stiffness of blood cells



Novel optimization methodology to find optimum size for fuel cell EV components



Novel algorithms improve cooperation among autonomous robots



Novel thermal insulating coating material for heat shielding and corrosion

▪ **Optimized sizing methodology for fuel cell electric vehicle (FCEV) components:**

Thermal management system comprising a compact radiator and a thermal energy storage unit to address the issue of 'oversized radiators' aids in the design of more efficient and cost-effective cooling systems in automobiles; the method optimizes the weight, cost and range of FCEVs by determining the optimally required radiator size in the vehicles; can help manufacturers choose the best solution possible based on whether they want a low-cost vehicle with minimal range and power or a high-cost vehicle with higher range and power; allows a reduction of radiator size in heavy-duty vehicles like trucks by almost 2.5 times lower than normal by optimizing the sizes of the parts

▪ **Low-power artificial neurons capable of obstacle detection:**

Significant advancement in the field of neuromorphic engineering and autonomous robotics using 2D materials in the development of low-power spiking neuron circuits; research findings can potentially revolutionize obstacle detection and avoidance, paving the way for further exploration and their integration into real-world applications

▪ **Advanced algorithms for improved autonomous robot cooperation:**

Innovative technique that improves the efficiency of robots by helping them communicate with each other in a more efficient manner; three novel algorithms allow real-time monitoring and dynamic task allocation, ensuring a balanced workflow where each robot contributes according to its ability, leading to an overall boost in productivity; also, significantly reduces the computation time of the robots by 85%; new method tested on two well-known industrial robots demonstrated that the new algorithm was much faster at performing tasks than conventionally used algorithms

▪ **Novel thermal insulating coating material for record heat shielding:**

Advanced surface coating that reduces the temperature by 21°C; water-repelling epoxy composite coating reduces heat conduction and imparts high infrared reflectance in a thin coating of ~65 micrometres; can effectively reflect the sun's heat and reduce the amount of heat absorbed by the material, providing thermal insulation; the prepared 'active additives' called fillers can be added to a suitable resin to make a temperature shielding coating; this innovative coating also protects against corrosion, making it an ideal solution for cooling living spaces



Minimally intrusive passive assistive device for the elderly

▪ **Minimally Intrusive Passive Assistive Device (MIHELP):** A mobility aid specifically designed for elderly individuals; offers a simpler and less complex alternative to existing assistive devices; the design allows for easy adjustment of pre-stress in the springs, enabling the device to provide near-optimal support tailored to the user's unique anthropometric and gait characteristics, ensuring effective mobility assistance while maintaining comfort and ease of use

▪ **Ship trajectory prediction tool for disabled ships and floating objects:** Aimed at advancing maritime safety, and facilitating early warnings and rescue operation planning; prediction tool enables quick response for locating the drifting vessels, as well as rerouting nearby vessels; collaborative project with Indian Register of Shipping (IRS) to create a computer program with automated report generation capabilities, intended for integration into existing IRS Emergency Response System (ERS) software programs; aims to develop 'Made in India' software system and will enhance maritime safety, rescue and support operations

▪ **Next-generation alkali metal-ion batteries:** Cutting-edge advancements in battery technology with high-voltage, electrochemically stable, and water resistant transition metal oxide-based cathode materials; High sodium containing high performance P2-structured 'layered' sodium transition metal oxide based cathode developed for Na-ion batteries; and Silicon nanostructures on copper developed for application as anode in Li-ion battery; both technologies honored with the prestigious BPCL Innovation Award

▪ **Oral Reading Fluency Tool (TARA):** Cutting-edge mobile app that automatically measures oral reading fluency (ORF) using advanced speech processing and machine learning; with just an audio recording of a child reading aloud, TARA (Teacher's Assistant for Reading Assessment) evaluates key ORF rubrics such as accuracy, pace, and expressiveness; adopted by Kendriya Vidyalaya schools for English and Hindi ORF assessment across Grades 3-8, covering over 7 lakh students in 1200 schools, making it the largest initiative of its kind in India

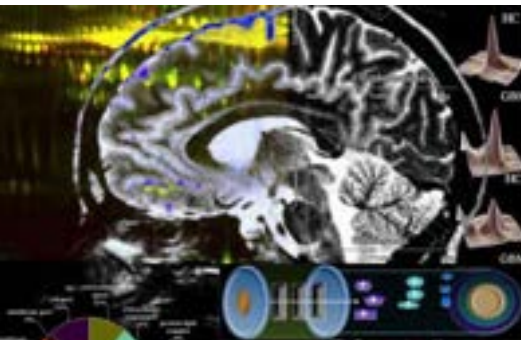
▪ **Portable, cost-efficient diagnostic device for pregnancy care (BIO-CHEQ):** Innovative device designed for on-the-spot, hassle-free testing that simplifies essential antenatal diagnostics; convenient, patient-side technology significantly reduces the turnaround time for results, enabling timely interventions in pregnancy care; offering a one-stop solution for both healthcare providers and patients, BIO-CHEQ ensures comprehensive monitoring of pregnancy status during a single visit; enhances accessibility, streamlines the care process, and ensures a more efficient approach to prenatal health management



BIO-CHEQ: Portable diagnostic device for pregnancy care



Sustainable waste disposal in the healthcare sector in India



Blood proteins to detect brain tumours

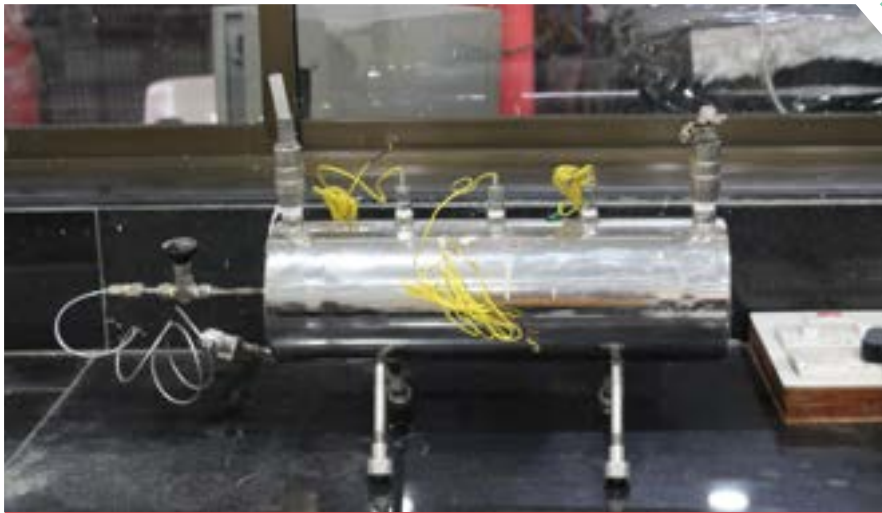


SAFE: Smart Authenticated Fast Exams



Cutting-edge solution for early detection of Parkinson's Disease

- **Analytical study for sustainable healthcare waste disposal:** Identifies key factors essential for successful adoption and effective implementation of a circular economy model (reduce-reuse-recycle approach) for healthcare waste management in India; 17 relevant and adequate factors called critical success factors (CSFs) have been identified under five broad areas of impact called 'implication dimensions' like research and development, education and social behaviour, economic facets, responsibility, and tracking mechanism; CSFs denote the actual activities to which the efforts can be allocated, and they include factors related to estimation, design, training, awareness, budget, responsibility, transparency, etc.
- **Blood proteins to detect brain tumours:** Glioma, the most aggressive of all grades of a type of brain tumour, can be detected by the analysis of proteins in blood serum, resulting in better treatment and hence better outcomes; study using protein chips containing 17,000 human proteins to identify protein autoantibody markers; the research represents an advance in the method of detection of GBM (Glioblastoma Multiforme) which is the fourth stage of glioma
- **Early detection of Parkinson's Disease:** Cutting-edge solution using advanced mathematical analysis techniques like K-means clustering and Dynamic Time Warping (DTW), to analyze walking patterns; unique, identifiable features for each individual being tested are extracted by organizing data into clusters; These features are then processed through a logistic regression model, offering a simple yet highly effective method to detect early PD symptoms, something conventional statistical methods often struggle to achieve; novel algorithm ensures personalized analysis, as feature extraction is performed separately for each subject, minimizing the impact of variations in walking style or speed, and enhancing detection accuracy
- **Smart Authenticated Fast Exams (SAFE):** App for a smart classroom of the future; transforms the conduct of exams in proctored venues and eliminates the tedious process of manual evaluation; paper-free and cheating-free; potential use cases include quick, proxy free attendance; continuous assessment through short quizzes; online correction of regular subjective exams; conducting easy, paper-free objective exams; conduct surveys and polls



Metal hydride H₂ storage systems

■ **Metal hydride based hydrogen storage systems and solutions:**

Alternative reliable, safe, inexpensive and long-term solution for various applications charged at lower pressure; different scale of reactors developed, tested and integrated; capable of storing 35-700g of H₂ at 30 bar H₂ pressure and ambient temperature; applications include power laboratories, 2-wheeler vehicles, and thermal energy storage; the only clean solution with a range (>500 km) and very low refueling time (<5mins) as compared to a battery, in the vehicular segment

■ **Next-generation optoelectronic materials for solar cells and display technologies:**

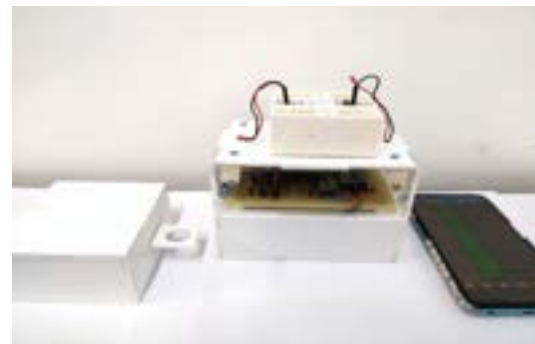
Uses high-performing unconventional materials like halide perovskites / organic semiconductors; create solar cells that more efficiently generate energy, lighting or display than existing ones

■ **Bahubhaashak:** Technology for speech-to-speech machine translation for education in Indian languages; enables speech-to-speech translation, ease of learning in local languages; dramatically reduces time for making lectures available in Indian languages; can be scaled to school education; promising solution for imparting quality school education in rural India

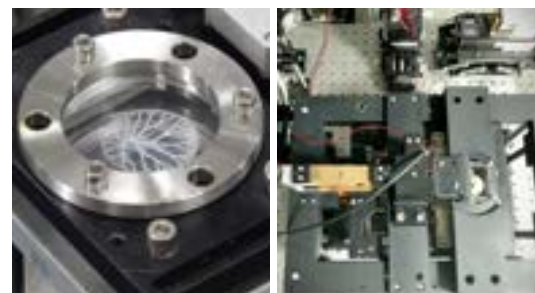
■ **Treated refinery wastewater naturally purifies through sand with pollutant-eating bacteria:** Easy, accessible solution for industrial plants worldwide; sand biofilters form biofilms that remove harmful compounds from water; designed biofilter contains a column of pure quartz sand, providing a surface for bacteria to attach and thrive; bacteria adhere to sand grains, multiply, and secrete substances to create biofilms as water flows through the sand bed; using dissolved oxygen, organic carbon, and nutrients, the biofilm breaks down organic contaminants, further purifying the water

■ **Novel method for plasma extraction from blood droplet:** Indigenous, low-cost, user-friendly, commercially viable, high yield and robust blood plasma separation device; can be integrated into plate reader/ fluorescence-based camera for detection of disease biomarkers in field diagnostics; technology uses sphere-on-flat geometry in a lifted Hele-Shaw cell for recycled surface blood flow over a filtration membrane; plasma quality indicates suitability for detection of TSH biomarker

■ **Low-cost portable DNA sensor for wastewater disease surveillance:** Aids in early detection of viral and bacterial pathogens in sewers and water bodies; device functions by detecting colour changes created by the interaction of DNA with methylene blue (MB) dye; mobile app developed can read this voltage signal via bluetooth and display the information on a smartphone



Portable DNA sensor for wastewater disease surveillance



Plasma extraction from blood droplet

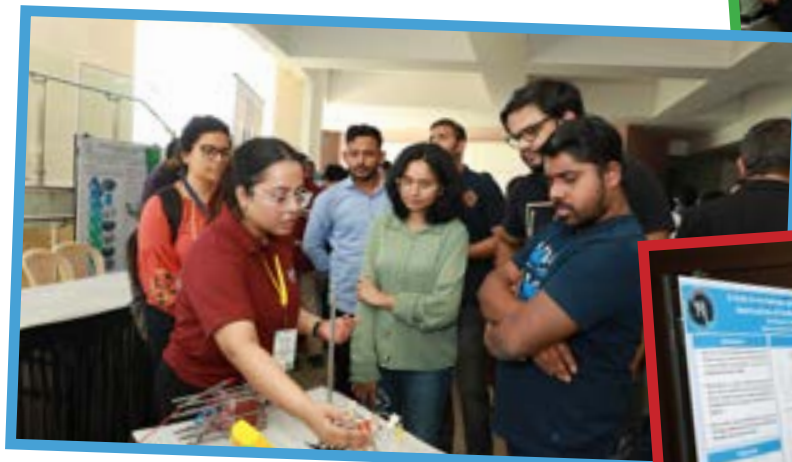
ICONS 2024: IITB Hydrogen Workshop

IIT Bombay hosted the 5th edition of its annual event, IRCC Conferences on Emerging Concepts (ICONS), focusing on hydrogen technology.

Held on February 16-17, 2024, the two-day workshop highlighted cutting-edge developments in hydrogen generation, storage, transportation, and application. The event featured a distinguished line-up of speakers which included Mr. Lalit Bohra, Joint Secretary, MNRE; Dr. V. K. Saraswat, Member, NITI Aayog & former DRDO Secretary; and Dr. Anita Gupta, Head of Scientific Divisions, DST.

Key topics covered included advanced hydrogen production techniques such as water electrolysis, biomass gasification, and emerging methods like photoelectrochemical and photobiological processes. Experts also discussed critical factors such as cost, efficiency, safety, infrastructure, and the environmental impact of hydrogen technologies.

This event acted as a vibrant platform for collaboration, bringing together experts, researchers, and policy influencers from around the world to exchange ideas and insights into the future of hydrogen.



Industry Day on Digitization

Bridging Academia and Industry at IIT Bombay



The Office of Dean R&D organized the 'Industry Day on Digitization' as part of National Technology Day celebrations on May 11, 2024.

The event fostered collaboration between academia and industry, with 60 participants including researchers, industry experts, and faculty.

Sessions throughout the day featured presentations on digitization advancements in IoT, smart manufacturing, robotics, and security, along with real-world applications and successful industry collaborations. Participants also toured the Institute's cutting-edge labs, witnessing innovative research in action.

The event highlighted IIT Bombay's leadership in digitization and opened opportunities for future partnerships in emerging technologies.

Industry Partnership

Active Industry Collaborations

1000+

Ongoing Industry Projects

1000+



MoU with Samsung R&D for advancing AI research



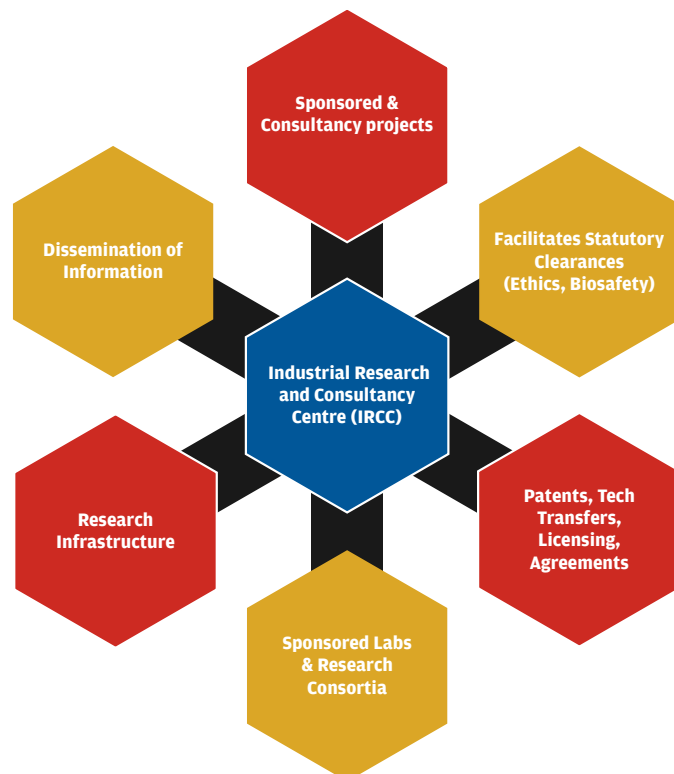
Collaboration with Military Institute of Technology, Pune

Benefits

- Access to fresh ideas, innovation and talented student base
- Knowledge creation, technology & HR development
- Access to high-end equipment and other resources
- Facilitating processes and systems for collaboration
- Complementary skills and capabilities upgradation
- Access to qualified personnel for recruitment
- Multidisciplinary research pool
- Access to new technologies
- Leverage public funding

R&D Projects at IIT Bombay

Industrial Research and Consultancy Centre (IRCC) at the Office of the Dean (R&D) is the nodal unit responsible for managing and coordinating all activities related to research and development at the Institute. It has streamlined processes for financial, manpower and intellectual property management. IRCC has also initiated many schemes for incentivising and supporting researchers. It facilitates interactions with various external agencies for funding and licensing activities.



Modes of Collaboration

Consultancy Projects

- Short term projects to solve specific problems of industry
- Scope of work and deliverables are well defined

Sponsored R&D Projects

- Long term projects for new knowledge generation in current, emerging and futuristic areas
- Deliverables may include IP generation, manpower development and publications

Research Cell for Collaborative projects

- Fairly long term research collaboration in broadly defined areas of mutual interest to industry and IIT Bombay
- Multiple research projects to be executed by IIT Bombay faculty with industry feedback
- Industry can define problem statements, collaborate on the projects, receive ownership for IPs and commercially exploit new technologies

Sponsored Research Laboratories at IIT Bombay

- Research facility / laboratory sponsored by an industry in an area of interest, helping build the infrastructure at IIT Bombay. Such facilities and laboratories will be shared with the sponsoring industry and may also be open to others on a case-to-case basis.



IITB partners with Government of Maharashtra (GoM) for technology driven solutions



Streaming Analytics over Temporal Variables from Air quality Monitoring (SATVAM)

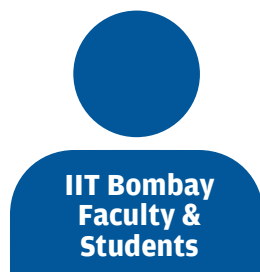


INOX Cryogenic Research Lab

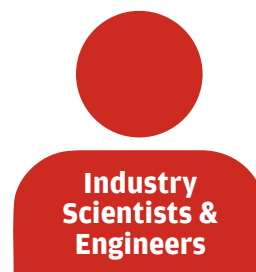
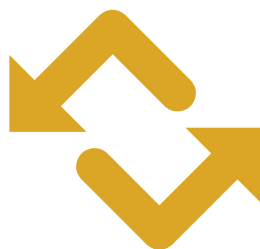


Deepak and Maya Satwalekar Design & Making Lab

Exchange Visits



**IIT Bombay
Faculty &
Students**



**Industry
Scientists &
Engineers**

IIT Bombay faculty at Industry

Sabbatical like visit

- May, June, December
- Primarily for ice breaking:
 - » Interact with R&D staff
 - » Seminar / lecture
 - » Site tour
- Not for consultancy

Other types of visits

- Any time of the year
- Customise
 - » Frequency of visit
 - » Duration of visit
 - » Scope of work

Industry personnel at IIT Bombay

- Frequency / duration flexible
- NDA prior to visit
- Industry responsibility
 - » Health / accident insurance
 - » Salary / remuneration
 - » Accommodation / transport

Student Internship

- Credit based internship
 - » In a core industry
 - » Faculty mentor from IIT Bombay
- Non-credit based internship



IIT Bombay students on a visit to United Phosphorous Limited

Industry Sponsorships and Fellowships at IIT Bombay

2+1 Year MTech model:

Year 1	Course Work
Year 2	MTech project working on a research problem identified by Industry Student will graduate with MTech degree
Year 3	Continue to complete project work at IITB or field

Industry Sponsorship / Fellowship

Program	Duration	Amount (in ₹)
Post-Doctoral Fellow	Variable	55,000 - 85,000 per month (+ HRA as applicable)
PhD	5 years	23,00,000 + HRA as applicable (as per Visvesvaraya PhD Scheme)
MTech (2+1 Year Model)	2 years (Year 2 & 3)	13,00,000 (higher funding for Year 3 due to out of campus expenses)
Masters	2 years	7,00,000

CEP Outreach

With the rapid pace of growth in science and technology and frequent paradigm shifts in policy, governance and management, continuing education of working professionals is a vital need for development.

The Executive Education (Exec-Ed) office at IIT Bombay has been set up to meet the knowledge upgrading and upskilling needs of working professionals in the S&T industry, academia and governance.



Variety of programmes offered through Exec-Ed have been fulfilling the wide spectrum of continuing and executive educational needs of working professionals from diverse disciplines, and we justifiably take pride in the fact that it is one of the most sought after continuing education centres within the country.
www.cep.iitb.ac.in

Chair Professorship

Being appointed to an endowed chair is one of the highest honors awarded in the academic arena and is reserved for the top faculty members at IIT Bombay as an acknowledgment of their signal contributions in research and teaching.

The prestige of an endowed chair also lends an additional cachet to the departments. It helps to attract the best and brightest young students and investigators thus securing the future of the institution.

Chairs have been established with generous donations from alumni and other friends of the Institute. In addition, IIT Bombay has also created Institute Chairs.

~50 Chairs established.

TATA Chair
Inani Chair
P. K. Kelkar Chair
Ramkrishna Bajaj Chair
Kamalnayan Bajaj Chair
Romesh Wadhvani Chair
Google Cloud Chair
Bajaj Group Chair
D. L. Shah Chair
Pramod Chaudhari Chair
L&T Chair
Madhuri Sinha Chair
G.K. Devarajulu Chair
SUBRAO M. NILEKANI CHAIR
Maharashtra Pollution Control Board
Biswas-Palepu Chair
HAL R&D Chair
Forbes Marshall Chair
N.R. Kamath Chair
Praj Industries Chair
Vijay and Sita Vashee Chair
Bank of Baroda Chair
Rahul Bajaj Chair



Consortia and Centres of Excellence at IIT Bombay



Centre for Machine Intelligence and Data Science (C-MInDS)

Set up to nurture talent pool in artificial intelligence, data science, and related areas in different application domains



National Centre of Excellence in Carbon Capture and Utilization (NCoE-CCU)

Hub for state-of-the-art research and application-oriented initiatives to accelerate efforts towards carbon dioxide capture, compression, transport, and utilization in enhanced hydrocarbon recovery as co-benefit pathways

Funded by DST, GoI



Centre of Excellence in Smart Drone and Integrated Mobility Systems

For R&D, manufacturing, testing, and training; ₹151.8 Cr sanctioned over 5 years for the Maharashtra Drone Mission (MDM) to advance drone technology in surveillance, disaster relief, remote healthcare, infrastructure monitoring, and traffic management; permission granted by Ministry of Civil Aviation for usage of drones on IITB premises



Centre of Excellence in Oil, Gas, and Energy (CoE-OGE)

To provide a competitive advantage to India's oil and gas sector by identifying indigenous solutions and energy resources to cater the challenges faced

Funded by India's seven blue-chip oil firms including IOCL, BPCL, HPCL, GAIL, ONGC, EIL & OIL



Center for Semiconductor Technologies (SemiX)

Enables semiconductor industry focussed R&D, workforce development and entrepreneurship by serving as a common interdisciplinary platform to integrate the energies of multiple involved academic disciplines, Indian semiconductor consumers and creators, academicians, entrepreneurs, investors, and government policy makers; center leverages the strong knowledge and outreach networks already established at the institute; nodal point to facilitate semiconductor related R&D, training, translation, incubation, and formulation of policy inputs



Centre of Excellence in Steel Technology (CoEST)

For R&D in steel technology and creation of high quality manpower for the industry

Funded by Ministry of Steel, GoI



Koita Centre for Digital Health (KCDH)

Set up under the aegis of the Koita Foundation; research focus areas are clinical applications (including electronic patient records and medical imaging), healthcare data management (including data privacy and security), healthcare analytics, healthcare AI/ML, consumer health, public health and public policy



Nanoelectronics Network for Research and Application (NNetRA)

Initiative by Ministry of Electronics & Information Technology (MeitY) to push the frontiers of nanoelectronics through basic research in this field; to engage in nano electronic device and system



Quantum Information Computing Science & Technology (QuICST)

Hub for quantum science and technology research and education; research activities span over all four verticals namely computation, communication, sensing and materials; aided by state-of-the-art nanofabrication and measurement facilities, and strong support from quantum theory groups



Sunita Sanghi Centre of Ageing and Neurodegenerative Diseases (SCAN)

Aimed towards developing tech solutions for timely detection and treatment of neurodegenerative disorders in the elderly; Envisions creating novel tools and biomarkers for Parkinson’s, Alzheimer’s and Frontotemporal Dementia; Thrust areas include understanding disease mechanisms, diagnosis, devices and policy studies



National Centre for Photovoltaic Research and Education (NCPRE)

Provides R&D and educational support for India’s ambitious 100 GW solar mission

Funded by MNRE, GoI



IITB Trust Lab

Envisions strengthening the country’s digital environment, making it more trustworthy, and working towards a secure and responsible Digital India; enabling world-class research and collaborations, through research grants and specialized activities; revolutionizing digital trust education in India through trustnet; identifying and executing high-impact development projects; outreach activities; seeding and nurturing technology start-ups



Medical Engineering Design & Innovation Centre (MEDIC)

Aims to develop cost-effective, portable and highly accurate biomedical devices with real-time monitoring for the rural and urban areas of India; focus areas include maternal & child health, biomedical devices, orthopedic care, cardiac care, drug delivery, physician assistance, biosensors, psychotherapeutics, ageing health & care product



Photovoltaic Technology and Innovation Center (PoTIC)

Set up to effectively work with industry and alumni to meaningfully contribute to the country’s PV missions; builds on the expertise developed through NCPRE and other national and international projects at the Institute



Desai Sethi Centre for Entrepreneurship (DSSE)

Trains aspiring entrepreneurs through courses and pre-incubation programs at IITB; courses in innovation and entrepreneurship either as electives or pursued as a minor in entrepreneurship; interactive and experiential pedagogy based on concept-based class discussions, field assignments and team projects, guest entrepreneurs and case studies; pre-incubation programs wherein students receive grants, access to facilities for working on prototypes and mentoring for developing their business model



Wadhvani Research Centre for Bioengineering (WRCB)

Inter-departmental virtual centre focusing on technology translation in the broad domain of healthcare delivery, with emphasis on technology innovation and commercialisation



Biomedical Engineering and Technology Innovation Centre (BETIC)

Integrated facilities for design, analysis, prototyping and testing of medical devices

Funded by DST & Maharashtra Govt.



Technocraft Centre for Applied Artificial Intelligence (TCA2I)

To foster collaboration in applied Artificial Intelligence (AI) through research and outreach, using the expertise of faculty in AI, decision sciences, machine learning and optimisation



SBI Foundation Hub for Data Science and Analytics

Specifically designed to address the unique challenges faced by the Indian banking and financial services sector by applying Data Science and AI principles; pivotal role in stimulating innovation within the digital banking realm and promoting research in emerging fintech domains; competency building and bolstering skillsets; outreach initiatives that will augment and broaden the community of professionals skilled in banking analytics



Take it easy!

HDFC Ergo-IITB Innovation Lab

Aimed at operationalizing high-impact projects across the insurance value chain and developing solutions to relevant business challenges; first centre in the insurance sector to provide long-term strategic business solutions by leveraging the startups at DSSE and SINE; 50 high impact projects to be funded over 5 years across business verticals like acquisition, servicing, claims, renewal, underwriting actuarial practices and operations



Bank of Baroda IIT Bombay Innovation Centre

Foster innovations in the financial hardware space and contribute to bank's digital strategy; be the fountainhead of Innovation for the entire BoB group including capital markets, asset management, insurance, shared services, etc; aims to create cutting edge technology such as analytics to forecast cash replenishment rates at ATM centres, PoS machines with value added services



MoU signing with JSW Steel to set up the JSW Technology Hub

JSW Technology Hub

First-of-its-kind, state-of-the-art technology hub for research in steel manufacturing in India; joint research and training projects with JSW Steel to develop patented industrial applications and solutions, with enhanced focus on research and education on new and emerging technologies



IITB-FedEx Centre for Advanced Logistics & Analytics

Partnership with FedEx Express to develop innovative technologies addressing key logistics and supply chain challenges; Centre will focus on reducing cost and enhancing operational efficiency using advanced quantitative models and solution technologies in supply chain network design and planning; the collaboration will leverage the institute's research expertise and its robust entrepreneurial ecosystem to support the development of technologies and the creation of a highly skilled talent pool



DeSaltM

Established with the aim of developing state-of-the-art technologies with five IITs: IITB, IITD, IITKGP, IITT & IITH and other stakeholders from industries and NGOs to provide various desalination, brine management, and water recycling technologies; objectives include developing strategies and technologies for desalination, sustainable treatment, and reuse of water; translating water technologies based on the membrane using the resources, mechanisms and knowledge acquired; incubation and commercialization of developed technologies and products



DRDO-Industry-Academia Centre of Excellence (DIA-CoE)

To harness and synergize the combined strength of academia, student community, research fellows, niche technology industries and DRDO scientists to provide impetus to research and innovations in identified futuristic defence technological domains through multi-disciplinary and multi-institutional collaborative efforts; research verticals include aero engine (small turbo fan engine & large aero engine), solid propellant combustion modelling, morphing wing aircraft technology, and hypersonic propulsion

Ashank Desai
Centre for Policy Studies

Ashank Desai Centre for Policy Studies

Envisions to encourage a sustained dialogue between academia and other policy stakeholders in order to promote evidence informed and inclusive policy making and analysis, and create capacity for policy studies in India; offers Masters and PhD programmes with courses in policy theory and specific policy domains



Advanced Mechanical Testing Facility (AMTF)

State-of-the-art central facility to cater to the needs of fatigue testing ranging from 220N to 250kN load, -120°C to 1200°C temperature and uniaxial-torsional-planer biaxial loading; open to industries for use



Water Innovation Centre: Technology, Research and Education (WICTRE)

Aims at innovation through excellence in sustainable water purification technologies to solve water related problems for society

Funded by DST, GoI



National Centre for Aerospace Innovation and Research (NCAIR)

Aims to provide economically viable, sustainable solutions to Indian aerospace manufacturers

Founding members DST, IITB, Boeing, HAL and NAL



National Centre of Excellence in Technology for Internal Security (NCETIS)

Develop indigenous, state-of-the-art, self-sufficient technology solutions to address internal security challenges faced by Indian security forces and law enforcement agencies; capacity building for technology enabled policing; be a resource center for technology needs for internal security forces



IIT BOMBAY

Centre for Liberal Education

Centre for Liberal Education (CLE)

Facilitates interdisciplinary studies in the Liberal Arts, Sciences, and Engineering (LASE) program, enabling the freedom to specialise in ground breaking, cross-cutting fields such as AI and EdTech or healthcare engineering



Parimal and Pramod Chaudhari
Centre for Learning and Teaching

Parimal & Pramod Chaudhari Centre for Learning & Teaching

Aims to facilitate and support pedagogy by promoting innovation, evidence - based practices and collaboration; activities cover research in teaching & learning, development and assessment of academic programs & curriculum, development of teaching methods for large classes, teaching with technology & software, employing inclusive teaching strategies, etc.



Tata Centre for Technology and Design (TCTD)

Aims to develop solutions to challenges faced by resource constrained communities using an end-to-end innovation approach

Supported by Tata Trusts



10X GMP Facility

Established the nation's first-of-its-kind Good Manufacturing Practice (GMP) facility to translate research into tangible healthcare solutions; enables production of small batches for human trials; encourages researchers to create breakthrough products that are 10 times more affordable, efficient, or faster; aims to make complex disease treatments, like cancer, more affordable without compromising quality or efficacy; accelerates technology development and commercialization; facilitates a seamless transition from concept to market; redefines medical solutions and drives advancements in healthcare and biotechnology



C1973 EV Power Train Lab

Envisions transforming research and innovation in the EV space; serves as the core of all EV activities at the institute, focusing on small vehicle production; plays a pivotal role in manpower training through internal and professional programs; established through a generous contribution from the Class of 1973 to harness the expertise of IIT Bombay and innovators to lead the development of EV technology for light commercial vehicles; aims to be the preferred R&D source for Indian firms, driving innovation and global competitiveness



IITB Research Hub for Green Energy and Sustainability (GESH)

Dedicated to addressing the global climate crisis by facilitating technological, management and policy solutions through research in green energy and sustainability; committed to training the next generation of experts through interdisciplinary programs and hands-on research; focus areas include solar thermal and PV, batteries and fuel cells, biofuels, wind energy, green hydrogen, circular economy, climate change, environmental studies, food and water, and decarbonization; conducts sustainability assessments for industries and academic institutions; organizes training sessions and workshops in green energy and sustainability



IITB-Citadel Securities Quantitative Research Lab

To establish a research center for Financial Markets; will focus on diverse areas of finance, including the application of mathematical and statistical methods in finance and risk management, as well as technological innovations in banking and financial markets; will offer relevant academic programs for all students; will collaborate with banks and financial service companies to create tailored educational and research opportunities, providing students with real-world experience and the ability to contribute to the field



ABB Electrical Machines and Drives Lab

To establish a cutting-edge teaching laboratory for electrical machines and drives, aimed at providing students with hands-on training using modern, energy-efficient industrial equipment; lab to prepare students for fast-evolving energy and industrial sectors while promoting environmental sustainability; also aims to emulate industrial applications such as wind turbine generators and electric vehicle drivetrains, offering students a comprehensive understanding of modern energy systems



Gogri Hub for Membranes Research

Focuses on advancing membrane technologies for applications like water purification, gas separation, and biomedical use; drives the adoption of sustainable solutions aligned with global decarbonization efforts; serves as a hub for innovation in membrane science, leading both fundamental and applied research; develops cutting-edge solutions to enhance industrial efficiency and sustainability; fosters collaboration among academia, industry, and government to tackle challenges in clean water, energy, and healthcare; trains skilled professionals through interdisciplinary research and education; promotes knowledge exchange through workshops and seminars; aims to revolutionize membrane technology for clean water, healthcare, sustainable energy, and environmental protection

Models for IP Commercialisation

Collaborative development and licensing

- Joint ownership of IP
- First option for exclusive licensing
- IP ownership to industry on mutually agreed terms

Licensing of IP generated in the Institute

- IP generated through academic / unrestricted sponsored research
- Exclusive or non-exclusive license (preferred) offered to interested Industries

Incubation / Entrepreneurship

- Through Society for Innovation and Entrepreneurship (SINE), the technology business incubator of the institute
- IIT Bombay IP taken up in the start-up companies, promoted by faculty, students and alumni
- IP licensed to incubatee companies



N3IWF binary licensed for commercialization



Transfer of spherical robot to Alibi Global Pvt Ltd



Ultra-safe lithium-ion battery pack



Electroluminescence cameras to detect cracks in solar panels



Agitated thin film drying (ATFD) system for producing jaggery



Diabetic foot screening device



Floating solar photovoltaic system



Portable digital microscope

Technology Business Incubation

Society for Innovation and Entrepreneurship (SINE) is the technology business incubator at IITB set up in 2004. SINE supports technology startups founded by IITB community or that are based on IITB technologies, and extends the role of the institute by facilitating conversion of R&D into entrepreneurial ventures. Incubated companies cover a diverse spectrum of technology areas including healthcare, big data analysis, mobile apps, fintech, nanotech, biotech, clean-tech, social media, etc. www.sineitb.org

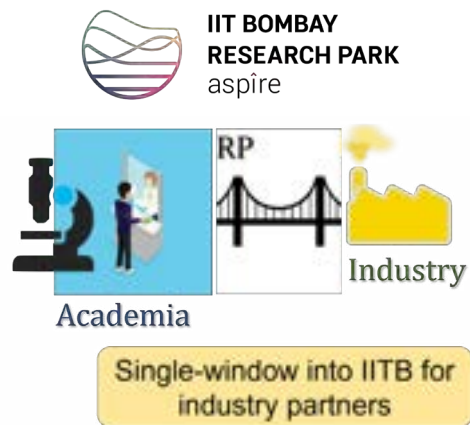


IIT Bombay Research Park Foundation

A not-for-profit arm of IIT Bombay registered as a Section 8 company, the IIT Bombay Research Park Foundation was established in 2014, with financial support from the Ministry of Human Resource Development, Govt. of India.

This Foundation provides an ecosystem wherein researchers from IIT Bombay and industry work in close collaboration with each other for product innovation, addressing technology challenges and in research areas of mutual interest.

Through this Foundation, IIT Bombay aims to collaborate with large, medium and small enterprises, technology startups and accelerators. The Foundation provides a mechanism for technology-focused companies to co-locate R&D personnel at IIT Bombay and seamless access to laboratories, research infrastructure and other research services. Industry R&D personnel can have close interaction with IIT Bombay faculty and student researchers. Several companies are partners currently. www.iitbresearchpark.com



Technology Innovation Hub for IoT & IoE

The TIH Foundation for translational research on IoT and IoE (TIH-IoT) is conceptualized by the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), and is being implemented by the Department of Science and Technology, GoI, in its quest for Industry 4.0 and related areas.

In order to leverage the strength of academia in innovation and to ensure proximity to captains of industry, the TIH-IoT is established as a Section 8 company (not-for-profit) at IIT Bombay.

The hub focuses on creating a self-sustained effort towards cutting-edge innovation through continuous research, leading to a robust ecosystem of entrepreneurship in advanced technology and innovation, backed by the brightest minds in the country. The goal is to help India become a leader in technology-led economic growth.

The multi-disciplinary technical verticals include: sensors & sensor network; low power & energy constrained devices; communication protocol & security; data analytics & machine learning; and real-time control, planning & estimation.



India's first multimodal large language model initiative: BharatGen, is a groundbreaking initiative in **Generative AI**. Led by IIT Bombay under DST's NM-ICPS, it aims to create high-quality text and multimodal content in Indian languages, celebrating the nation's linguistic and cultural diversity.

The project prioritizes multilingual, multimodal models built on India-centric datasets to ensure inclusivity and data sovereignty. Implemented by the TIH Foundation with collaboration from premier institutes, BharatGen is set to democratize AI access for startups, researchers, and industries.

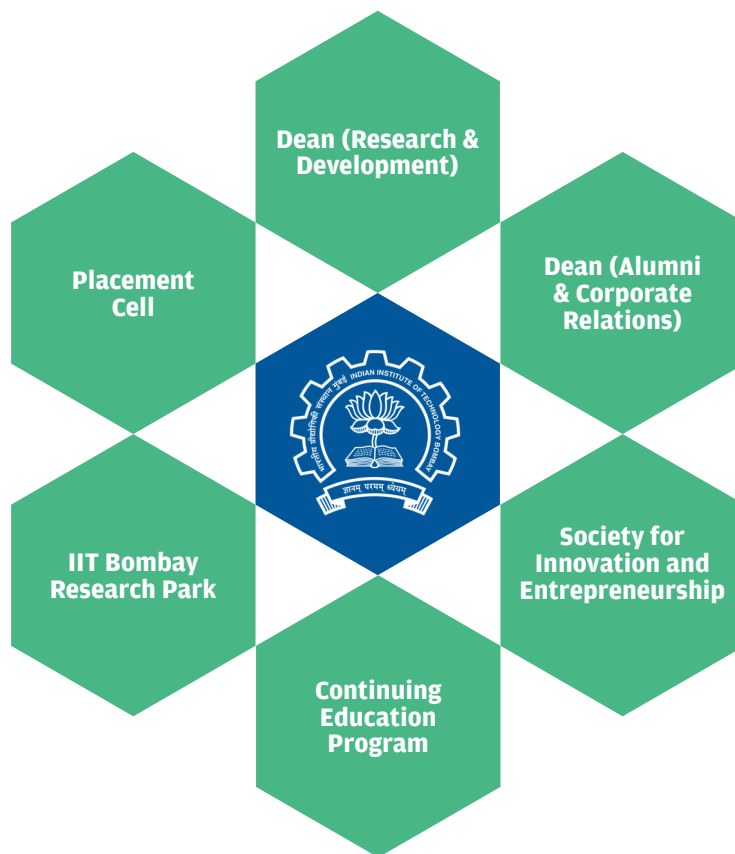
Aligned with national priorities, BharatGen will drive innovation, promote equity, and deliver AI solutions tailored to India's needs. By 2026, it aspires to set benchmarks, expand AI adoption, and establish India as a global leader in Generative AI.

Translational Research Centre (TRC)

Aims to create an ambience that will provide infrastructural support, enable the maturation of early-stage breakthrough innovations toward creating societal and industry impact, and address some of the critical challenges in the deep-tech area. The centre is expected to strongly support the existing innovation ecosystem, play a pivotal role in maturing the fountain of ideas emanating from academic research, and result in ripe technologies for commercialization.



Industry Interfaces at IIT Bombay



Society for Innovation and Entrepreneurship (SINE)

Technology business incubator which provides 'start to scale' support

Platform to foster entrepreneurship and nurture tech start-ups



pic.sine@iitb.ac.in

Tel: +91 22 2576 7016

www.sineiitb.org

IIT Bombay Research Park

Facilitates establishment of an innovation hub inside IIT Bombay through industry - academia collaboration

Joint IIT Bombay - Industry Research & Development groups for stronger impact



info@iitbresearchpark.com

Tel: +91 22 2572 0292

www.iitbresearchpark.com

Continuing Education Program (CEP)

Assists working professionals in widening their knowledge base and improving their skills

Single point contact for all courses and industry specific programs



pic-cep@iitb.ac.in

Tel: +91 22 2576 7006

www.cep.iitb.ac.in

Dean (Research and Development)

Create and maintain an environment, including research infrastructure and support staff for R&D

Facilitate collaboration, both within and outside the Institute

Liaise with funding agencies and industry, provide support for MoUs and agreements

Exploit IIT Bombay R&D through licensing and commercialisation

Provide administrative support for R&D at the Institute



dean.rnd@iitb.ac.in
Tel: + 91 22 25767039
www.rnd.iitb.ac.in



Dean (Alumni and Corporate Relations)

Promote and strengthen engagement with the Alumni and Corporations

Manage utilisation and enhancement of the Institute's endowments and gifts from well-wishers



dean.acr@iitb.ac.in
Tel: +91 22 2576 7023
www.alumni.acr.iitb.ac.in

IIT Bombay Placement Office

Responsible for campus placement, student internships at IIT Bombay

Excellent infrastructure and student volunteer teams to coordinate activities



pic.placement@iitb.ac.in
Tel: +91 22 22576 7092
www.campus.placements.iitb.ac.in

Dean (Academic Programs)

Course curriculum, academic programs

Student sponsorships and fellowships



dean.ap@iitb.ac.in
Tel: +91 22 2576 7049
www.iitb.ac.in/acad

Technology Innovation Hub for IoT & IoE

Drives IoT and IoE innovation through research and collaboration with academia, industry, and government

Supports startups and SMEs with funding, mentorship, and infrastructure in IoT/IoE

Develops IoT/IoE technologies in healthcare, smart cities, agriculture, transport, and energy

Provides specialized training to build a skilled workforce in cyber-physical systems

Collaborates with national and global partners for knowledge sharing and tech transfer



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Research Facilities

▼ Laser Scanner Microscope Facility



▼ Coating Machine for Battery Prototyping



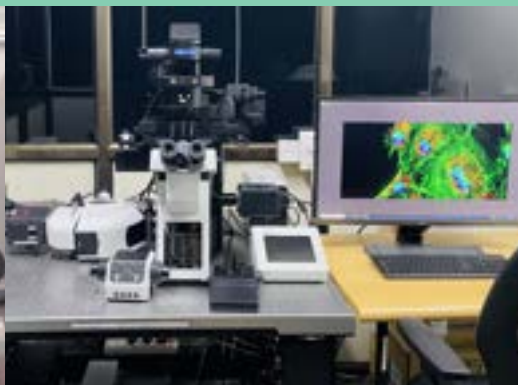
▼ Liquid Helium Plant and Nitrogen Plant



▼ Protein Crystallography Facility



▼ High Throughput Imaging Facility



▼ Spinning Disc Confocal Facility



▼ Liquid Chromatography High Resolution Mass Spectrometer



▼ High Resolution X-Ray Diffractometer



▼ Cryo FEG Scanning Electron Microscope



▼ 750 MHz NMR Spectrometer



▼ Electrochemical Capacitance Voltage Dopant Profiler



▼ Lattice Light Sheet Microscopy Facility



Student Initiatives

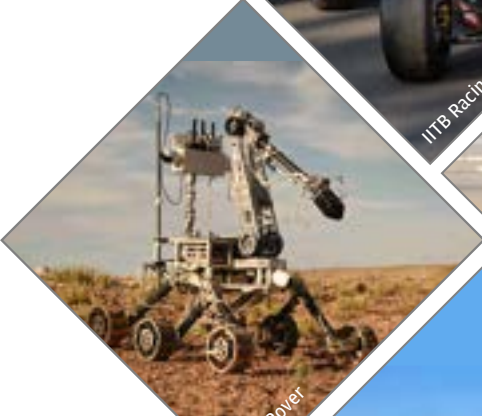


ITB Racing



ASME

Solar Decathlon



Mars Rover



MAY



ITB Rocket Team



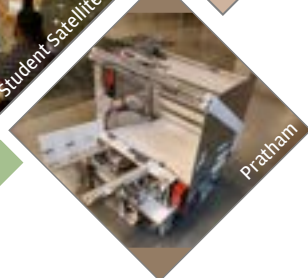
AeroVe



Thenopod GenSUS



Student Satellite Team



Pratham

The Industrial Research and Consultancy Centre (IRCC)

IRCC was established in 1975 as the nodal unit responsible for managing and coordinating all activities related to research and development at the Institute, including facilitating interactions with industries and government agencies, setting up simplified processes for financial, manpower and intellectual property management, licensing activities and schemes for incentivising and supporting researchers.



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