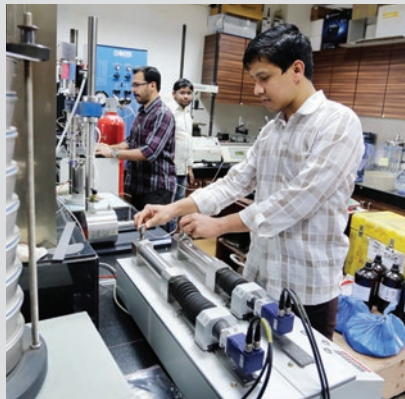भारतीय प्रौद्योगिक संस्थान मुंबई
INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

ANNUAL REPORT
2022-23

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Mumbai - 400076

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Additional Secretary,
Ministry of Education (TE),
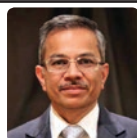118-C, Shastri Bhawan,
New Delhi - 110015

Prof. Aniruddha B. Pandit
U.G.C. Professor,
Department of Chemical Engineering,
Institute of Chemical Technology Bombay,
Matunga, Mumbai - 400019

Prof. Paresh K. Joshi,
NIUS Building,
Homi Bhabha Centre for Science Education,
TIFR, V.N. Purav Marg, Mankhurd,
Mumbai - 400088

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Higher and Technical Education,
Government of Maharashtra, Mantralaya, Mumbai - 400032

Shri Praful K. Patel
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U.T. of Daman & Diu and Dadra and Nagar Haveli,
Silvasa – 396 230

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Environmental Science and Engineering Department,
IIT Bombay, Mumbai - 400076

Prof. Narayan Rangaraj
Industrial Engineering and Operations Research (IEOR),
IIT Bombay, Mumbai – 400076

Secretary

Mr. Ganesh Bhorkade
Registrar, IIT Bombay
Powai, Mumbai - 400076

CONTENT

By
Prof. Subhasis Chaudhuri
Director, IIT Bombay

> ❝
> The progress of
> IIT Bombay on
> all fronts has been
> creditable in the
> past year ❞

OPENING REMARK

Indian Institute of Technology Bombay (IIT Bombay) has a rich tradition of pursuing excellence and has continually re-invented itself in terms of academic programmes and research infrastructure. Students are exposed to challenging, research-based academics and a host of sport, cultural and organizational activities on its vibrant campus. The presence of world-class research facilities, vigorous institute-industry collaborations, international exchange programmes, interdisciplinary research collaborations and industrial training opportunities help the students of IIT Bombay to excel and be ahead in the competitive professional environment.

IIT Bombay continues to make forays into newer territories pertinent to undergraduate and postgraduate education. The economics group already launched a four-year BS (Economics) degree program in 2017 that has been very successful and has attracted top IIT Joint Entrance Exam (JEE) rankers. In addition, the Department will offer in the future, a Minor specialization in economics and an Inter-Disciplinary Dual Degree Program (IDDDP) for the undergraduate students. An MS degree in economics will also introduced in near future.

For the first time starting this year, IIT Bombay introduced a new form of convocation called Commencement Ceremony*, which was held on May 2, 2023. During the Commencement Ceremony, the Degree of Doctor of Science (honoris cause) was conferred upon Prof. Rohini Godbole, Honorary Professor, Centre for High Energy Physics, IISc Bangalore, for her outstanding contributions

> **"** One of the major initiatives was the setting up of Design and Making Labs, which will allow students to gain access to top-of-the-class equipment for mechanical and electronic work including 3D printers, laser cutters and the latest workstation with Computer-Aided Design (CAD) software. **"**

to fundamental scientific research, specifically the theory of elementary particle physics.

The research and development activities at IIT Bombay kept up a brisk pace with time. During the year 2022-23, 280 R&D sponsored projects and 776 consultancy projects with a financial outlay of Rs. 330.66 crores and Rs. 111.39 crores respectively have been carried out in diverse areas of science, engineering, management and social sciences. IIT Bombay has filed 175 intellectual property (including 133 patents) applications and 211 IP rights (including 176 patents) were granted during the financial year 2022-23.

In the financial year 2022-23, Dean (Alumni and Corporate Relations) office raised ~Rs.180 crores, a 58% increase in fund collected compared to the previous year's collection of Rs.114 crores. Such fundings are being used to improve the research and academic infrastructure in the campus. One of the major initiatives was the setting up of Design and Making Labs, which will allow students to gain access to top-of-the-class equipment for mechanical and electronic work including 3D printers, laser cutters and the latest workstation with Computer-Aided Design (CAD) software. The labs form an essential part of the Institute's larger Makerspace initiative that envisions providing a comprehensive education to students through exposure to state-of-the-art thematic labs.

The progress of IIT Bombay on all fronts has been creditable in the past year and I would like to acknowledge the devoted efforts of the faculty, staff and administration of the Institute towards these goals. I will now present a brief report of the Institute activities this year.

ACADEMIC PROGRAMMES

IIT Bombay continues to make forays into newer territories pertinent to undergraduate and postgraduate education. The Department of Economics has already launched a four-year BS (Economics) degree programme in 2017 that has been very successful and has attracted top IIT Joint Entrance Exam (JEE) rankers. In addition, the Department will offer in the future, a Minor specialisation in economics and an Inter-Disciplinary Dual Degree Programme (IDDDP) for undergraduate students. An MS degree in economics will be introduced in the near future.

Launch of a new 'Master in Development Practice (MDP)' Programme

The Centre for Technology Alternatives for Rural Areas (CTARA), IIT Bombay, launched a new one-year postgraduate programme titled 'Master in Development Practice' in July 2022. This was in response to the demands from the stakeholders in the development sector for an academic programme for professionals interested in the development sector.
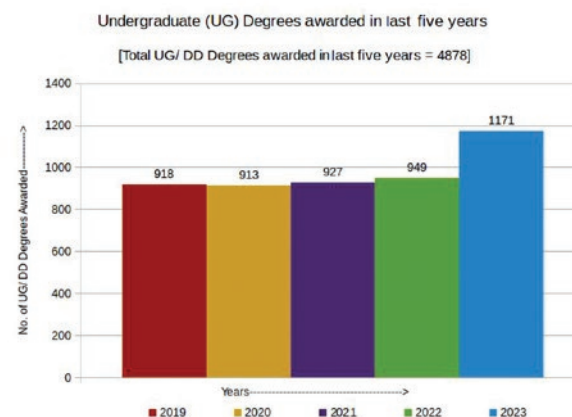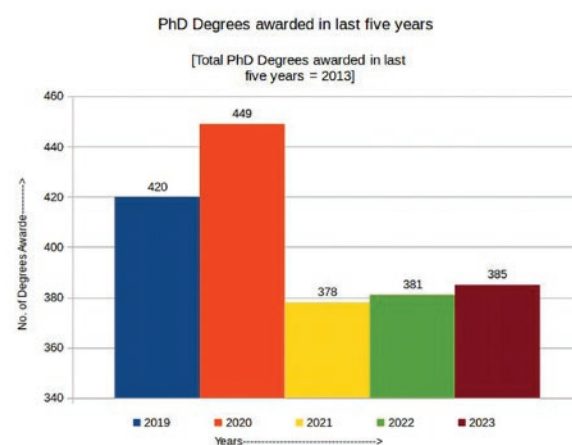
IIT Bombay makes AI and Data Science a must for undergraduate students

IIT Bombay has decided to introduce Artificial Intelligence and Data Science (AI-DS) as a mandatory course for undergraduate students — BTech as well as Bachelor of Science (BS) — from the academic year 2023-24. The introduction of AI-DS was among the recommendations made by the committee. The idea is to provide initial knowledge to students at an early stage of their undergraduate studies. Later, depending on their department or programme requirement, they can opt for another course at a higher level which will be department-specific.

While AI-DS will be introduced as a common course with mandatory credit in the first semester of the second year, interested students can take up more advanced courses in the field later.

IIT Bombay removes the option of branch change at the end of first year for 2023 and later entrants

The 256th meeting of the IIT Bombay Senate held on May 12, 2023 discussed several proposals related to reduction of academic stress for first year students. One of the key decisions was to remove the option of branch change at the end of first year for 2023 and later entrants. This

PhD Degrees awarded in last five years

[Total PhD Degrees awarded in last five years = 2013]

Masters Degrees awarded in last five years

[Total Masters Degrees awarded in last five years = 6946]

Undergraduate (UG) Degrees awarded in last five years

[Total UG/ DD Degrees awarded in last five years = 4878]

decision was made based on the observation that the pressure to get higher grades to earn a branch change was causing stress on many students, while only a few benefit from the change of branch. The number of seats at the time of admission may be correspondingly increased by a small number in some of the popular branches. Another key decision made by the Senate was to reduce the academic load on students by reducing one course per semester in the first year.

Thus those students who find it difficult to cope with the academic load, will have more time to work towards their courses.

GRADUATION STATISTICS *

Year	UG / DD			Masters			Ph.D.			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
2023	968	208	1171	1191	296	1487	296	124	420	2450	628	3078
2022	820	129	949	1192	245	1437	309	140	449	2321	514	2835
2021	820	107	927	1123	271	1394	249	129	378	2192	507	2699
2020	840	73	913	1088	240	1328	261	120	381	2189	433	2622
2019	822	96	918	1036	264	1300	266	119	385	2124	479	2603
* Number of degrees.												

IIT Bombay in National and International Rankings

National Institutional Ranking Framework (NIRF)

The National Institutional Ranking Framework (NIRF) was approved by the Ministry of Education (then MHRD) and launched by former Hon'ble Minister of Human Resource Development Ms. Smriti Irani in September 2015. This framework outlines a methodology to rank institutions across the country. The methodology draws from the overall recommendations and broad understanding arrived at by a Core Committee set up by MoE to identify the broad parameters for ranking various universities and institutions. The parameters broadly cover "Teaching, Learning and Resources", "Research and Professional Practices", "Graduation Outcomes", "Outreach and Inclusivity" and "Perception".

The results of NIRF 2023 were announced by the Hon'ble Minister of State for Education and External Affairs Dr. Raj Kumar Ranjan Singh on June 5, 2023.

IIT Bombay secured fourth position in Overall catagory, third in Engineering, tenth in Management, fourth in Research and seventh position in the NIRF-Innovation 2023 under the CFTI's category 'Institute of National Importance (Technical)'.

IIT Bombay's Rank in NIRF

Category \ Year	2019	2020	2021	2022	2023
Overall	4	4	3	3	4
Engineering	3	3	3	3	3
Management*	10	11	10	11	10
Research*			3	4	4
Innovation#			2	2	7

Research category in NIRF started in 2021.
Atal Ranking of Institutions on Innovation Achievements (ARIIA) is renamed as 'NIRF-Innovation' ranking

Atal Ranking of Institutions on Innovation Achievements (ARIIA) was initiated by the Ministry of Education, Government of India on August 30, 2018, to systematically rank all major higher educational institutions and universities in India on parameters related to "Innovation and Entrepreneurship Development" amongst students and faculties. The parameters used for consideration for ARIIA rankings include budget, facilities, awareness, entrepreneurship, commercialization, learning methods and governance.

The 4th edition of **Atal Rankings of Institutions on Innovation Achievements (ARIIA)** is renamed as **'NIRF-Innovation'** ranking 2023 and it has adopted the same framework, parameters and Key Performance Indicators (KPIs) of ARIIA.

Quacquarelli Symonds (QS) Rankings

The QS World University Rankings, inaugurated in 2004, has grown to become the world's most popular source of comparative data about university performance.

QS World University Rankings 2023

IIT Bombay has secured second position in India and 172nd rank this year in the Quacquarelli Symonds (QS) World University Rankings (2023). Overall, the Institute has improved on its 2022 performance by five places.

QS World University Rankings by Subject 2023

IIT Bombay has been ranked 1st in India and 47th globally in Engineering and Technology with an overall score of 80.4 out of 100 in the Quacquarelli Symonds (QS) World University Rankings by Subject for 2023. The Institute has been ranked in 4 out of 5 broad subject areas, which includes Engineering and Technology, Natural Sciences, Social Sciences and Management and Arts and Humanities. Overall, the Institution improved on its 2022 performance by 18 places.

QS Asia University Rankings 2023

Indian Institute of Technology Bombay (IIT Bombay) secured the first position in India and 40th rank this year in the QS Asia University Rankings 2023.

IIT Bombay Tops The QS Sustainability Ranking 2023 in India

IIT Bombay secured first place in India and is ranked in the range 281-300 globally in the QS Sustainability Ranking 2023. The Institute is ranked 173rd in the 'Environmental Impact Performance' and 484th rank in the 'Social Impact Performance' category of the QS Sustainability Ranking 2023. The result was released on October 26, 2022.

IIT Bombay's Rank in QS Rankings:

Sr. No.	2019		2020		2021		2022		2023	
	Int.	Nat.	Int.	Nat.	Int.	Nat.	Int.	Nat.	Int.	Nat.
	QS World University									
1	162	1	152	1	172	1	177	1	172	2
	QS World University by Subject									
2			44	1	49	1	49	1	47	1
	QS University Rankings-Asia									
3	33	1	34	1	37	1	42	1	40	1

Int. = International, Nat. = National

RESEARCH AND DEVELOPMENT ACTIVITIES

IIT Bombay continues to grow its research and development (R&D) potential through extramural fundings received from government and non-government agencies. IIT Bombay received funds to the tune of Rs. 375 crores in the financial year (FY) 2022-23 from external agencies, with non-government agencies including industries (both Indian and foreign) contributing almost 40% of these receipts. 280 R&D projects were initiated with a sanctioned outlay of Rs. 330 crores. Consultancy projects worth Rs. 111 crores were also initiated during this period.

R&D Activities

The Office of Dean (R&D) continued to engage and facilitate research and development initiatives at IIT Bombay by administering R&D projects, facilitating industry interactions, managing intellectual property and licensing activities, reviewing and finalizing R&D related agreements and contracts, supporting high-end research infrastructure and disseminating R&D related information in various fora, amongst other roles. Many new R&D projects and related activities were undertaken during the year 2022-23.

R&D projects, both as short-duration consultancy projects and long-duration sponsored research projects, were initiated (Table 1).

Table 1: Information on new projects sanctioned during last three years

Financial Year	Sponsored Projects		Consultancy Projects	
	Number	**Sanctioned outlay (Rs. in crores)***	**Number**	**Projects outlay (Rs. in crores)***
2022-23	280	330.66	776	111.39
2021-22	242	220.29	648	79.95
2020-21	246	297.68	538	68.79
*: includes GST for Indian party/ clients				

External Grants for R&D

IIT Bombay received funds to the tune of **Rs. 375 crores** in FY 2022-23 from external agencies. This includes funds for new as well as ongoing projects as indicated in Table 2.

Table 2: Funds received for R&D in 2022-23

Project Type	Funds received (Rs. in crores)
Sponsored Projects	263.08
Consultancy Projects	99.63
Royalty	1.43
Equipment usage	11.06
Total	**375.20**

This year, funds received were majorly from government agencies with a sizeable contribution from industries (both Indian and foreign) as well as trusts, societies etc. The percentage contribution of different types of funding agencies is shown in Figure 1.
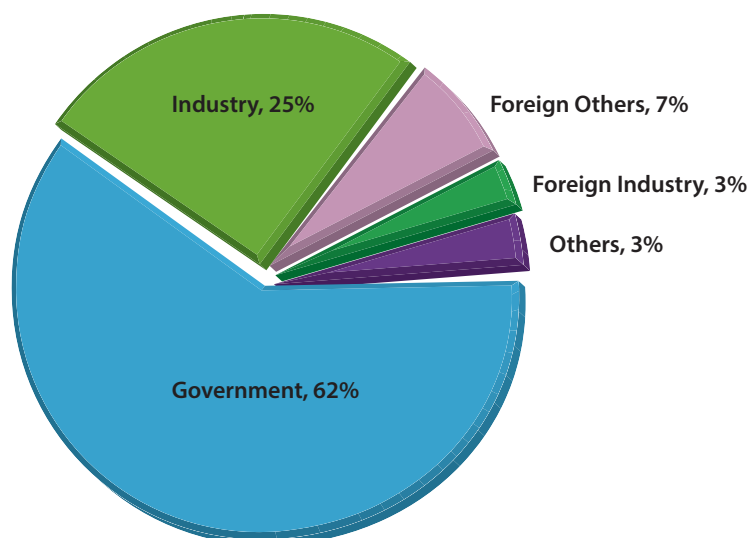
Figure 1: Types of funding agencies and percentage contribution for R&D receipts (Sponsored Projects + Consultancy Projects)

In FY 2022-23, IIT Bombay initiated **280** R&D projects with sanctioned outlay of **Rs.330 crores**. These span various domains of research in science and engineering – both applied and basic as well as humanities, social sciences and management studies. Some highlights are given below:

- **IIT Bombay Center for Semiconductor Technologies (SEMIX):** This year, IIT Bombay has set up the Center for Semiconductor Technologies (SEMIX). SEMIX aims to enable semiconductor industry driven R&D, workforce development and entrepreneurship by serving as a common platform to integrate efforts of multiple academicians, investors and most importantly, government policy makers.

- **E-Yantra-Robot enhanced teaching in science and engineering colleges:** After successful completion of the earlier phases, IIT Bombay received sanction for next phase of E-Yantra-Robot enhanced teaching in science and engineering colleges (phase 3) with an outlay of Rs. 39 crore.

- **Gold award:** IIT Bombay has been awarded the Gold award under the Category "Outstanding research on Citizen Centric Services" by academic/ research institution of the national awards for e-governance scheme 2021-22 for IIT Bombay's work on video analytics for safety and compliance applications.

- **Project "Udaan":** IIT Bombay's end-to-end machine translation and post editing ecosystem is being widely used for the translation of the second and third year engineering textbooks into 12 Indian languages. IIT Bombay has signed an agreement with the Department of Higher and Technical Education, Government of Maharashtra on January 5, 2023 to collaborate to translate all conventional as well as professional course books in the Marathi language as outlined in the National Education Policy 2020.

Some major sponsored projects initiated in FY 2022-23:

- **National Centre for Photovoltaic Research and Education (NCPRE) Phase 3**
Funding Agency: Ministry of New and Renewable Energy
Sanctioned Outlay: Rs. 40.9 crores over 4 years

- **Development of smart drone ecosystem and demonstration of social applications towards larger drone deployment strategy of Maharashtra**
  Funding Agency: Rajiv Gandhi Science and Technology Commission
  Sanctioned Outlay: Rs. 33.7 crores over 5 years

- **Centre for Liberal Education:** IIT Bombay received a grant of Rs. 32 crores from The Ford Foundation for core support to strengthen the research vertical of the Centre for Liberal Education and to pursue a project on new political economy initiative.

- **New Political Economy Initiative**
  Funding Agency: The Ford Foundation
  Sanctioned Outlay: Rs. 32.0 crores over 5 years

- **National Disease Modelling Consortium**
  Funding Agency: Bill and Melinda Gates Foundation
  Sanctioned Outlay: Rs. 16.3 crores over 1.5 years

- **Assimilation of Open-Source Software in Science and Engineering**
  Funding Agency: Ministry of Education
  Sanctioned Outlay: Rs. 15.0 crores over 5 years

- **Medical Engineering Design and Innovation Centre (MEDIC)**
  Funding Agency: Department of Biotechnology
  Sanctioned Outlay: Rs. 9.33 crores over 5 years

- **NPTEL Translation Project (Sub-project of CSS-MOOCs NPTEL)**
  Funding Agency: Ministry of Education
  Sanctioned Outlay: Rs. 6.1 crores over 3 years

- **PAVITRA (air Pollution mAnagement and interVentIon Tool foR IndiA)**
  Funding Agency: Good Ventures Foundation
  Sanctioned Outlay: Rs. 5.3 crores over 3 years

- **Centre of Excellence (CoE) on Membrane Technologies for Desalination Brine Management and Water Recycling**
  Funding Agency: Department of Science and Technology
  Sanctioned Outlay: Rs. 5.3 crores over 5 years

Along with sponsored R&D efforts, consultancy activities were taken up this year for different government, public sector and industries, both Indian and international. The types of consultancy provided included expert advice, retainership, product/ process/ software development, analysis, evaluation, image reconstruction and stress testing.

Some representative consultancy project areas are listed:
- Continuous flow process
- Health and Nutrition
- Technical and Research Advisory
- CBCT image reconstruction
- Stress assessment
- Battery technology
- Fabrication of printed antenna
- Nuclear Magnetic Resonance (NMR) Studies
- Charging systems for Electric Vehicles
- Structural audits

Internal Funding for R&D
The Institute released funds to the tune of Rs. 33 crores in total for R&D related activities. The Institute provided internal funding for supporting faculty research. Funds up to Rs. 9 crores were sanctioned as seed grant and augmented seed grant for initiation of research for new faculty members.

The funds released by the Institute during the FY 2022-23 were distributed across the following areas:
- Seed grant for initiation of research for new faculty
- Augmented seed grants for procuring high-end research equipment
- Maintenance of central and national research facilities
- Awards and recognition to faculty recipients of Research publication award, Impactful research award, Research dissemination award and Early research achiever award
- Facilitating grants to faculty members for filing patents, research publications and/or international travel
- Leverage grants and bridge grants
- Fellowships for PhD student
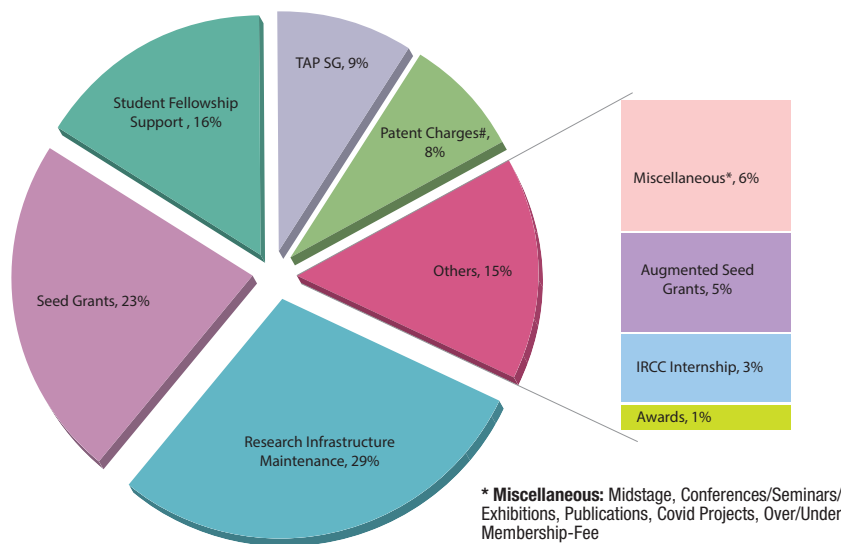
Figure 2: Percentage distribution of Institute funding related to R&D activities

- Conferences, seminars, exhibitions
- Publications
- Student research/ competition/ event: projects such as IIT Bombay Rocket Team, Mars Rover, Team Shunya, AeRoVe, Rakshak, STRIDE, Intelligent Ground Vehicle Competition, IIT Bombay Racing, Student Satellite project, AUV IIT Bombay

⚑ *AUV IIT Bombay participating in Robosub 2022*

⚑ *Matsya at R&D Fair IInvenTiv*

Aerial Robotics Vehicles (AeRoVe) Drone prototypes

IIT Bombay – Industry Interactions for R&D

The Institute continued its efforts to enhance interaction with its industry collaborators.

Around 378 Indian and international industries approached IIT Bombay for partnership through collaborative R&D projects and consultancy services. The interactions were managed seamlessly by facilitating exploratory meetings and technical discussions with faculty members in the areas of mutual interest. Around 205+ meetings, in both physical and virtual modes, were coordinated by Industrial Research Consultancy Center (IRCC) during the year 2022-23. Agreements were entered into to establish a formal association.

Some of the industries and PSUs that visited and/or approached the Institute to explore research collaborations include:

- Accenture
- Amazon
- Ambetronics Engineers
- Army Design Bureau
- Bajaj Auto
- Bank of India
- Bharat Forge
- Daiichi-Sankhyo
- Directorate of Technical Education Maharashtra
- Emerson Electric
- Hanumat Agencies
- Hindustan Petroleum Corporation Ltd.
- Imperial Pharmachines
- Indian Register of Shipping
- Institute of Petroleum Safety
- Health and Environment Management (IPSHEM)
- Kirloskar Pneumatic Company Limited (KPCL)
- KPIT Technologies
- Larsen and Toubro Infotech
- Maharashtra Energy Development Agency (MEDA)
- Medirays
- Minda Corporation
- National Centre for Communication Security (NCCS)
- Nibe Limited
- Puri Crawford
- Reliance
- Schaeffler
- Schindler India
- SGX Minerals
- Security Printing and Minting Corporation of India Ltd
- TATA Power
- TATA Sons Innovation Group
- Vedanta
- V-Guard
- Voltas
- Volvo
- Wobot.ai

Discussions with many of these industries are currently ongoing and some have resulted in projects.

⬆ *Meeting with Emerson Electric*

⬆ *Meeting with Directorate of Technical Education, Maharashtra* ⬇

R&D Related Agreements

More than 300 agreements were finalized and signed during the year including those for research collaboration, setting up consortia/ centres of excellence, licensing, non- disclosure agreements, IP transfer, student sponsorships, endowment, material transfers, etc. with industries, organizations, universities and government, both national and international.

⬆ *MoU with L&T*

⬆ *MoU with India Meteorological Department*

Augmentation of Research Infrastructure:

As part of creating and upgrading infrastructure for enabling R&D, a bridging fund of approximately Rs. 5 crores was approved for setting up various research facilities.

Intellectual Property (IP) Protection Activities

During FY 2022-23, 176 intellectual property (patent, trademark, design and copyright) applications were filed. Count of all Indian and international IPR filings and grants are given in Table 3.

Table 3: Patents, other IP Applications filed and granted during FY 2022-23

Type of IP	Applications filed (No.)	Granted (No.)
Indian Patents	125	162
Patent Coopera-tion Treaty (PCT)	4	NA
Foreign Patents	5	14
Trademark	29	23
Industrial Design	11	12
Copyright	2	0
Total IPs	**176**	**211**

Licensing Activities

Support to Entrepreneurship: In FY 2022-23, IIT Bombay provided in principle approvals/ NoCs to 10 IIT Bombay researchers for starting a company/ new venture and for using technologies/ intellectual property created and developed in the Institute.

The start-ups created include:

- EffecMed Pvt. Ltd.
- Zest Clean Power Pvt. Ltd.
- Profprenuer Innovations Pvt. Ltd.
- Supash Infraphotronic Semicon Innovations Pvt. Ltd.
- Kripsika Innovations Pvt. Ltd.
- Arotic Labs Pvt. Ltd.
- Urjanovac Pvt. Ltd.
- TASK Systems and Instruments Pvt. Ltd.

Technologies licensed to the industries: IIT Bombay licensed technologies to various industries and companies. Some of them are:

- Rapid and bulk synthesis of tin mono sulphide and its application to lithium-ion batteries anode
- Sodium-ion based full cell and method of fabricating electrodes for the sodium-ion based full cell
- A zonal storage water supply system with Hydraulic Isolation Structures and a method thereof
- 5GCore, N3IWF with Multi-RAT SDN controller and RANEmulator
- N3IWF and SDN Controller Components for WLAN interworking with 5G Mobile Network
- Portable Patient Chair
- Floating Solar Photo-Voltaic (FSPV) system
- System and method for vehicle based distribution of water
- webSTLF
- Blood Smear Device
- Arsenic Filter
- A portable microscope
- Digital inverted bright field microscopes with single and variable magnifications
- Renewable energy system with improved reliability suitable for extreme condition
- Bone regeneration and repair devices
- Non-invasive ventilation (NIV) masks
- Combustion system
- Thermal camera for target detection, temperature measurement and monitoring
- Integrated Wetland Technology (IWT)
- Maintenance Free Letterbox
- A semiautomated tool for fabrication of vacuum based optoelectronic devices: Cluster Tool
- Combining direct air capture and soda ash plant processing for sustainable CO2 mitigation

- *Vaksancayah* - Sanskrit Speech Corpus
- QMS App for Data Collection from Medical Devices
- Design and Vendor Verification Document for medical device
- Anti-hail Gun System
- High-speed optical and wireline interconnects
- Smart wearable sensor
- Integrated processing approach for geophysical and geoinformatic data processing
- Ultrasonic Water Meter

The IIT Bombay researchers have founded a startup based on technology related to 'Anti- Hail Gun System'. An anti-hail gun system is used to suppress the formation of hailstorms through the application of detonation waves that propagate from the gun to the clouds. It creates acoustic vibration with the help of a strong shock wave, which mix up the charges inside the cloud and create a neutralized zone to stop the further formation of hails.

IIT Bombay has developed a technology related to non-invasive ventilation (NIV) masks for critical care and an aesthesiology. The innovation provides an additional tube insert arrangement for a respiratory mask having for oral/nasal insertion of a tube. It is critical to ensure that the patient's breathing is not disrupted while inserting a feeding tube without any leakages due to the insertion of the tube in the NIV mask. IIT Bombay has licensed the said innovative technology to industry for commercialization.

llT Bombay in collaboration with industry has developed a technology/ innovation related to digital inverted bright field microscopes with single and variable magnifications and with digital displays in the form of a mobile phone or a tablet. These microscopes are capable of capturing, storing and transmitting high-resolution colour images and videos and can be used in pathology labs, biology teaching labs in schools, colleges, universities, as well as in research institutes. The microscopes have been commercialized and are available in the market through our industry partner.
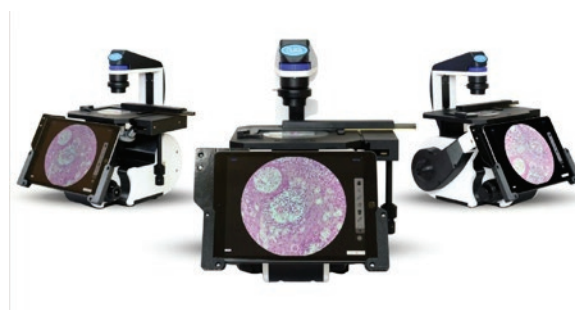
⬥ *Inverted brightfield digital microscope*

IIT Bombay has developed a technology related to a semiautomated tool for the fabrication of vacuum based optoelectronic devices: Cluster Tool. This technology deals with the development of a customized tool to fabricate a multilayer thin film optoelectronic device. The said technology has been licensed to the industry.

⬥ *Cluster Tool*

Awards and Recognitions
External R&D and IP Awards

⬥ *Prof. Sudesh Balan's film 'Saakshatkaaram' won the Silver Conch for the Best Short Fiction Film at the Mumbai International Film Festival-MIFF 2022*

⬥ *IIT Bombay wins the Questel IP Excellence Award 2022*

⬥ *Prof. Rajneesh Bhardwaj, Department of Biosciences and Bioengineering has received the SERB-STAR Science and Technology Award for Research*

⬥ *Prof. P. Nanthagopalan (L) and Mr. Nabodyuti Das (R) of IIT Bombay receiving NSG Counter -IED Innovator Awards 2022 for the joint innovation of Blast, Ballistic and Electromagnetic Pulse Resistant Concrete* ⬇

R&D Awards by IIT Bombay:

This year, various R&D research awards such as Research Publication Awards, Research Dissemination Awards, Early Research Achiever Awards and Impactful Research Awards were conferred on the faculty recipients based on a call-for-nominations and selection by a committee appointed by the Director.

Following are the award recipients:

IIT Bombay Research Publication Awards 2021

1. Prof. Sudarshan Kumar, Department of Aerospace Engineering

2. Prof. Rajdip Bandyopadhyaya, Department of Chemical Engineering

3. Prof. Chandra M. R. Volla, Department of Chemistry

4. Prof. Anil Kottantharayil, Department of Electrical Engineering

5. Prof. Atul Srivastava, Department of Mechanical Engineering

IIT Bombay Research Dissemination Awards 2021

1. Prof. Debabrata Maiti, Department of Chemistry
2. Prof. Santanu Banerjee, Department of Earth Sciences

IIT Bombay Early Research Achiever Award 2021

1. Prof. Rahul Maitra, Department of Chemistry
2. Prof. Swatantra P. Singh, Environmental Science and Engineering Department
3. Prof. Dipanshu Bansal, Department of Mechanical Engineering
4. Prof. Rohan Chinchwadkar, Shailesh J. Mehta School of Management

IIT Bombay Impactful Research Awards 2021

1. Prof. Debabrata Maiti, Department of Chemistry
2. Prof. Rajneesh Bhardwaj and Prof. Amit Agrawal, Department of Mechanical Engineering

These awards were conferred to the recipients on the occasion of National Education Day (Rashtriya Shiksha Diwas) on November 11, 2022 at VMCC Nag Auditorium by Mr. Amit Sharma, Managing Director and CEO, Tata Consulting Engineers Limited.

Award Lectures at IIT Bombay

The recipients of various prestigious awards gave talks (details given below) on their research work to the IIT Bombay academic community:

1. Rakesh Mathur Award Lectures were conducted on March 8, 2023 in F. C. Kohli Auditorium.

2. Institute Award Lecture series comprising IRCC Awards was conducted during November 1-2, 2022 at VMCC.

3. Dr. P. K. Patwardhan Technology Development Award Lecture was held on August 25, 2022 at VMCC.

⬧ *Recipients of Rakesh Mathur Awards 2022*

R&D Dissemination and Outreach

R&D Fair:

23 IITs came together for a mega R&D fair 'IInvenTiv' held during October 14-15, 2022 at the IIT Delhi premises.

The event, organised in commemoration of the 75th year of India's Independence inline with the Azadi ka Amrit Mahotsav initiative, showcased indigenous research, development and innovations of IITs on a global platform.

The event also provided a platform for collaborative avenues among state universities and institutes, industry and the IITs for better development and reach of the innovations at the grassroots level. IIT Bombay was the organising institute for the R&D Fair.

Glimpses from IInvenTiv-R&D Fair 2022

IInvenTiv featured more than 75 technologies and six showcase projects inline with Make-in-India and Digital India initiatives. The broad themes included Defence and Aerospace; Healthcare; Environment and Sustainability; Clean Energy and Renewables; Manufacturing; AI/ ML/ Blockchain Technologies; Smart Cities and Infrastructure; Communication Technologies; Robotics, Sensors and Actuators; Semiconductors, Flexible Electronics and Nanotechnology.

Workshop on Quantum Science and Technology

As part of the annual IRCC CONferences on emerging conceptS [ICONS], a two-day workshop on Quantum Science and Technology was organized by the Office of the Dean (Research and Development), along with the Centre of Excellence in Quantum Information, Computing, Science and Technology [QuICST] during February 17-18, 2023.

The main workshop included talks by luminaries of the quantum information and computing world, including Prof. John Martinis (University of California and Google Quantum AI Lab); Prof. Sougato Bose (University College London); and ex-Principal Scientific Advisor to the Government of India, Prof. K. VijayRaghavan (National Centre for Biological Sciences, Bengaluru).

The workshop also featured a distinguished institute lecture by Prof. Serge Haroche, the winner of the 2012 Nobel Prize in Physics for his 'ground-breaking experimental methods that enable measuring and manipulation of individual quantum systems'.

This event was organised in cooperation with CEPIFRA and the French Embassy in India.

The event also featured colloquiums and talks by faculty members affiliated to QuICST from different departments at IIT Bombay, covering different aspects of quantum science and technology such as quantum computing and simulation, quantum communication, quantum sensing, cryptography and quantum materials. A panel discussion on 'Quantum Technology: Now and Future' by eminent scientists, government officials and industry representatives deliberated on the emerging quantum ecosystem in India.

The workshop provided a platform for cross-fertilization of ideas, collaboration across departments and outreach to the industry. The event was attended by nearly 250 participants, including students and faculty members from both IIT Bombay and other institutes and colleges in the region.

Prof. Serge Haroche, the winner of the 2012 Nobel Prize in Physics with IIT Bombay Director Prof. Subhasis Chaudhuri

TechConnect 2022

TechConnect, IIT Bombay's largest research outreach activity, was conducted as a part of Techfest held during December 16-18, 2022. It was inaugurated by Dr. V. Narayanan, Director, Liquid Propulsion Systems Centre (LPSC), Indian Space Research Organisation (ISRO).

The event showcased the Institute's R&D achievements in reaching out to critical societal needs, industry requirements and contributions to basic research.

TechConnect 2022 had ninety exhibition booths covering research and development, educational outreach, student tech teams, startups from SINE and technologies ready for transfer. Stalls from the Dean (R&D) office exhibited posters on technology development. R&D brochures were distributed to visitors.

Nobel Award Lectures

⮝ *Lectures by domain experts (faculty members from Institute) on the work of winners of the Nobel Prizes 2022 were organised on November 10, 2022 in VMCC. The speakers were Prof. Suvarn Kulkarni, Prof. Aditi Chaubal, Prof. Sudha Shastri, Prof. Sai Vinjanampathy and Prof. Kiran Kondabagil.*

Student Event

ENTHUSE- The freshmen research orientation was conducted in an offline setting for the first time after the pandemic break. Over 1300 first year UGs of IIT Bombay attended the event which was organized simultaneously in three venues on campus (viz. VMCC, F.C. Kohli and LTPCSA). There were presentations by Institute faculty members with the aim of motivating students to explore research in different departments. The speaker's sessions interspersed with interactive activities planned by EnPoWER like Guesstimates, UG research experience talk and a live demonstration made the event an immersive, interactive and yet informative for freshers.

Media Outreach for R&D

Research News Articles:

IRCC realizes the need to communicate its R&D efforts with wider society. Towards this, IRCC had brought out 16 easily accessible stories this year conveying IIT Bombay's achievements. These articles have been released in English, Hindi and Marathi languages. Many of these articles have been picked up by mainstream and online media and disseminated further.

Release of R&D Brochure

A technology booklet titled 'IBIS: Indian Institute of Technology Bombay's Ideas and Innovations for Society' was released by Dr. Mashelkar and Mr. Niraj Bajaj during the inauguration ceremony of the Rahul Bajaj Technology Innovation Centre (RBTIC) on June 10, 2022.

IBIS is a compendium of about 100 technologies developed by the Institute's faculty members and researchers in recent years. The innovations are at various levels of technology readiness and span from defense to healthcare, robotics to environment and sustainability, communication to clean energy etc.

A brochure titled **'R&D Highlights'** reporting some of the outcomes of R&D efforts undertaken at the Institute, interactions with the industry and the possible modes of collaboration, was updated and distributed in forums like TechConnect 2022 and to Industry partners to disseminate information on the Institute's R&D activities and industry interactions.

Focussed Initiatives on Ethics and Safety

Institute Ethics Committee (IEC):

During the year 2022-23, the Institute Ethics Committee received 24 new proposals and 19 proposals were approved in expedited, full board or exempt mode depending on nature of proposals. IIT Bombay Institute Ethics Committee was reconstituted in September 2022 with Dr. Renuka Munshi, Department of Clinical Pharmacology, TN Medical College & BYL Nair Hospital as the Chairperson.

Institutional Review Board (IRB):

The Institutional Review Board (IRB), received 56 proposals in the FY 2022-23 from various academic units and 46 proposals were approved. A workshop was held on January 25, 2023 to sensitize the researchers about the scope of IRB, approval process, etc.

Safety: A safety orientation programme was conducted for new postgraduate students who joined in July 2022 and January 2023. The orientation was conducted for twenty-two academic units. Three Institutional Biosafety Committee (IBSC) meetings were held during this period. The IBSC reviewed forty-seven proposals. Twenty-three proposals were approved by the committee.

Online Processes:

Following activities were undertaken to upgrade the online system:

1. Upgradation of Central Facility activities like monthly consolidated reporting, registration and approval of new users, process flow for usage charges for internal users, user forms for external users etc.
2. New Module for Consultancy in lieu of holding equity in startups is made and released to faculty members
3. Login created for new internship candidates
4. Updating MoU interface
5. Proposal submission for 'Seed funding for Collaboration and Partnership Projects testing' (SCPP) to faculty
6. To generate a bulk uploading report for PFMS, Drona DTS system has been changed and added extra information
7. SSO Authentication is implemented in Drona.
8. Online approval process for faculty members on extended leaves

Project manpower

Number of Project staff/fellow working in various projects as on March 31, 2023 is 1100. Among them,701 joined during the FY 2022-23.

EDUCATIONAL OUTREACH

The Educational Outreach Office is an umbrella body comprising of erswhile Continuing Education and Quality Improvement Programme (CE&QIP) along with Pramod Chaudhari Alumni Continuing Education Centre (PCACEC), Centre for Distance Engineering Education Program (CDEEP) and National Programme on Technology Enhanced Learning (NPTEL)/ SWAYAM - a programme initiated by Government of India and designed to achieve the three cardinal principles of Education Policy viz., access, equity and quality.

Many of the Institute's outreach courses for the industry are well established worldwide and continue to attract large participation, both from within India as well as from abroad.

A total of 68 continuing education courses (including three GIAN courses) were conducted with about 1029 participants from industries, organizations and institutions, with a revenue of about Rs. 5 crore.

Three online/ offline course and master services agreements were signed with EdTech Service Providers Simplilearn, Coursera and Great Learning for offering outreach coureses for the next three years. These partners will offer open courses very soon.

Under the QIP category, five PhD students from AICTE - approved engineering colleges were admitted in 2022. In addition, 11 college teachers were inducted into PhD programme under the advance admission scheme. They would join the Institute for the regular programme from July 2023.

The Pramod Chaudhari Alumni Continuing Education Centre (PCACEC) offers courses exclusively to IIT Bombay alumni. Six courses on "state-of-the-practice", such as Introduction to Python with Applications and Statistics for Decision Making, were offered in 2022-23 by faculty members from eight departments.

The Centre for Distance Engineering Education Programme (CDEEP) continued its functioning as a support unit to various outreach activities of the Institute. During the year 2022-23, CDEEP recorded 30 courses, covering 14 disciplines at IIT Bombay. The last academic year saw 5819 enrollment to 353 active CDEEP courses. During the year, CDEEP also added three new semester-long courses to its archive of 401 courses for the National Programme on Technology Enhanced Learning (NPTEL). Additionally, CDEEP recorded and live-streamed important Institute events such as Convocation, Interim session of 61st Convocation, Foundation Day, viewed by more than 88517 viewers. The Centre also covered many events like Institute Colloquia, talks by distinguished speakers, Orientation programme for the freshers, Matribhasha Divas, Alumni Day, National Unity Day, National Science Day, etc. with a viewership of around 1,05,000.

The NPTEL/ SWAYAM programme at IIT Bombay offered a total of 100 courses in the last two semesters (July 2022 and January 2023). These courses saw total enrollments and registrations of 1,76,606 and 28,727 learners throug the SWAYAM platform.

ADMINISTRATIVE AFFAIRS

The Office of Dean (Administrative Affairs) deals with Manpower Management (non-faculty and non-project staff (permanent, temporary and out-sourced)) and Administration Process/ Services for the Institute. Accordingly, the office is responsible for the formulation for policies regarding administrative structures/ links, assessment of staffing/ manpower needs at different levels, defining duties/ responsibilities and authority levels, job functions/ profiles, recruitment policies, career/ promotion stages and allocation and sanctioning of optimal manpower resources to different units and related staff hiring/ recruitment.

For effective implementation of revised/ new policies, the office is supported by the concerned units of the Registrar and Applications Software Cell (ASC).

Following is the summarised report on promotion for the year 2022-23:

Sr. No.	Date of effect of Promotion	Count in Group A	Count in Group B and C	Total
Intra Cadre Promotion				
1	1.1.2022	6	38	44
2	3.6.2022	-	58	58
3	4.6.2022	-	1	1
4	1.12.2022	-	1	1
5	1.7.2022	-	1	1
6	1.8.2022	-	1	1
7	1.9.2022	-	1	1
8	1.1.2023	-	1	1
9	1.1.2023 Almost ready to be released within a time period of 15 working days	6	74	80
10	1.2.2023	-	1	1
	Total (A)	**12**	**177**	**189**

Sr. No.	Particulars	Group A	Group B and C	Total
Inter Cadre Promotion likely to get accomplished latest by June -July 2023				
1	Group A to A	4	-	4
2	Group B TO A	19	-	19
3	Group C to B	-	37	37
4	Group D to C	-	25	25
	Total (B)	23	62	85
	Grand Total (A +B)	**35**	**242**	**277**

Procurement conclave of all IITs held at IIT Bombay

▲ *Prof. S. Sudarshan, Dy. Director (AIA), IIT Bombay; Prof. K.V. K. Rao, Dy. Director (FEA), IIT Bombay; Commodore B. K. Manjal (Retd.), Defence Advisor, GeM; Col. Naveen Wadhera (Retd.), Advisor, Defence Integration, GeM; Prof. S. V. Kulkarni, Dean (AA), IIT Bombay; Shri. Ganesh Bhorkade, Registrar, IIT Bombay; and Officials from IIT Bombay, IIT Bhilai, IIT Delhi, IIT Dharwad, IIT Gandhinagar, IIT Goa, IIT Guwahati, IIT Indore, IIT Kanpur, IIT Kharagpur, IIT Mandi, IIT Madras, IIT Patna, IIT Roorkee and IIT Tirupati.*

The Indian Institute of Technology Bombay organised a two-day Procurement Conclave for procurement officers of all IITs at IIT Bombay campus on November 18-19, 2022. This was the first-of-its-kind conclave organised by any IIT.

Representatives from about 15 IITs took part in the conclave along with officials from the Ministry of Finance and Government e-Marketplace (GeM) as guest speakers. Prof. S. Sudarshan, Deputy Director (Academic and Infrastructural Affairs), IIT Bombay welcomed the participants and guest speakers in his inaugural address. Mr. Ganesh Bhorkade, Registrar, IIT Bombay emphasized the need for conducting Procurement Conclave in his opening remarks and strongly recommended to organise such conclaves at periodic intervals.

The Advisor from the Procurement Policy Division of the Ministry of Finance Mr. Sanjay Aggarwal held a session on General Financial Rules (GFR) regulations and its recent amendments in policies pertinent to public procurement of the Government of India.

Commodore B. K. Munjal (Retd.), Advisor, Defence, Government-e-Marketplace, held a session on 'Emerging Trends in Sourcing through GeM'. Prof. Milind Atrey, Dean (Research and Development), IIT Bombay highlighted the changing approach of IIT's from 'Teaching and Research' to 'Teaching, Research and Entrepreneurship' and urged that the procurement policies need to be aligned with this change.

During the panel discussion, moderated by Prof. K. V. K. Rao, Deputy Director (Finance and External Affairs), IIT Bombay, the panelists – Mr. Sanjay Aggarwal, Advisor, PPD, MoF, Col. Naveen Wadhera (Retd.), Advisor, Defence Integration, GeM and Prof. S. V. Kulkarni, Dean (Administrative Affairs), IIT Bombay and participants expressed that IITs should brainstorm and arrive at a consensus regarding policy amendments needed to accommodate procurement requirements of CFTI's with regard to goods and services needed for research and development activities.

FACULTY ACHIEVEMENTS AND RECOGNITIONS

During the year, 34 faculty members (17 Assistant Professor Grade I, one Associate Professor (contract) and 16 Assistant Professor Grade II joined the Institute. The number of full-time faculty members on the roll of the Institute has risen to 718 comprising 372 Professors, 01 Professor (contract), 182 Associate Professors, one Associate Professor (contract), 139 Assistant Professors (Grade-I) and 23 Assistant Professors (Grade-II). In addition, there are 70 adjunct faculty members and 278 post doctoral fellows on the roll. Around 13 faculty members retired – eight of whom were re-employed and four resigned during the year.

The Institute provided financial assistance to 217 faculty members for participating in international conferences.

Apart from educational and research pursuits, the faculty of the Institute meet national and global obligations in diverse ways. Many of them have accepted membership of various national committees and editorship of journals. They also review manuscripts for publications. The efforts of faculty members have received recognition in the form of many awards and distinctions, some of which are listed below:

Prof. Amit Agrawal, Department of Mechanical Engineering, has been elected as a Fellow of Indian National Science Academy, New Delhi.

Prof. Sudhir Ghorpade, Department of Mathematics, has been elected as a Fellow of Indian National Science Academy, New Delhi.

Prof. Samir Maji, Department of Bioscience and Bioengineering, has been elected as a Fellow of Indian National Science Academy, New Delhi.

Prof. Debabrata Maiti, Department of Chemistry, has been elected as a Fellow of Indian Academy of Sciences (FASc) - 2023, Bangalore.

Prof. Ranjith Padinhateeri, Department of Biosciences and Bioengineering, has been elected as a Fellow of Indian Academy of Sciences (FASc) - 2023, Bangalore.

Prof. Soumyo Mukherji, Department of Biosciences and Bioengineering, has been elected as Fellow of the National Academy of Sciences, India (FNASc).

Prof. Subhananda Chakrabarti, Department of Electrical Engineering, has been elected as Fellow of Indian National Academy of Engineering (INAE).

Prof. Sudarshan Kumar, Department of Aerospace Engineering, has been elected as Fellow of Indian National Academy of Engineering (INAE).

Prof. Pramod Wangikar, Department of Chemical Engineering, has been elected as Fellow of Indian National Academy of Engineering (INAE).

Prof. Aparna Singh, Department of Metallurgical Engineering and Materials Science has been selected to receive the INAE Young Engineer Award-2022.

Prof. Dipanshu Bansal, Department of Mechanical Engineering, has been awarded the INSA Medal for Young Scientists, 2022 for his scientific his contributions to scalable computational and data-driven approches towards shape understanding, synthesis and re-conslutation of high quality three-dimension digital objects.

Prof. Siddhartha Chaudhuri, formerly associated with Department of Computer Science and Engineering, has been awarded the INSA Medal for Young Scientists, 2022.

Prof. Sandip Mondal, Department of Electrical Engineering, has been awarded the INSA Medal for Young Scientists, 2022.

Prof. Sadhana Dash, Department of Physics, has been awarded the "SERB POWER Fellowship 2022" in the stream Physical Sciences/ Physics.

Prof. Dipendra Prasad, Department of Mathematics, has been elected as the Fellow of 'The World Academy of Sciences (TWAS)'.

Prof. Devang V. Khakhar, Department of Chemical Engineering, has been selected as INAE Chair Professor for a period of three years.

Prof. R. K. Shyamsunder, Department of Computer Science and Engineering, has been selected as INAE Distinguished Professor.

Other Fellowships:

Prof. Gopal Dixit, Department of Physics, has been elected as Fellow of "JSPS Invitational Fellowships for Research in Japan".

Prof. Prasanna Gandhi, Department of Mechanical Engineering, has been selected for the Abdul Kalam Technology Innovation National Fellowship.

Prof. Udayan Ganguly, Department of Electrical Engineering, has been selected for the Abdul Kalam Technology Innovation National Fellowship.

Prof. Sharmistha Saha, Department of Humanities and Social Sciences, has received a Fulbright-Nehru Fellowship for Academic and Professional Excellence.

Prof. Rohit Srivastava, Department of Biosciences and Bioengineering, has been elected as Fellow of National Academy of Medical Sciences (India). He is the only 3rd engineer elected by this prestigious academy comprising top medical specialists in the country.

Editorial Boards:

Prof. Ruchi Anand, Department of Chemistry, has been invited to join the Advisory Board of Chemical Society Reviews journal of Royal Society of Chemistry (RSC) and inducted into the editorial advisory board of the most prestigious American Chemical Society (ACS) journal, J. Phys. Chem (A/ B/ C).

Prof. Sauvik Banerjee, Department of Civil Engineering, has been invited to join the Editorial board of the Journal Nondestructive Testing and Evaluation, Taylor and Francis as a Subject Editor, for period of two years.

Prof. Prasenjit Basu, Department of Civil Engineering, has been selected as an Associate Editor of "Journal of Geotechnical and Geo environmental Engineering (JGGE)-ASCE", published by American Society of Civil Engineers (ASCE), USA.

Prof. Deepankar Choudhury, Department of Civil Engineering, has joined as the Editor-in-Chief of Indian Geotechnical Journal (IGTJ), published by Springer, in association with IGS.

Prof. Guruswamy Kumaraswamy, Department of Chemical Engineering, has been appointed as an Associate Editor of the journal, Soft Matter, a reputed journal published by the Royal Society of Chemistry.

Prof. Naina Manjrekar, Department of Humanities and Social Sciences, has been invited to join the Editorial Board of Adam Matthew Digital, a SAGE publication.

Prof. Arpita Mondal, Department of Civil Engineering, has been appointed as an "Associate Editor" of the Journal Earth's Future of the American Geophysical Union (AGU) 2022.

Prof. Alok Porwal, Centre of Studies in Resources Engineering, has been invited to join the Editorial Board of Elsevier Journal "Ore and Energy Resource Geology" as an Associate Editor.

Prof. Alok Porwal, Centre of Studies in Resources Engineering, has joined the Editorial Board of Frontiers in Earth Science: Economic Geology Section.

Prof. Raaj Ramsankaran, Department of Civil Engineering, has been invited to join the Editorial Board of the journal Earth Science Informatics (ESIN), published by Springer.

Prof. Ashish Singh, Shailesh J. Mehta School of Management, has been invited to join the editorial board of PLOS Global Public Health as an "Academic Editor".

Prof. Riddhi Singh, Department of Civil Engineering, has been invited to serve as a Co-Editor for Hydrological Sciences Journal.

Other Recognitions:

Prof. Sauvik Banerjee and his PhD student **Mr. Paresh Mirgal**, Department of Civil Engineering, have won the ISNT-IXAR Best Paper Award in the Research and Development Category 2022 for their technical paper titled "Acoustic emission source modelling and classification in reinforced concrete beams", published in JNDE's, Vol. 18, issue 21, June 2020.

Prof. Varun Bhalerao, Department of Physics, has been awarded the Young Achievers Award by the Zee TV group in the field of science and technology (झी युवा सन्मान - विज्ञान आणि तंत्रज्ञान) 2023.

Prof. Deepankar Choudhury, Department of Civil Engineering, has been elected as a Fellow of the West Bengal Academy of Science and Technology (WAST).

Prof. Rodney Fernandes, Chemistry Department, has been selected for the Chemical Research Society of India (CRSI) Bronze medal.

Prof. Amol Gokhale, Department of Mechanical Engineering, has been selected to receive the "2022 IIM-Platinum Medal".

Prof. Haripriya Gundimeda, Department of Humanities and Social Sciences, has been selected for the Qimpro Platinum Standard 2022 Award under the category Environment.

Prof. Dipti Gupta, Department of Metallurgical Engineering and Materials Science, has been selected to receive the 'Women Involvement in Science and Engineering Research (WISER) Award' by the Indo German Science and Technology Centre (IGSTC).

Prof. Ashish Juneja, Centre of Studies in Resources Engineering) has won IGS-AIMIL Biennial Award - 2022 for paper on "Instrumentation" by Indian Geotechnical Society.

Prof. Shripad P. Mahulikar, Department of Aerospace Engineering, has been declared as the winner of the "Excellence in Aerospace Award" for the year 2019.

Prof. Samir K. Maji, Department of Biosciences and Bioengineering, has been selected to receive SASTRA-Obaid Siddiqi Award 2023 for excellence in Life Sciences.

Prof. Prakash Nanthgopalan and PhD scholar Mr. Nabodyuti Das, Department of Civil Engineering, are selected for "NSG Counter-IED Innovation Awards-2022" for their outstanding contribution in joint innovation of "Blast, Ballistic and Electromagnetic-Pulse Resistant Concrete (BBERC)". This award is given by the National Security Guard (NSG), Government of India.

Prof. Munukutla Radhakrishna, Department of Earth Sciences, has been selected for the National Geoscience Award 2019 for his significant contributions in the field of Applied Geophysics.

Prof. Balaji Ramakrishnan and his team, Department of Civil Engineering, has been selected for the "Marine Engineering Division Prize", by Institution of Engineers, India (IEI) under Marine Engineering category.

Prof. Ganesh Ramakrishnan Computer Science and Engineering and his team has been awarded by The 25th National E-Governance GOLD Award 2022, under the Category "Outstanding research on Citizen Centric Services by Academic/ Research Institution", for their work on Artficial Intelligence based Video Analytical Solutions for Safety, Security and Compliance monitoring.

Prof. Tathagata Pal, Department of Biosciences and Bioengineering, received the 'Best Impact Pitch Award' at the Prestigious IEEE Applied Sensing Conference 2023.

Prof. Gulab Singh, Centre of Studies in Resources Engineering, has been conferred the "National Geospatial Award for Excellence 2021" by the Indian Society of Remote Sensing (ISRS). This award has been given in recognition of his outstanding and pioneering contributions in the area of polarimetric synthetic radar remote sensing for monitoring the earth with the particular focus on its cryosphere and biosphere.

Prof. Parinda Vasa, Department of Physics, has been selected for Indian Physics Association Hema Ramachandran Lectureship Award for Experimental Physics 2022.

STUDENT ACTIVITIES

SPORTS COUNCIL

During the year 2022-23, the sports council conducted **Go Girls Go!** - workshops in sports like ultimate frisbee, table tennis, football, basketball, hockey and weightlifting to promote sports amongst women students of IIT Bombay. The sports council also conducted **'Happiness Bootcamp'** in collaboration with Bandhu to promote the importance of mental health in the Institute. To promote fitness, regular **zumba** sessions were held during June-September 2022 and in March 2023. **Open kickboxing and HIIT** demo classes were held to gauge the interest of students and staff in this fitness activity. After a positive response, regular sessions were conducted. The annual summer camp was held to help the students scout for talent for the 55th edition of Inter-IIT Sports meet.

Other events held during 2022-23 include farewell, PG sports orientation, PG sports mania, mini-convocation, General Championship (GC) opening ceremony, triathlon, treks, Run for Unity, Khasdar Khel Mahotsav Cyclothon, UG Freshmen Orientation and Freshiesta.

55th Inter-IIT Sports Meet

For the 55th Inter-IIT Sports Meet, the Sports Council conducted training camps for the contin-gent to ensure regular practice, proper nutrition for all potential players and staff members. The council organised the opening ceremony of the meet during which motivational speeches by sports officers and coaches on '100 Days to Inter-IIT Sports' were delivered and presentations on future outlook and plan-of-action for the sessions were discussed. To promote team-bonding among the contingent members, inter-IIT gala dinner was also organised. The team 'Bombay Blackcats' stood 5th in the 55th Inter-IIT Sports Meet (students) which was jointly held by IIT Delhi and IIT Roorkee at IIT Delhi and overall 2nd in the staff meet.

ABHYUDAY

Abhyuday, the social body of IIT Bombay, held the 10th edition of its annual social festival, "Socio-Weekend", during January 21–22, 2023, based on the theme "A Locus of Resilience". Prominent personalities from various walks of life graced the festival including Captain of the World Cup-winning Indian Blind Cricket Team Mr. Ajay Kumar Reddy; Consulting Editor of Times Now NavBharat Mr. Sushant Sinha; well-known gynaecologist in India Dr. Anjali Kumar spoke on women's health in the Her Health Demystified session; renowned cybercrime investigator Mr. Ritesh Bhatia spoke on the latest trends in cybercrime and ways to protect data and social media privacy, among others.

Mumbai Police and the Academy of Self-Defense organised a self-defence workshop with more than 100 participants learning new self-defence techniques. Clinical psychologist Ms. Pragya Lodha con-ducted an emotional quotient workshop where she spoke on ways to improve emotional health. The Rap Battle event had artists sharing their struggles through the modern art of rap and hip-hop.

Campaigns:

Clean-up Drives: Abhyuday team visited Versova Beach, Mithi River and Sanjay Gandhi National Park for the Clean-up campaign. The drive was conducted under the leadership of the UN Environment Champion of the Earth 16, Afroz Shah.

Career Counselling Campaign (CCC): More than 800 students across 20+ schools participated in the offline sessions on the career opportunities for students in several schools.

Masti ki Paathshala: More than 10 fun science experiments under 'Masti ki Paathshala' were con-ducted in various NGOs throughout Mumbai.

RobinHood Army Food Distribution Drives: The Abhyuday team has been able to make a small but meaningful impact in fighting hunger and food waste, while also promoting the values of community service and empathy among people.

Powai Lake Cleanup Drive: A clean-up drive at Powai lake was organised on the World Environ-ment Day celebrated on June 5, 2022. More than 200 volunteers participated in the drive and about 2.5 tonnes of waste was collected on a 2 kms stretch to execute Powai lake cleanup and awareness campaign.

Events and Fellowships

DIY Central Perk: 150 participants made cat houses, dog houses, chairs and tables from waste materials during the D.I.Y. (Do It Yourself).

Blood Donation Drives: Abhyuday and Sthaniya Lokadhikar Samiti with support from Blood Bank K.E.M. Hospital conducted two blood donation drives. About 600+ units of blood having the potential to save whooping 1800+ lives was collected.

Aadrai Jungle Trek cum Medical Camp: A medical camp for a village at the base camp of Aadrai was organized from the funds raised from the trek. 100+ students from IIT Bombay participated in the trek cum medical camp.

Sandesh to Soldiers: This was organised on the occasion of 75th Independence Day in all hostel messes to let the students express their love, emotions and sentiments for soldiers and policemen.

Coordinators' All Team Meet, Freshers' Orientation and PG Orientation: It aims to introduce UG and PG freshers/ sophies to programs and initiatives of Abhyuday.

Profectus: The fellowship program was launched in June 2022 and month-long internships were pro-vided during summer vacations. Provided 70+ internships across 20+ NGOs and social startups in 70+ different profiles.

Competitions:

Pehchan - Slum's Got Talent: This talent showcase competition for underprivileged students consists of dance, singing, painting competitions and plays.

Action Plan Social Entrepreneurship Competition: This competition challenges youth across the country to come up with feasible and optimistic solutions to tackle social issues present in our society across 6 sectors - education, agriculture and rural development, sustainable energy, women empower-ment, finance, technology and healthcare.

TECHNICAL AFFAIRS

- **Institute Technical Summer Projects (ITSP):** This 3-month intensive program saw the participation of 130+ teams. 40+ projects from various domains of AI, AR-VR, mechatronics, aerial robotics, biotechnology, market analysis, agriculture etc., were completed. The top six teams were awarded tech vouchers worth Rs 30,000 and four special mentions. Prof. R. K. Pant distributed a certificate of mentorship and participation at the closing ceremony of ITSP. The event was a success, with an overall year-on-year increase of 80%.

- **Inter IIT Tech 11.0:** Inter IIT Tech 11.0 was held during February 11-12, 2023 and hosted by IIT Kanpur in hybrid mode. IIT Bombay's contingent participated in 13 problem statements and secured 1 gold, 6 silver and 1 bronze medal and an overall 4th position among all the participating IIT's.

- **Founders' Garage:** Institute Technical Council (ITC), in collaboration with E- Cell, launched Founders' Garage 2022 to turn a project/ prototype into a product.

- **Tech & RnD Expo:** This two-day event, held during October 15-16, 2022 showcased the mind-blowing work done by various tech teams and projects of independent students from the Institute. Industrial talks on topics like digital health, battery technology, product technologies and workshop by e-Yantra as well as VR gaming, drone flying and walking water pool were included for the first time. More than 30 company representatives and alumni visited the expo. The event saw 10K+ visitors including students, faculty, alumni and industrial personalities.

- **Industry x Tech (IxT) Series:** This new initiative in collaboration with IIT Bombay Research Park launched industry-level projects, problem statements and challenges. As of now, there are two collaborations, first with ideaForge and second with CTech Labs.

- **ITA Awards:** ITC felicitated a few students who had shown extraordinary contributions to tech in the year just before Covid.

- **PG Tech Weekend:** The diversity of students here provides a challenging yet interesting opportunity to design and execute events and activities for participants with different levels of expertise and varied motivation. ITC conducted PG-Tech weekend during October 1-2, 2022, according to the research interests of the PGs. ITC team conducted talks by industry leaders like the EV Tech Industry Talk along with workshops and hackathons like Debriefing Data, Code On and Let's Think Reverse workshop.

- **Tech Mentors:** A tech mentor will be a first-hand guide to the fantastic journey of tech await-ing at IIT Bombay. With this aim, ITC introduced a first-time Tech Mentor Program in UG ori-entation 2022. More than 450 freshers showed their interest. The objective of the programme was:
  - o To help first-year undergraduate students understand the challenges and opportunities in tech present at IIT Bombay
  - o To provide positive role models to all undergraduate students in the Institute
  - o To provide senior guidance to freshman students and help them excel in technology

  A list of tech mentors who have been previously involved with the tech community were selected.

- **Learners' Space:** In its sixth edition, Career Cell, with the help of ITC, conducted Learners' Space in a revamped Summer Online Material

Course format on MoodleTM to streamline the logistics of the courses and improve assessment of progress.

- **Student Wellness Center portal:** The web team of ITC created an EMR website for the Student Wellness Center. It contains a student and counselor interface, where students and counselors can log in using LDAP and Google authentication respectively. The portal is used for scheduling appointments in the Google calendar and sends an automated mail of the appointment and also takes a record of all previous appointments and prescriptions. It allows counselors to take notes, write descriptions and upload psychometric assessments.

- **Devcom:** Envisioned as a group of the best developers in the Institute, the team is responsible for developing and maintaining InstiApp, Resobin and other dev/ tech related projects in the Institute.

    o **Mess-i inHostel** - Implemented the mess digitalization system in nine hostels along with integration of rebate into the system.

    o **MRSP** - The Married Research Scholar portal's development has been completed.

    o **Resobin** - Established it as the central resource repository with UGAC to help students to access all the resources available for the courses and also updated the my timetable features.

- **InstiX:** InstiX is a student body building hardware-based product deployable in the Institute, which could help solve some prevalent problems. They worked upon entry-exit system, water monitoring system, inter-hostel registers and food wastage monitoring system.

- **Clubs and Communities** - The 10 clubs under ITC along with communities like CDS-SRG, Ham Radio club and some newly formed communities like Cyber Security and Health Care Student community organised a variety of events. Some clubs started their own Podcast series while others participated in national competitions. All the clubs conducted their Orientation to interact with the UG, PG first-year students and to showcase them the glory of tech-end. Most of the clubs revamped their websites to improve presentation and make club-related info more accessible for all. The Instagram and Facebook series were launched by various clubs which includes quizzes, general informative posters etc. Group discussions were held as a continuing tradition to promote knowledge sharing. The clubs launched various projects to engage the students productively during the holidays.

- **DisruptIQ:** ITC organized a closed community session in collaboration with Desai School of Entrepreneurship for the Tech teams and clubs to help them understand the business-side and market analysis of all the products and prototype the manufacture for their competitions and also help them to understand the advantages and process of patenting of their innovative ideas and products.

TECHFEST

IIT Bombay's annual science and technology festival 'TechFest' was held during December 16-18, 2022, catering to a crowd of over 1,75,000 on the grounds of IIT Bombay, attracting participants and audiences not only from the country but all around the world. Some of the highlights of the fest were:

Launch of 5G: Jio launched 5G for consumer testing and usage in India at Techfest. This led to IIT Bombay becoming the first 5G-fied campus in India. The attendees were provided free 5G Internet throughout the IIT Bombay campus for the entirety of the fest.

Lectures:

Some of the prominents speakers during the lecture series were **Honorable Tarja Halonen**, the first woman to hold the President position in Finland between 2002 and 2012; **Mr. Suresh Prabhu**, former Indian Railway Minister; **Ms. Kathryn Lueders**, Associate Administrator of the HEO, NASA and many others.

International Exhibition

Techfest projected some of the best and most unique innovations in the field of science and technology like **BrahMos** - The world's fastest Anti-Ship Cruise Missile; **Formula E** M8 Electro Gen2; **Unitree GO1**- The World's First Intelligence Bionic Quadruped Robot; **ISRO** - Indian Space Research Organisation and many more.

Drone Light Show:
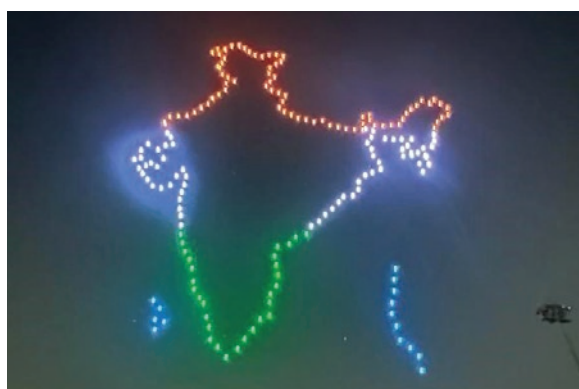
Techfest organized a **Drone Show** with over **250+ drones** making multiple formations. Being only the **third time** that this happened in **Mumbai** on the grounds of IIT Bombay. The footfall for the show was over 20,000.

Techfest Drone Racing League:
Techfest, for the first time in its history, successfully conducted the Techfest Drone Racing League. Being one of the most elite extravaganza events of Night Drone Racing, an audience of over 5000 people witnessed the drones slicing through the air with absolute speed to win prizes worth Rs. One lakh.

E-CELL
The Entrepreneurship Cell IIT Bombay is among the forerunners in promoting entrepreneurship in the nation. It is Asia's largest non-profit student-run organization that aims at manifesting the latent entrepreneurial spirit among the youth of this country. Some of the initiatives of E-Cell, IIT Bombay include Eureka!, National Entrepreneurship Challenge, Eureka! Junior, E-Summit, among many more.

Eureka!
Being Asia's largest business model competition (accredited by CNN and Thomson Reuters), Eureka! prides itself on providing a 360-degree holistic experience in its five-months spans. This platform has everything from acknowledging students idea's potential to drafting a B-Model and pitching it to an esteemed panel of investors! E-Cell IIT Bombay initiated a collaboration with Gulf Islamic Investments LLC (GII) to form Eureka! GCC, a model of Eureka! that caters to startups from the GCC re-gion. As an incentive, the winners of Eureka! '21 were allowed to pitch their ideas at Dubai Expo '22. Eureka! '22 received over 15,000 registrations from across India. The best startups of Eureka! '22 were Nimble Growth Organics (Business), Vigyos (Fintech), P-TAL (Social), Cattleguru Private Limited (Pan IIT), DocHome (Healthcare) and Serri (Web 3.0).

E-Summit

E-Cell hosted the 18th edition of E-Summit, IIT Bombay's annual entrepreneurship summit, during January 28-29, 2023. The event drew participants from across the country, including students, entrepreneurs, industry leaders, investors and aspiring entrepreneurs, making it a national event. The event's footfall was estimated to be 45,000 over the two days, with the highlighted events being streamed live on JioTV.

The team of E-Cell IIT Bombay celebrated its silver jubilee in 2023. The theme of E-Summit 2023 was "Inception Of Innovation", which emphasized that the event aims to implant the entrepreneurial mindset in the leaders of tomorrow. Tens of hundreds of startup founders, budding entrepreneurs and students attended the event offline. For some, it was a conclusion; for others, it marked a beginning.

A series of speaker sessions with esteemed personalities included Mr. Kishore Jayaraman, president of Rolls-Royce for India and South Asia; Mr Lalit Keshre, Co-Founder and Chief Executive Officer at Groww; Ashneer Grover, Co-founder of BharatPe; Mr. Asit Kumarr Modi,

creator of the famous show Taarak Mehta ka Ooltah Chashmah; Jaya Kishori, spiritual orator; Shri Gauranga Das, ISKCON GBC and Director of Govardhan Eco Village (GEV); actor Amrita Arora and RJ Anmol of Couple of Things fame; CEOs of over ten Indian unicorns, among many others. Their talks were incredibly motivating that provided valuable insights and knowledge to young, new and budding entrepreneurs. The E-summit saw a plethora of events, including workshops, networking, on-spot funding events, competitions and a startup expo. The workshops provided attendees with hands-on experience in finance and marketing. The networking opportunities allowed participants to interact and connect with other entrepreneurs, investors and industry professionals, fostering collaboration and growth. TTMM (The Ten Minute Million), Networking Arena (NA), Seedstars, I-Hack, Incubators Summit, Startup Expo, RND Conclave, Internship and Job Fair and numerous others were some of the events that were conducted, each specifically de-signed to cater to a certain audience.

One of the key highlights of the E-Summit was The Ten Minute Million (TTMM), an on-the-

spot funding event where startups could pitch their ideas to investors and secure funding for their ventures. Many talented entrepreneurs presented their ideas during the 10th edition of the competition, in a bid to make their ideas into reality. Four of the eight pitching startups that received funding include Kapow, Cheerio, Ironbox and Sypto.

The Startup Expo showcased several innovative products and services from startups spanning beginners to those well established in the market. The expo gave attendees the opportunity to interact with the founders and understand their products, services and business models as well as a platform for the startups to interact and gain feedback with potential customers.

E-Summit Chapters

This year E-Cell conducted the E-Summit chapters in the megacities of Delhi, Mumbai, Pune, Hyderabad, Bengaluru, Kolkata and Ahmedabad.

Events included:

- The Networking Arena (NA) where the founders get the chance to meet and network with investors and mentors
- The startup expo, which is a unique opportunity to showcase ideas and venture to an enthusiastic audience and future customers or investors
- Workshops covering multiple dimensions of business
- Various competitions

Origins

Origins was conducted this year to celebrate the 25th year of E-Cell and to launch the E-Summit 2023 dates. The event was conducted in Open Air Theater and attracted a larger audience. The E-Summit dates were launched by actor Katrina Kaif.

MOOD INDIGO

Mood Indigo (MI) 2022, IIT Bombay's annual cultural festival and Asia's largest college cultural festival took place during December 27-30, 2022. Attracting a footfall of over 1,50,000 people from around 4000 colleges pan India. Artists and performers were invited from across the globe and it evolved to be a platform for global cultural interaction. The four-day fiesta centered around the theme of **"Reverie of Exuberance"** served the visitors with the best festive feelings.

The 52nd Edition of Mood Indigo was a revolution in the domain of pop culture with a fresh dynamic outlook. The days leading to the fest saw some exciting events like Institute Nite, Paw Fiesta, Multicities, Livewire, Hysteria. The dates for Mood Indigo 2022 were announced in a spectacular fashion, with Bollywood stars **Ranbir Kapoor** and **Alia Bhatt** launching the dates during the Institute nite. Events like Coordinator's All Team Meet featuring singer and actress Shirley Shetia were organized for the sophomores to introduce them to Mood Indigo.

Proshows: This year, as part of Eloquence, Mood Indigo had the legendary actress, **Vidya Balan** in conversation with Rajeev Masand, the Michelin-star chef, **Vikas Khanna** and veteran actor **Vikrant Massey**. The talks with these eminent personalities were quite illuminating and captivating.

The **Humor Fest** Headliners included comedy sensations such as **Samay Raina** and **Anubhav Singh Bassi**. Their delivery, personality, anecdotal

content and apt punch lines made everyone laugh their hearts out!

Various highly insightful and engaging talk sessions were organized like "Women for future" with **Avanti Nagral** and **Aarya Jadhao**, "Adulting with the Stars" with prominent content creator stars **Ayush Mehra, Barkha Singh, Viraj Geelani, Revathi Pillai, Vinay Pillai.** Teams of some popular TVF series like "TVF Pitchers" with **Abhay Mahajan, Arunabh Kumar, Ridhi Dogra, Naveen Kasturia a**nd "TVF sixers" with **Chaitanya Kumbhakonum, Badri Chavan** and **Shivankit Singh Parihar** attended.

MI Studio consisted of musical evenings at the Convocation Hall. Singer **Nikhil D'Souza** stole the night away with his eclectic acoustic guitar-based pop music. In the classical afternite, we had **Anirudh Varma Collective**, a classical fusion band. The International Music Festival had crowd rel-ishing the performances from **international artists** and bands like Einar Stray Orchestra, an exuberant Indie band from Sandvika in Norway and Musa, a great name in the Mandarin and Cantonese Pop music scene.

Indian youth sensations like Akash Ahuja, Chirag Todi, The Lost Symbols, Ashu Shukla and multi-platinum artist and entrepreneur **Ananya Birla** amazed the crowd with their brilliant performances.

Pronites: Indian music composers, producers, singers and songwriters **Vishal Sheykhar** featured in the Popular Nite Headliners. Their energy, passion and talent lit the event. The Euphonic Nite was headlined by another star **Sunidhi Chauhan**. For EDM night on December 27, 2022, the Norwegian DJ **Martin Tungevaa**g, Indian EDM Artist Ravator set the stage ablaze along with **Shilpa Rao** and **Anand Bhaskar**.

Competitions:
Mood Indigo had variety of 60+ competitions spread across 9+ genres. The grandest dance competition 'Choreonite' saw thousands of people lining up outside the Convocation Hall. Various competitions in the classical and folk art genre were also introduced. All the finalists of the prime events like Desi Beat, Beat the Street, Chosen One, Humor Us, MI Idol, Conchord etc. got to perform before Bollywood actor Gurmeet Choudhary, the chief guest.

Media and Publicity:
A great deal of media houses and online and offline partners helped in carrying out the publicity of the festival. The event were extensive covered by media partners on all platforms including TV, Facebook, Twitter and Instagram. Associations with local newspapers and magazines helped the students in penetrating into regions where Mood Indigo wasn't present before. A newsletter, named Mirage was published in association with The Free Press Journal, which was distributed in over 60,000 households in Mumbai. The college publicity drive was revamped to reach out to the various colleges in Mumbai and also for the first time in Pune. The Media Team continued other avenues of publicity like outdoor hoardings and multiplexes.

Social Cause:

This year Mood Indigo abided by The Green Oath. MI aimed to make the fest zero-waste, by ensuring reduction of the waste at its source and proper segregation of the generated waste with the help of Sony BBC.

TEAM YOGASTHA
Yogastha, the wellness team of IIT Bombay, conducts one-hour morning yoga sessions (6:30

AM - 7:30 AM) thrice a week to not only maintain physical health but also to equip the students with mental peace to carry on the day's activities with zeal and vigour.

Yogastha hosted a 2-day "Yoga for Health" workshop with Ambika Yoga Kutir during April 8-9, 2022. The workshop taught the participants about pranayama, sukshma vyayam and stress management through yoga. The instructor was an expert in the yogic management of various diseases. The workshop was a great learning experience for the participants.

The following activities and sessions were conducted as part of International Day of Yoga 2022:

- **Hatha Yoga and Pranayam Workshop** on May 17-19, 2022 by Dinesh Mulchandani.
- **ACU Yoga Workshop** on May 21, 2022 by Shrikant Kshirsagar and Mangesh Sardeshpande.
- **Mini-Yogathon** by Shashi Bhushan on May 22, 2022.
- **Yoga Paid Camp** on basic Yoga and strategies by Rohit Pillai during May 23-27, 2022.
- **Spine Care and Women Wellbeing** during May 31 to June 1, 2022 by Dr. Kalpana Godbole.
- **Yoga for Wellbeing** event held by Savita Parikh during June 4-5, 2022.
- **Use of Mudras in Pranayama** on June 12, 2022 by Devang C. Shah.
- **Practice sessions** of Yogathon and CYP before IDY.

The following **competitions** were held on the same occasion:
- 2 min Yoga Challenge, Pose a Challenge and Online Quizzes.
- Best Yoga Pose Competition, Slogan Competition and Poster Making Competition.

International Day of Yoga (IDY) 2022:
Common Yoga Protocol (CYP):
Yogastha marked the International Day of Yoga with a 45-minute Common Yoga Protocol (CYP) session on June 21, 2022. The session was led by Shashi Bhushan. More than 150 participants joined the session. Renowned Neurosurgeon and yoga therapist Dr. Mayur V. Kaku, was we invited guest.

Yogathon (108 Surya Namaskar Challenge):
Yogastha organized Yogathon (108 Surya Namaskar Challenge) on June 21, 2022 to celebrate the International Day of Yoga. More than 120 students and campus residents joined the challenge.

PG Orientation
Yearly Orientation conducted to inspire, enrol and enlist enthusiastic students into the Yogastha family. A great number of new participants showed interest and continued participating throughout the year.

Mind Mastery Workshop
Conducted in Aug 2022, Dr. Kush Panchal spoke about study techniques, stress management and meditation techniques. This event was conducted around mid-sem exams, saw a high attendance from students who found it to be very beneficial.

Learn to Reverse Chronic Diseases Naturally
The event included discussion on prevention and reversal of chronic diseases was organise on October 1, 2022. The discussion was led by Mr. Lalit Kapoor, a 1971 B.Tech graduate from IIT Kanpur, gave various insights about the lifestyle changes to be made and habits to be formed to transform ourselves to our best state of health potential.

Posture Alignment Yoga Workshop
A workshop on Posture Alignment was organised by Yogastha on October 7, 2022. The workshop was led by Subhash Chandra Naik, a famous yoga teacher and former dancer.

The Five Tibetans Yoga Workshop
The workshop was held on October 14, 2022. The workshop was instructed by Mr. Rohit Pillai, who spoke on balancing Chakras and

energy, along with improving digestion, eye-sight and calmness in mind.

Mini-Yogathon

Mini- Yogastha's challenge on October 15, 2022 was preceded by warm-up practice sessions during October 12-14, 2022. Winners were gifted rewards and everyone was familiarised with the proper form of Surya-namaskara. A total of 54 Suryanamaskar challenge was given to the participants.

Lifestyle Engineering and UG freshers Orientation

This session, conducted on November 19, 2022, engaged UG freshers and introduced the participants to Yogastha and its activities. Mr. Anurag Pareek explained the benefits of yoga.

Yogic IKIGAI and Life, along with Yogic Panchsutras

A talk session by Dr. Vikas Chothe, an Ayurvedic doctor and a Yoga Ambassador was held on November 26-27, 2022. Dr. Chothe shared his insights on the meaning and purpose of life and the reasons for being. The session also included a yoga workshop which helped the participants to connect with their inner selves and find their true potential.

Meditation Marathon

Dr. B.K. Bandre and Rahul Taparia from always live yoga held an online session on December 3, 2022 on the benefits of deep meditation. Participants were able to meditate for an hour under their guidance.

Sahaja Yoga Workshop

The trio of Dr. Sandeep Rai, Dr. Madhur Rai and Dr. Devdutt Rai conducted a workshop on "Simple Yoga and Meditation" and demonstrated and taught how it can be integrated into daily life on January 14, 2023.

Increasing Concentration and Focus of the Mind

On January 29, 2022, Yogastha organized a session with Dr EV Swaminathan, a Corporate Trainer and a Spiritual Expert, who shared practical tips and techniques to enhance concentration and focus. He also provided strategies to manage distractions and stay motivated, which are essential for success in any field.

Mini-Yogathon

Yogastha Organised a Mini-Yogathon of 72 rounds of Suryanamaskara on February 11, 2023, with three preceding classes of practice. A high number of participants showed up, and exceptional performers were awarded special prizes.

PLACEMENT

IIT Bombay had 2174 students registered for the campus placement season from July 2022 - June 2023 of which 1845 students actively participated in placements and 1516 students secured jobs, which is the highest number to date. The placements were conducted in a hybrid mode comprising of interviews. 1316 Job Announcement Forms were filled by 531 companies this year, excluding the pre-placement offers. Highest international and domestic salaries (based on cost to company (CTC)) at IIT Bombay were Rs. 3.67 crore per annum (CPA) and Rs. 1.68 CPA, respectively. Sixteen offers of above Rs. 1 crore per annum and 65 international offers were accepted at IIT Bombay during the placement season 2022-23. Of the 300 pre-placement offers 194 offers were accepted by students at IIT Bombay. The average salary of the students placed this season was Rs. 21.82 Lakhs per annum (CTC). The placement season is summarized in Table 1.

Table1: Highlights of Placement Season 2022-23

Key Metric	Details
Number of Registered Students	2174
Number of Students who Actively Participated	1845
Number of Companies Participated	384
Total Number of Companies Making Job Offers	324
Total Number of Job Offers	1898
Number of Accepted Offers	1516
Number of Pre-Placement Offers	300
Pre-Placement Offers Accepted	194
Job Offers above Rs. 1 crore Accepted	16
International Job Offers Accepted	65
Highest International Salary	Rs. 3.67 crore
Highest Domestic Salary (CTC)	Rs. 1.68 crore
Average Salary Package of Selected Students	Rs. 21.82 Lakhs per annum
Top Recruiting Sector	Engineering and Technology

Student preparations

Keeping the students well prepared for what they are likely to face in the corporate world is the responsibility of every academic Institute. Students undergo challenging coursework and are exposed to research-based projects, along with a host of sports, cultural and organizational activities on the vibrant IIT Bombay campus. Through the placement cell, students at IIT Bombay secure internships in top-rated companies and universities, not only preparing them for higher studies and/ or industry jobs but also often resulting in pre-placement offers. The placement team at IIT Bombay takes every necessary step to train and equip students to succeed in securing the best jobs available for graduating students. In this endeavour "Boot Camps" were held in collaboration with Career Cell. In addition, preparatory programs were conducted to enhance the communication skills, group dynamics and interview skills. Overall, these programmes provided an insight into the job domains and also prepared the aspirants for the various selection rounds conducted by companies. The students were assigned mentors for guidance and a series of aptitude tests were conducted to improve their problem-solving skills. The preparatory activities sourced information from various alumni, where the alumni background was mapped according to student preference. Various department-level activities were also conducted to strengthen core domain expertise of the students. Overall, various training programs for students were conducted by the placement team contributed to a successful placement season.

Recruiter's Profile and Overall Statistics:

This year, 65 international offers were made to IIT Bombay students from different firms based in the USA, Japan, United Kingdom, Netherlands, Hong Kong and Taiwan. Due to the war in Ukraine and the subdued global economy, number of international offers were similar to last year. The average package offered during IIT Bombay placement season 2022-23 stood at Rs. 21.82 LPA in comparison to the average packages in 2021-22 and 2020-21 which

were Rs. 21.50 LPA and Rs. 17.91 LPA, respectively. The engineering and technology sector recruited the highest numbers of students. In various engineering domains, 458 students were selected in 97 core engineering companies for positions at the entry-level. Information technology and software hiring was less this season compared to last year. Nevertheless, around 302 students were offered IT/ software jobs by over 88 companies, making the IT sector second larger recruiters after the engineering sector. Over 154 consulting offers were made by 29 consulting companies. Trading, banking and fintech companies were also prominent recruiters. 76 offers were made by 32 financial service firms this year. Profiles in artificial intelligence, machine learning, product management, mobility, data science and analytics and education also saw brisk hiring trends. Nineteen design companies made 33 job offers. The education sector saw seven companies participating with 81 jobs offered.

The research and development sector witnessed companies in automation, energy science, battery technology, chemical and mechanical research, energy efficient solutions, application development, materials research, power electronics, AI/ ML and research laboratories, where 30 organizations offered 92 positions in 2022–23. Table 2 lists the total number of offers and number of pre-placement offers made and accepted in 2022-23. The sector-wise distribution of companies making offers and number of accepted offers are listed in Tables 3 and 4 as well as Figure 1.

Table 2: Pre-placement and total offers received and accepted in 2022-23

Year	Pre-placement offers		Total Job offers	
	Received	Accepted	Received	Accepted
2022-23	300	194	1748	1516

Table 3: Distribution of offers from different sectors (includes PPOs)

Sector	Number of Offers	Number of companies
Analytics	79	21
Consulting	154	29
Data Science	25	13
Design	33	19
Education	81	7
Engineering and Technology	458	97
Finance	76	32
IT/ Software	302	88
Public Sector Undertaking	14	4
Research and Development	92	30
Services	9	4
Others	193	59
Total	**1516**	**403***

is not total number of companies as some companies have made offers in multiple sectors
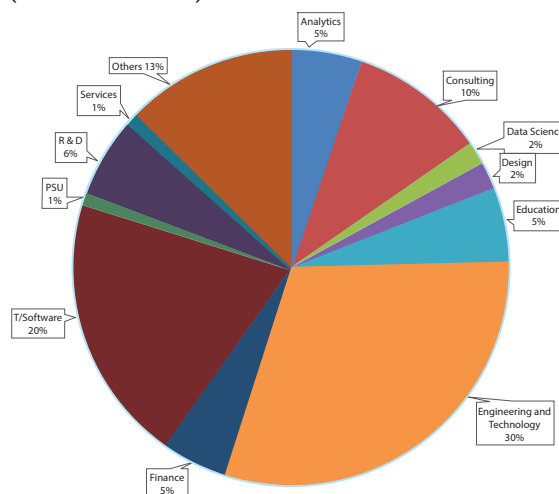

Figure 1. Distribution of offers made in different sectors

Programme-wise placement statistics

Overall, 82 percent of the students who actively participated in placement season 2022-23 were successfully placed. From students registered in the BTech, Dual degree and MTech programmes, close to 90% of those participating in placements were able to secure jobs. Placement percentage in

programmes other than those mentioned above was close to 65%, except for the PhD program. Though the placement percent of PhD students was low, there was a healthy increase in number of students place from this programme. All students registering for placements do not necessarily participate actively, opting for higher studies.

Also, students also got placed through channels other than campus placements. The programme-wise placement data is provided in Table 4 and Figure 2. The count of students participation excludes students who opted for higher studies or had other career options and hence de-registered from the placement process.

Table 4: Programme-wise placement data 2022- 23 (including PPOs)

Programme	Registered	Participated	Placed	Percentage placed
BDes	23	12	7	58
BS	57	43	39	90
BTech	791	679	598	88
Dual Degree (BDes + MDes)	10	9	8	88
Dual Degree (BTech + MTech)	215	187	178	95
MDes	76	63	39	61
MPP	12	9	6	66
MSc	214	159	110	69
MTech	583	532	479	90
PhD	166	131	41	31
Others	27	21	11	52
Grand Total	**2174**	**1845**	**1516**	**82**

Includes Dual (BDes + MDes), Dual (BS+MS), Dual (MSc + PhD), Dual (MTech + PhD), MPhill, MS by Research (Exit)
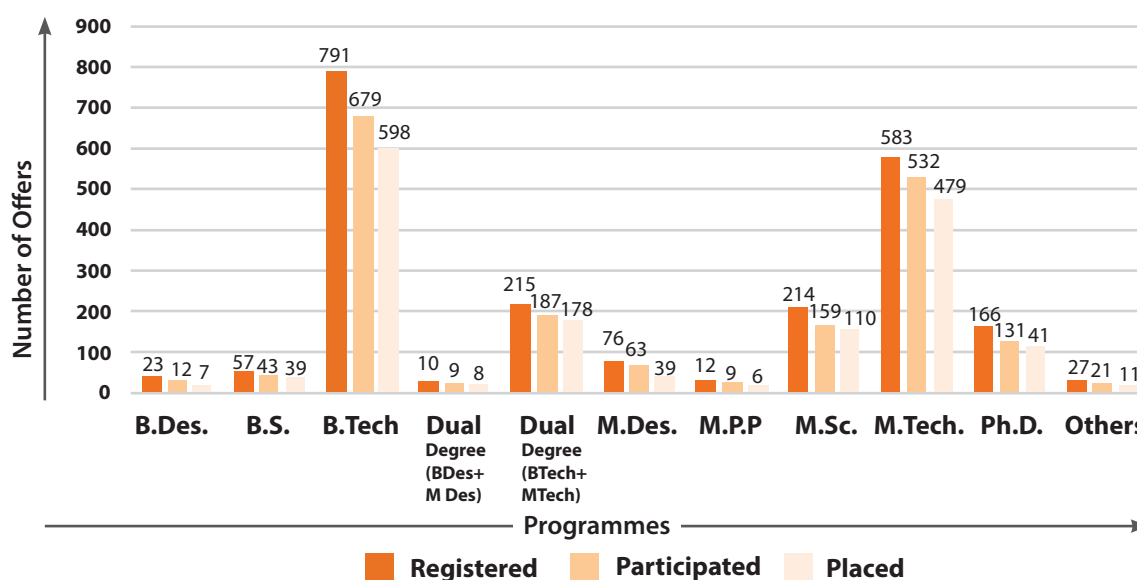
Figure 2: Programme-wise placement in numbers

Department-wise placement statistics

IIT Bombay has 16 different departments, spanning various undergraduate, postgraduate and doctoral degree programs. Along with these departments, several interdisciplinary schools and focused research centers also offer Bachelor+Masters (Dual Degree), Masters and PhD degrees. Student's may also earn an honors degree from their parent department and/ or a minor degree from another department/

centre by taking extra credits. The placement team endeavors to attract companies from core as well as non-core sectors for students. The placement statistics of students from all programmes for major departments/ centres during the placement season 2022-23 is compared with placement data from the preceding two years and shown in Table 5 and Figure 3. The placement numbers continue to be strong across departments.

Table 5: Department-wise classification of offers

Departments	2020-21	2021-22	2022-23
Aerospace Engineering	54	76	78
Applied Statistics and Informatics	23	29	26
Biosciences and Bioengineering	5	7	33
Chemical Engineering	89	135	141
Chemistry	10	17	35
Civil Engineering	98	99	129
Computer Science and Engineering	199	236	228
Earth Sciences	12	13	17
Electrical Engineering	220	257	214
Energy Science and Engineering	29	32	40
Industrial Design Centre	69	56	54
Mechanical Engineering	151	180	191
Metallurgical Engineering and Materials Science	90	127	131
Physics	1	1	17
Other Programs	91	176	182
Total	**1141**	**1441**	**1516**

Figure 3.: Department-wise classification of offers

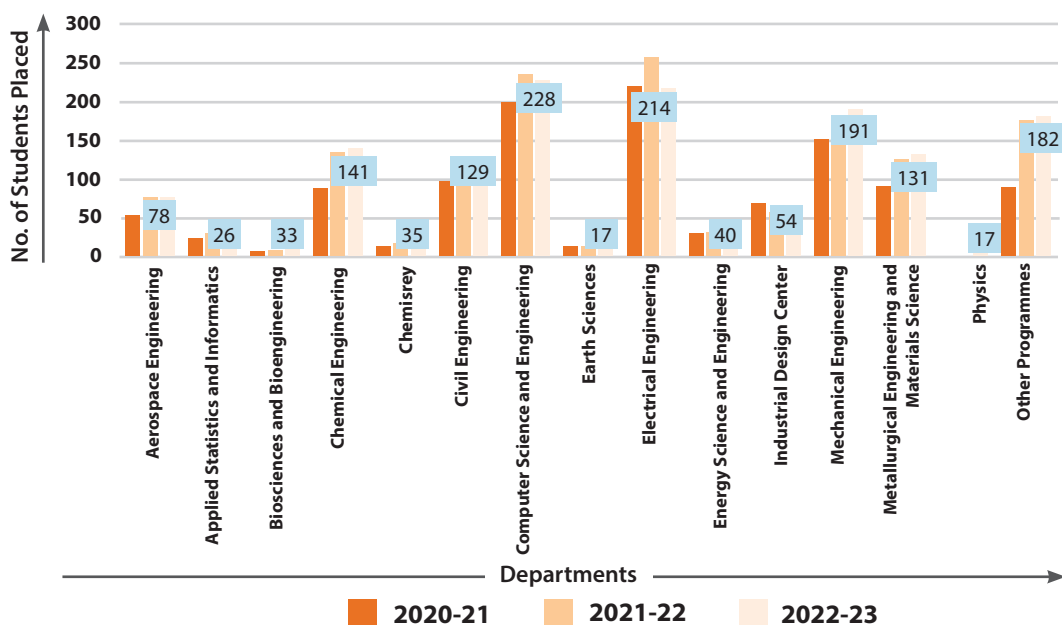## Salary-wise statistics:

The job offers by recruiting organizations are categorized based on the gross compensation packages. Factors other than compensation package, such as job profile, past association etc. may sometimes influence students choice of a company. Salary-wise classification of total offers made in the year 2022-23 is shown in Table 6 and Figure 4.

Table 6: Placement details based on compensation including PPOs

Range of gross salary (in Rupees) (Lakhs per annum)	Number of Offers	Number of Companies
Above 16	563	130
Between 13.5 to 16	229	65
Between 11.5 to 13.5	261	65
Between 9.5 to 11.5	142	42
Between 7.75 to 9.5	149	33
Between 6.25 to 7.75	72	25
Between 5 to 6.25	99	12
Between 0 to 5	1	1
Total	**1516**	**373***

is not the sum total of companies as some companies may have given multiple jobs in different salary bands
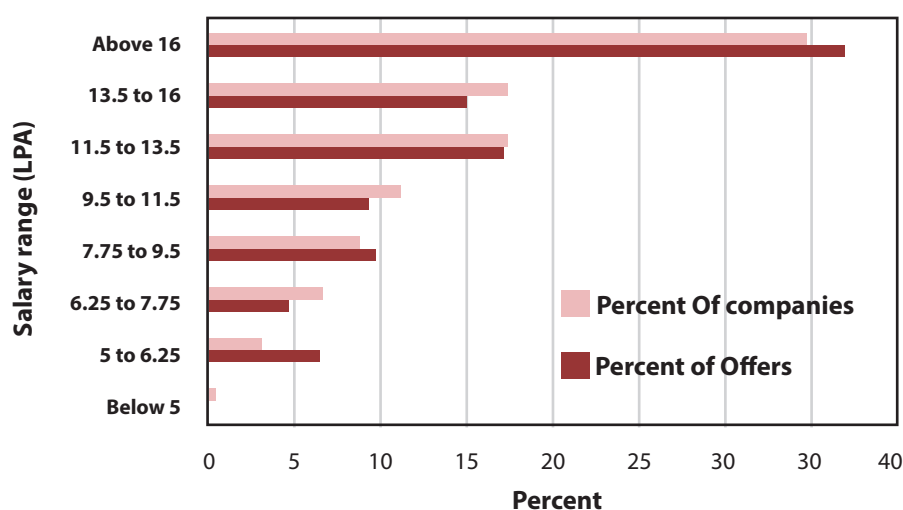
Figure 4: Compensation-wise distribution of offers. (in Rs. Lakhs Per Annum)

Comparison of average salary, international and pre-Placement offers:

The average gross salary offered was Rs. 16.66 LPA and the average salary (based on CTC) was Rs. 21.82 LPA. The number of Pre-Placement Offers (PPO) was 194, while the number of international offers was 65. This suggests an increasing and a positive trend in the pay package offered by various organizations as can be seen in Table 7. The distribution of oversees offers as well as MNCs and Indian companies is listed in Table 8.

Table 7: Average salary, international and Pre-Placement Offer details

Description	2020 -2021	2021-22	2022 - 2023
Average Gross Salary (in LPA*)	13.67	16.50	16.66
Average CTC (in LPA*)	17.91	21.50	21.82
Number of International Offers	58	66	65
Number of Pre-Placement Offers	149	201	194

LPA–Lakhs per annum (in rupees)

Table 8: Placement statistics based on Company Type / Geography

Placement statistics based on Company Type / Geography	Number of students
Placement Outside India (International Location)	65
Placements in MNC's in India	790
Placements in Indian Companies	661
Total	**1516**

Year-wise comparison

Despite the challenging market situation this year, IIT Bombay continued to be the preferred institute for most of the top firms. Table 9 and Figure 5 show the comparison of students placed over the last three years from the major degree programs.

Table 9: Comparison of the number of students placed in the last three years

Programme	2020-21	2021-22	2022-23
BTech	468	544	598
Dual Degree (BTech+M Tech)	132	184	178
MTech	406	523	479
Others	144	190	261
Total	**1150**	**1441**	**1516**

Figure 5: Compensation of the number of students placed in the last three years

Sector-wise statistics for different programmes: BTech and MTech students maintained almost the same demand amongst companies of various sectors. Sectors such as Engineering and Technology, IT/ Software, consulting and research and development continued to recruit a large fraction of the graduating batch of students. Sector-wise statistics for different programmes are shown in Table 10.

Table 10. Sector-wise number of offers for different programs

Sector	BTech	Dual Degree	MTech	Other Programmes	Total
Analytics	36	14	17	12	79
Consulting	75	28	33	18	154
Data Science	7	3	11	4	25
Design	1	3	4	25	33
Education	5	1	21	54	81
Engineering and Technology	129	58	213	58	458
Finance	52	12	1	11	76
IT/ Software	156	32	95	19	302
Public Sector Undertaking	4	2	4	4	14
Product Management	10	4	2	3	19
Research and Development	27	14	37	14	92
Services	5	0	4	0	9
Others	91	20	37	26	174
Total	**598**	**191**	**479**	**248**	**1516**

PhD student placement

The PhD student placement details are as below:

- Total number of registered students :166
- Number of active participants :131
- Total number of accepted offers: 41
- Highest Salary (CTC) from allocated offers (in INR): Rs. 29,00,000

- Average CTC from allocated offers (in INR): Rs. 18,34,000
- Percentage of offers to active applicants: 31.66%
- Percentage increase from last year: + 34.16%
- Table 11 compares the recruitment for the past 3 years.

Table11: PhD Students recruitment comparison for last three years

Academic Year	2022 – 2023	2021 – 2022	2020 – 2021
Total Participated	131	67	76
Total Placed	41	30	14

Internship Report 2021-22

Pre-final year students have been offered Pre-placement Offers (PPOs) at the end of their internship term. PPOs at IIT Bombay have improved this year. Recruiter interest was highest for Computer Science and Engineering with most openings in advanced software programming in Big Data, IoT, AI and ML, R&D and Consulting. It is expected that the rising PPOs will reduce the Institute's dependence on placements during the regular placement season. This year 300 PPOs were received, of which 194 have been accepted by the students. The hiring trend has been on the rise specifically for technical roles, with more companies giving PPOs through internships.

Department-wise internship offers

This year, students from all departments were in demand by firms and universities alike for internship positions. The demand for students from departments such as Computer Science was strong while that for Mechanical and Electrical Engineering students was high. Table 12 and Figure 6 show the department-wise distribution of internship offers made over the past 3 years.

Table 12: Department-wise internship offers over years

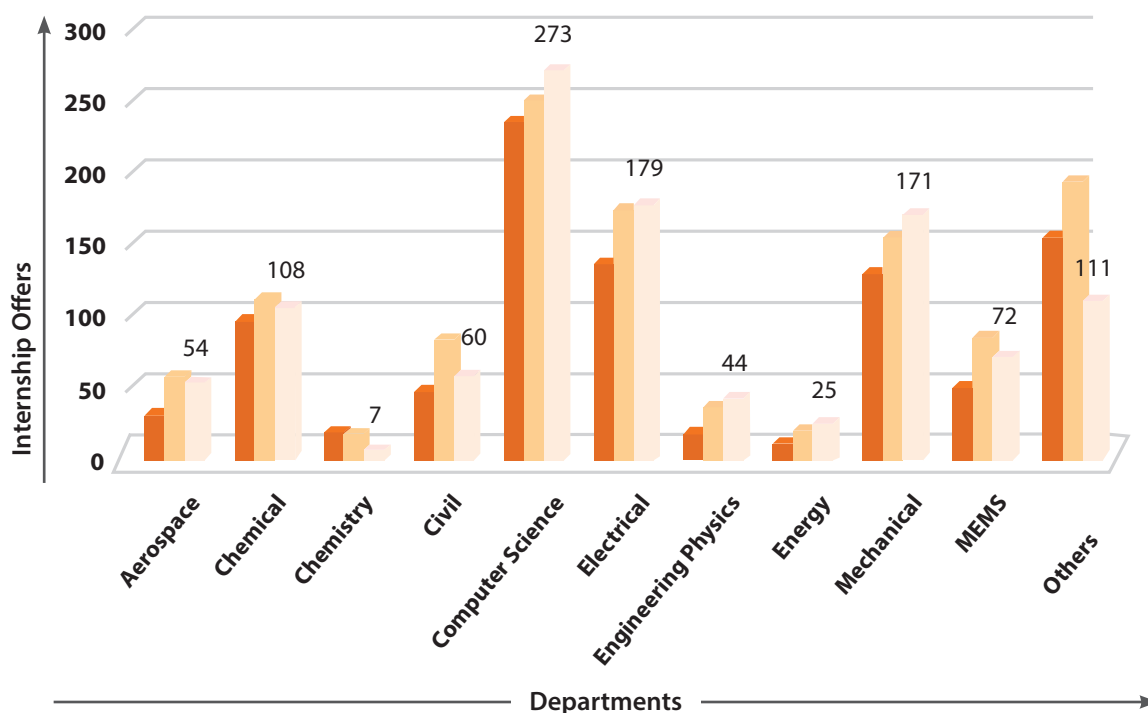| Department	2020–2021	2021 - 2022	2022 - 2023
Aerospace	33	58	54
Chemical	98	112	108
Chemistry	20	19	7
Civil	49	85	60
Computer Science	237	252	273
Electrical	138	176	179
Engineering Physics	19	38	44
Energy	11	20	25
Mechanical	130	155	171
MEMS	50	86	72
Others	155	194	111
Total	**940**	**1195**	**1104**

Figure 6: Department-wise classification of Internship offers

Summer vs. Winter Internship Offers

Summer internships usually begin in May and continue till mid-July, whereas winter internships are pursued in the month of December. The number of summer internship offers exceeds the number of winter internships, which is attributable mainly to the longer duration available in summer.

Table 13. Summer vs. winter internship offers

Number of internships	Summer internships	Winter internships
1104	963	141

Company vs. University internship offers

Companies of various business sectors offer internship positions to the students. This option presents an opportunity to gain industrial exposure and broaden one's skill-set in the domain of interest. A few years ago, the Institute started the credit-based internship program, by means of which the students could leverage the performance in their internship towards the academic credit requirement.

Table 14. Companies vs. Universities internship offers

Number of internships	Company offers	University offers
1104	1009	95

Conclusion:

The companies recruited in hybrid mode throughout the placement season in academic year 2022-23. The number of registered students in the 2022-23 placement drive has increased by 5.7 % in comparison with last year. IIT Bombay has achieved the highest ever number of students placed this year with total number of accepted offers being 1516 as on July 31, 2023 compared to total of 1441 for the previous placement season, 2021-22. This is a 5.2 % increase in total number of students placed indicating higher selections due to higher buoyancy in demand. The total recruited PhD students are 41 out of 131 active participants and have shown significant improvement over last year. Taking into account the total number of participating students, placement percentage is 82.16%. The overall average salary packages (based on CTC) showed a slight increase of 1.5 % over last year from Rs. 21.5 LPA to Rs. 21.82 LPA. Job scenario remains optimistic based on placement data over the last two years as the job generation has been robust after resumption of economic activity subsequent to the COVID–19 pandemic. The total number of companies offering jobs has increased from 325 companies last year to 384 this year. Overall, the upward trend of placements continued in season 2022-23, confirming that IIT Bombay is the preferred recruiting percentage is 88.77. The overall average salary packages based on CTC offered increased by 27.3% over last year from Rs. 17.91 LPA to Rs. 22.8 LPA. This may be attributed to resurgence of the job generation after resumption of economic activity. During internship recruitment session, total of 1087 students secured apprenticeship opportunities and there was a 15% increase in demand for students this year.

The total number of companies offering jobs saw an 11% increase from 292 last year to 325 companies participating this year. The placements were successfully completed in two phases, clearly demonstrating the demand of IIT Bombay graduates among the top recruiters in various segments of the economy. Placement team has achieved highest number of students getting placed with constant endeavor to create more employment opportunities.

SOCIETY FOR INNOVATION AND ENTREPRENEURSHIP

Society for Innovation and Entrepreneurship (SINE), the technology business incubator of IIT Bombay, is one of the oldest academic incubators in the country with a legacy of over 19 years. During this journey, SINE has nurtured many startups and also gained the leadership position in the business incubation community in India. A key highlight of the year is the Initial Public Offering (IPO) filing for Rs. 750 crores by SINE graduate company - ideaForge Technology Pvt. Ltd., co-founded in 2007 by IIT Bombay Alumni Ankit Mehta, Rahul Singh and Ashish Bhat.

SINE also hosts the Bionest incubator for supporting entrepreneurs and start-ups in life sciences and med-tech space. SINE was selected as NIDHI Centre of Excellence by the Department of Science and Technology, Government of India in the year 2017. The SINE NIDHI-CoE is expected to be functional by July- August 2023.

SINE, in its journey of 19 years, has created the following impact:

The 'Start-to-Scale' support of SINE includes preincubation support like - prototyping grants for early-stage innovators and startups, entrepreneur fellowships, bootcamps for innovators, incubation and seed support to tech-startups, for scale up – conducts accelerator programes in association with other corporates.

SINE continues to collaborate with government, corporates, institutions and international organisations for activities like: Joint accelerator and mentoring programmes, Product/ service/ idea validation of incubates and CSR initiatives.

SINE continues to act as **Program Management Unit (PMU)** for implementing NIDHI-PRAYAS programme nationwide and has successfully completed the implementation of four cycles. Fifth cycle of the programme is being implemented. Total 55 centres are implementing this programme, SINE continues to monitor and mentor these centres across the country.

During the DST Startup Utsav event, compendia of two programmes managed by SINE i.e., NIDHI-PRAYAS and CAWACH were published. It showcased the efforts of SINE in fostering entrepreneurship across the nation.

Impact

212	1000+	59	93	48	12
Startups Supported	Entrepreneurs Supported	Current Companies	Graduate Companies	Folded	Merged/ Acquired

SINE Invested **INR ~29.41 Cr.($3.92 mn)**		Funds Raised by startups **INR ~5527 Cr. ($736.91 mn)**	
SINE vs External Funding **1:188**		Valuation of startups **INR ~19230 Cr. ($2.56 bn)**	
IP's Generated **~200 (41 IITB IPs)**		Employment Generated **~5500**	
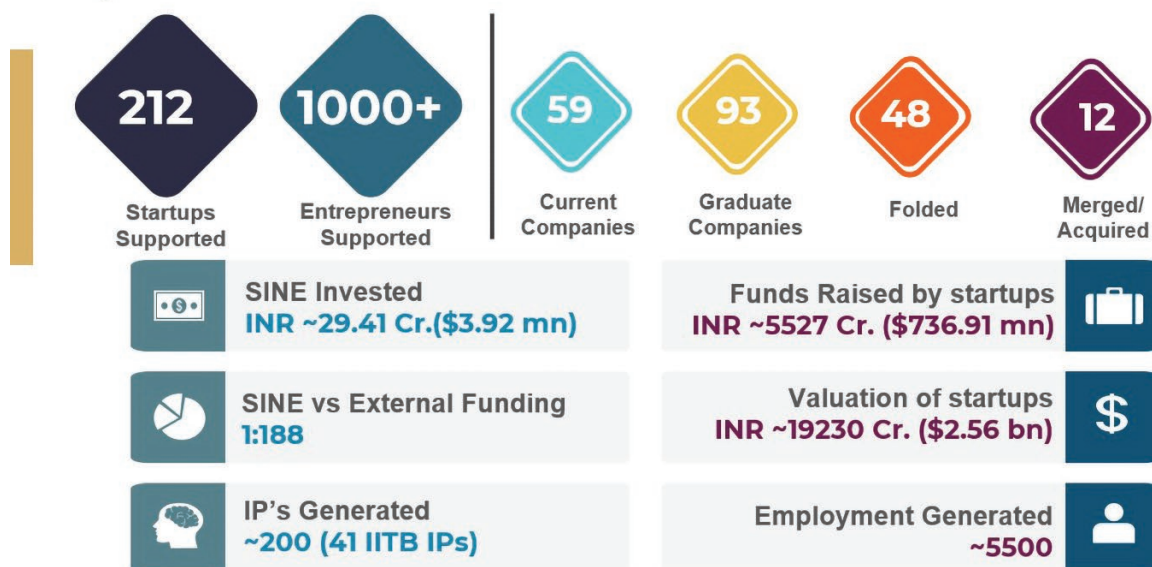
Pre incubation programs

SINE has been successfully implementing prototyping grants and fellowship programs of various government departments like the Department of Science and Technology (DST), Department of Biotechnology (DBT), Ministry of Electronics and Information Technology (MeiTY) etc. These prototyping and entrepreneurial fellowship grants support to aspiring or budding entrepreneurs in pursuing a promising technology business idea and helps convert their ideas into prototypes.

Prototyping grants - DST NIDHI-PRAYAS, MeitY TIDE 2.0, BIRAC BIG

SINE has implemented following prototyping grants and fellowship programs:

- **NIDHI-PRAYAS:** Successfully completed the implementation of three cycles. Under fourth cycle, total of 10 innovators/ start-ups were supported with total funding support of Rs. 1 Cr.

- **MeitY grant:** Completed the first cycle and second cycle is ongoing in which seven innovators have been supported with the total funding support of Rs. 42 lakhs

- SINE as a BIG partner is executing and monitoring Biotechnology Ignition Grant (BIG) grant from BIRAC across India. During the period 2022-23, two cycles (20th and 21st) of BIRAC's Biotechnology Ignition Grant (BIG) were completed and 14 participants were selected for the funding support.

Fellowship program – DST NIDHI-EIR and MeiTY TIDE 2.0

- **DST NIDHI EIR:** Successfully completed the implementation of three cycles under NIDHI-EIR programme. In the ongoing fourth cycle, total 10 entrepreneurs have been supported with the fund of Rs. 36 lakhs

- **MeiTY EIR:** Successfully completed first cycle. In the second cycle, six innovators were supported with the total funding support of Rs. 24 lakhs

Incubation:

SINE hosted 212 companies since inception, of which 17 are new companies that got incubated and ten companies have graduated in 2022-23. During the year, SINE has also supported 47 innovators and entrepreneurs under its various pre-incubation programs.

Plugin Alliance: SINE in collaboration with Intel has launched a first-of-its-kind industry technology alliance in India named 'Plugin Alliance' with YourStory as the media partner and Frost and Sullivan as knowledge partner, for Enterprise and MSME to accelerate and scale emerging technology solutions. Plugin Alliance provides an open collaborative framework for the ecosystem to nurture innovation and accelerate adoption of smart industry solutions. The Alliance has created an ecosystem of deep-tech startups with credible and validated solutions and also has a community of Enterprises and MSMEs who have access to solutions to industry 4.0 solutions.

The Plugin Alliance currently consists of:

- 115 members including more than 33 large enterprises, seven solution and scale members, 15 funding institutions and 15 ecosystem members and 45 deep-tech startups

- 265+ solutions have been listed by 45 member startups

- 30+ use cases shared by members for solution identification

Some of the notable Alliance members are Maruti Suzuki, TVS Motors, Honeywell, Bosch, Adani Power, Diageo, Deepak Group, Aditya Birla Group, ITC Group, RPG Group, Marico and many others across industries.

Powerthon 2022:

SINE continues to be the implementation partner for the programme Powerthon 2022 launched by the Ministry of Power (MOP), Government of India (GOI) as a part of their programme viz. "Revamped Distribution Sector Scheme - A reform-based and result-linked scheme". Under this challenge SINE monitors the progress of 17 TSPs shortlisted for pilot execution at Discom test-beds.

iDEX:

SINE as a partner incubator for iDEX by the Ministry of Defence has incubated around 32 start-ups. The programme focuses on defence technologies, on specific problem statments by defence, PSUs, DPSUs. Till date nine DISC cycles and four open challenge cycles have been executed.

SINE organised investors meet for the iDEX spark grantees and two investment deals were closed successfully.

SINE-START in Action

Partnerships and Collaborations

Partnerships are strengthening tools for startups and ecosystem. SINE continues to partner with multiple stakeholders to achieve an improvised upshot. SINE signed various MoUs to expand its partnerships during the year. In the year 2022-23, SINE signed MOU with multiple corporates such as Maruti Suzuki, Alkem, Mahindra and Mahindra, RPG Enterprises for supporting their open innovation programme. In addition to this Export Import Bank of India (EXIM) Bank, ICICI HFC, HDFC, DANA supported startups with seed funding and CSR. Total of 18 startups were selected for funding supports of Rs. 2.25 crores.

Funding and Acquisition:

Around 30 companies of SINE (current and graduate) has raised investment of Rs. 191.46 crores. Some of the key investors were IPV ventures, Thermex Ltd, Ankur capital, Keiretsu forum and other angel investors.

During the year SINE sanctioned the investment of around Rs. 10 crores to 25 startups via funding from various government organisations like DST, MeiTY, DBT/BIRAC and CSR funds from corporates.

▲ *SINE-START, Startup Training to Achieve Right Target (START) and 'Basics of Business' for early-stage innovators, aims to broaden participants' thinking from a technology-centric mindset to a venture-centric mindset of doing business. So far, four cohorts have been completed with a participation from around 90 startups*

Awards and Accolades:

1. Indian Women Institutional League (IWIL) acknowledged SINE as IWIL India Innovation and Incubator of the year award at Techversify 2022 summit held in New Delhi.

2. SINE startups were at the at DefConnect 2.0 function organized by iDEX-DIO at Vigyan Bhavan New Delhi by Hon'ble Defence Minister of India Mr. Rajnath Singh:

- Zeus Numerix won the iDEX DISC 5 Challenge for developing "Precision Guided Kit for 81mm Mortar Ammunition"

- Pacify Medical won IDEX Open Challenge OC3 for their wound care solution product for burn injuries

- **PupilMesh**, SINE incubatee obtained first place under the Dare 2 Dream Program for developing Armor Soldier Assist System.

3. **Haystack Analytics** was awarded Tech Startup of The Year (Big Data) at the 12th Annual Entrepreneur India Awards organised by Entrepreneur India. They also won the 13th edition of Aegis Graham Bell Award (AGBA) under the category - Innovative Diagnostics.

4. **Atomberg Technologies**, home appliance deep-tech company, got recognized as the winner of the Best Energy Efficient Appliance of the year in the Ceiling Fan Category at the National Energy Conservation Awards (NECA), 2022 ceremony at Vigyan Bhawan in New Delhi by Smt. Droupadi Murmu, the Hon'ble President of India.

Some pictures of products of SINE incubatees:

Greyeast Technologies Pvt Ltd

Forensic Cybertec Pvt. Ltd.

Bramhansh Technologies Pvt. Ltd.

Glimpses of events at SINE:

◀◀
Deputy Secretary of the US Department of Treasury - Wally Adeyemo during his visit to SINE, IIT Bombay

⬆ *Prof. Arindrajit Chowdhury, Department of Mechanical Engineering, IIT Bombay in a fireside chat with astronaut Sirisha Bandla*

⬆ *In partnership with Boeing, SINE executed the BUILD 2.0 Bootcamp at IIT Bombay for 10 early-stage startup teams*

⬗
Roundtable on Digital Transformation in Financial Services, in collaboration with IIM Lucknow – SIDBI Centre for Innovations in Financial Inclusion (SCIFI)

⬆ *Fintech Roundtable was conducted in association with Reserve Bank Innovation Hub (RBIH)*

IIT BOMBAY RESEARCH PARK FOUNDATION

IIT Bombay Research Park (IITBRP) Foundation fosters collaborations between industries and IIT Bombay ecosystem by bringing the innovative real-life problems of the industry to the highly sought-after intellectual capital of the Institute.

The period April 2022 to March 2023 filled Research Park with many exciting developments and activities.

Student Engagement:

The Research Park recognises the students as a core component of the Institute. Research Park actively partners in the Institute-level student events throughout the year. The list of such engagements with the students are listed below.

The Research Park and the Institute Tech Council (ITC) organised a Tech and R&D Expo, a two-day event during October 15-16, 2022. Milliken Chemical and Textile and igrenEnergi, the Research Park member companies, gave talks at this event.

EnPoWER, a student body in association with IIT Bombay Research Park, held ENTHUSE on October 28, 2022 to welcome the new batch of undergraduates with a promise of developing industrial ties. On February 4-5, 2023, Research Park sponsored the EnPoWER event, ResCon, which saw notable keynote speaker Dr. Rajagopala Chidambaram, former Principal Scientific Adviser to the Government of India.

IdeaForge, an IIT Bombay alum company and a member company of Research Park, hosted an Industry x Tech Hackathon challenge in collaboration with ITC. Over 50 students competed in this challenge.

The TechFest 2022 attracted significant participation from Research Park member companies; Ubisoft conducted a workshop and put up a gaming Kiosk and Atomberg, an IIT Bombay alum company, facilitated a corporate competition on home automation with an award of 1,75,000 Rupees during TechFest 2022. While NeoDocs, Emergy Enviro, igrenEnergi, Tejase Aerosense and Nanosniff Technology showcased their emerging technologies and products in the TechConnect stalls.

Research Park Member Companies Achievements

Research Park values the contribution of its member companies to society and recognises and celebrates their achievements. This year, there were many breakthrough achievements for our member companies and a few of the highlights were as follows:

- **NeoDocs** was declared the winner of three challenges, the Dell Startup Challenge '23, the India-Sweden Healthcare Innovation Challenge 2023 and the Wharton India Startup Challenge 2023.
- **Inventys** was the winner of the "Best Green Process" FICCI Chemicals and Petrochemicals Awards 2022 Category – Sustainability

Networking and Connecting

Conclave on Sustainability

IITBRPF organised a SIG (Specific Interest Group) on November 30, 2022. The event aimed to bring together industries, government bodies, think tanks, academia and policymakers. Illustrious chief guests invited were Dr. M. Ravichandran, Hon'ble Secretary, Ministry of Earth Sciences, Government of India, Dr.

Nitin Kareer, Additional Chief Secretary of the Revenue and Forest Department, Government of Maharashtra and Mr. Amar Nath, Additional Secretary Department of Administrative Reforms, Public Grievances and Pensions. Mr. Nadir Godrej, Chairman and Managing Director of Godrej Industries Ltd, delivered the plenary lecture. The event saw a large assembly of 194 participants. A team of faculty members evaluated the posters by IIT Bombay students showcasing the research work. Lastly, a panel discussion was conducted on 'Academia, Government, Industry, Community: Nexus for Sustainability.' The event highlighted the importance of taking active strides toward sustainable development.

Seminar on Joint Collaboration between Japanese Industry and IIT Bombay

The Research Park, in association with the New Energy Development Organisation (NEDO), a Japanese entity, held the event on February 24-25, 2023 to bring Japanese companies to foster collaboration with IIT Bombay. This event saw a congregation of representatives of over 24 Japanese, companies. The guests were offered tours of the state-of-the-art laboratories at IIT Bombay. The institute faculty members presented their research in emerging areas like green hydrogen, carbon capture, etc. Mr. Toshihiro Kaneko, the Chief Consulate-General of Japan in Mumbai, graced the second day of the conference. An IoT/Ai Hackathon was orgaised for the IIT Bombay students as part of this event. AWL, INC, a Research Park member company, facilitated the Hackathon. The award prize money offered to the top four winners was Rs. 2 lakhs. The highlights of this event were published in notable Japanese media channels.

New Research Park Building

The much-awaited Research Park building is close to completion. The building is expected to be operational before the end of 2023. The Park has been attracting new and promising clientele to work with the IIT Bombay ecosystem. This financial year alone, the Research Park has seen a twofold increase in companies joining as virtual members.

⬆ *Conclave on Sustainability*

INTERNATIONAL RELATIONS

IIT Bombay assigns significant value to its relationships with various international partners. Over the years, IIT Bombay has steadily built up a reputation for research and education both in India and abroad. This has helped in attracting bright and young researchers from all over the world, as faculty of the Institute.

The number of students enrolling for the Master's degree programme, with online instruction, were a bit higher than our usual intake. Few international students have also come to the Institute either as full-time or as exchange students. During the year, IIT Bombay has signed 47 MoUs with various foreign universities and met governmental and ministerial delegations from countries across the globe for exploring areas of collaboration and cooperation.

Memorandum of Understanding with Foreign Universities and Indian Univerisities signed through Dean IR office during April 2022 - March 2023:-

- The Instituto Politecnico Nacional of the United Mexican States, Mexico
- EdCIL (India) Limited, A CPSE Under MoE, implementing partner for study in India, Ministry of Education, Government of India
- Urgench Branch of Tashkent University of Information Technologies named after Muhammad Al-Khwarizmi, Uzbekistan
- Joint Multi-institutional International Education, Research and Training, University at Buffalo, The State University of New York; IIT Delhi, IIT Kanpur, IIT Bombay, IIT Jodhpur, IIT BHU, Ashoka Univeristy, Sonipat
- National Taiwan University, Taiwan
- Federal State Autonomous Educational Institution of Higher Education I.M. Sechenov First Moscow State Medical University of the Ministry of Health of the Russian Federation (Sechenov University), Russia
- Ecole de Technologie Superieure, Montreal, Canada
- Institut Teknologi Bandung, Indonesia
- Norwegian Geotechnical Institute (NGI), Norway
- Daffodil University, Bangladesh
- The Universidad Catolica Del Norte, Chile
- Faculty of Mechanical Engineering, University of Ljubljana, Slovenia
- University of Peradeniya, Sri Lanka
- Board of Regents of the University of Nebraska on behalf of the University of Nebraska-Lincoln, Nebraska, USA
- Kochi University of Technology, Japan
- KTH Royal Institute of Technology Stockholm, Sweden, Sweden
- University of Notre Dame Du Lac, USA
- Ecole Polytechnique Federale de Lausanne, Switzerland
- Technical University of Denmark, Denmark
- National Chung Hsing University, Taiwan
- Hiroshima University, Japan
- Technische Universitat Braunschweig, Germany
- Institut superieur de l aeronautique et de l espace, France
- The Abdus Salam International Centre for Theoretical Physics, Italy
- Czech Technical University in Prague, Czech Republic
- Technical University of Munich, Germany
- University of Alberta, Canada
- École nationale supérieure d'arts et métiers, France
- University of Alberta, Canada
- Hokkaido University, Japan
- National Research Tomsk State University, Russia
- Katholieke Universiteit Leuven, Belgium
- Freie University of Berlin, Germany
- Jeju National University, Republic of Korea, Korea
- Tarbiat Modares University, Iran
- Virginia Commonwealth University, USA
- The University of California, Berkeley, USA

- Kharazmi University, Iran
- Clermont Auvergne INP, Germany
- Beijing Foreign Studies University, China
- University of Texas, San Antonion, USA
- Institut Mines Telecom, France
- Jimma University, Ethiopia
- Astana IT University, Kazakhstan
- Persian Gulf University, Iran
- Shamoon College of Engineering, Israel
- University of Regensburg, Germany

Visits/ Meetings of International Delegations:

IIT Bombay also received a large number of international delegations for exploring areas of collaboration and cooperation. The major ones are as follows:

- **Moscow Polytechnic University, Russia:** Ms. Yulia Davydova, Vice- President for International Affairs and Mr. Pablo Emilio Bakero Iturralde, Head of Centre for Engineering and Development, Dean of Transport Faculty on April 7, 2022

- **Tel Aviv University, Israel:** Prof. Gary Sussman, Advisor on India, Prof. Milette Shamir, Vice President International Academic collaboration and Ms. Emma Aftermath, Director of Asia Engagement on April 8, 2022

- **Universitas Muhammadiyah Kudus, Indonesia:** Ms. Anny Rosiana Masithoh, Vice Rector for students and cooperation Affairs; Ms. Amalia Rahmawati, Director of International Office and Ms. Yunita Trimukti Soltani, International Cooperation Consultant on April 18, 2022

- **Technical University of Denmark, Denmark:** Prof. Philip John Binning, Senior Vice President, Dean of Graduate Studies and International Affairs and Ms. Louise Nolle, Senior International Relations Officer on April 21, 2022

- **Peter the Great St. Petersburg Polytechnic University (SPbPU), Russia:** Dr. Vladimir Khizhnyak, Head International Office on April 27, 2022

- **Universidade Federal do Rio de Janeiro (UFRJ), Brazil:** Prof. Claudio Pinheiro, Vice Chancellor of International Relations and Prof. Dr. Leticia Galluzzi, Coordinator of International Relations for the Baltic Sea and Scandinavian regions on April 27, 2022

- **Consulate General of Malaysia in Mumbai:** Mr. Zainal Azlan Mohd. Nadzir, Consul General; Mr. Roswaidin Mohd Zain, Director of Investment, MIDA; Mr. Vivek Kudtarkar, Investment Officer, MIDA; Ms. Risha Rajput, Marketing Officer, MATRADE and Mr. Purushottam Kamble, Administrative Assistant on May 9, 2022

- **KTH, Sweden:** Ms. Pia Schmitt, Project Support IRO; Mr. Jairam Vijayakumar Sujaya, International student recruitment and mobility, IRO and Prof. Shareq Mohd Nazir, Asst. Professor, School of Chemistry, Biotechnology on May 9, 2022

- **Embassy of Peru in India:** Mr. Fabio Subia Diaz, Head of the Cultural Section and Ms. Aaina Rehman, Administrative Assistant on May 30, 2022

- **The University of the West Indies Five Islands Campus Antigua and Barbuda:** Prof. Densil A. Williams, Pro Vice-Chancellor and Principal; Dr. Curtis Charles, Director of Academic Affairs; Ms. Stephanie N. Cain, Executive Assistant and Dr. K J Srinivasa, High Commissioner of India, Georgetown, on June 6, 2022

- **National Chung Hsing University, Taiwan:** Dr. Chia-Lin Chang, Vice President for International Affairs; Dr. Watson Kuo, Vice Dean, the office of R&D; Dr. Yeong-Kang Lai, Department Chair of Electrical Engineering and Ms. Rei, Office of International Affairs, Coordinator on June 8, 2022

- **Jimmy University, Ethiopia:** Mr. Efrem Wakjira, Scientific Director of Jimma Institute of Technology (JiT); Mr. Jemal Worku, Vice Scientific Director of JiT, Dr. Worku Jimma, Dean, Faculty of computing and Informatics and Dr. Faiz Akram, Assistant Professor, Faculty of Computing and Informatics, JiT on June 10, 2022

- **National Taiwan University, Taiwan:** Prof. Tzi-Dar Chiueh, Dean of Graduate School of Advanced Technology (GSAT) and Distinguished Professor, Dept. of Electrical Engineering and Ms. Chun I Wang, Coordinator of GSAT on June 27, 2022

- **Mergasor Technical Institute of Kurdistan, Iraq:** Dr. Talib Muhammadsharif Omer, Dean July 12, 2022

- **Virginia Commonwealth University, USA:** July 2022 - Prof. Michael Rao, President on July 14, 2022

- **Nanyang Technical University, Singapore:** Prof. Lam Khin Yong, Senior Vice President (Research); Prof. Tim White, Vice President, Office of International Engagement and President's Chair in Materials Science and Engineering; Prof. B.V.R. Chowdari, Senior Executive Director, India Strategy International Engagement; Prof. Shane Snyder, Executive Director, NEWRI; Prof. Adil Dhalla, Managing Director, START Centre; Dr. Chava Vijaya Saradhi, Deputy Director, Technology Development, NTU Innovation Centre and Ms. Preeti Dawra; Director, Global Marketing, Office of International Engagement on July 15, 2022

- **Consulate General of The Republic of Indonesia in Delhi:** Mr. Eko Junor, Consul for Socio-Culture and Prof. Aldrin Herwany, Attache of Education on July 18, 2022

- **University of Miami, USA:** Dr. Pratim Biswas, Dean, College of Engineering, Professor Chemical, Environmental and Materials Engineering and affiliated with Rosenstiel School of Marine and Atmospheric Sciences on July 19, 2022

- **Consulate General of Denmark in Bangalore:** Dr. Søren Tranberg Hansen, Counsellor for Science and Research on August 1, 2022

- **U.S. Consulate General in Mumbai:** Mr. Harold Brayman, Commercial Officer and Ms. Noella Monteiro, U.S. Commercial Service on August 2, 2022

- **University of Alberta, Canada:** Prof. Cen Huang, Vice Provost and Associate Vice President International; Dr. Catherine Swindlehurst, Chief Strategy Officer; Dr. Amit Kumar, Professor of Mechanical Engineering and President of Engage India: Association of Professors and Ms. Maria Mathai, Advisor India on August 18, 2022

- **Bar-Ilan University, Israel:** Prof. Moshe Lewenstein, Vice president for Internationalism; Prof. Rachel Dekel, Academic Head of the International School; Mr. Ofer Dahan, Executive Director of the International School and Ms. Radhika Haldankar, Country Coordinator India on August 22, 2022

- **Embassy of Grand Duchy of Luxembourg in Delhi**: H.E. Mrs. Peggy Frantzen, Ambassador of Luxembourg to India; Mr. Perses Bilimoria, Honorary Consul of Luxembourg in Mumbai and Mr. Abhishek Wadehra, Business Developer on September 1, 2022

- **Consulate General of France in Mumbai:** Mr. Jean-Marc Séré- Charlet, Consul General; Dr. Olivier Fudym, Attache for Scientific and Academic Cooperation and Ms. Amruta Datar, Deputy to Attache of Academic and Scientific Cooperation West India on September 19, 2022

- **Technical University of Munich, Germany:** Prof. Juliane Winkelmann, Senior Vice President International Alliances and Alumni and Ms. Mohaa Vyas, Senior Regional Manager, India on September 23, 2022

- **Technische Universität Braunschweig, Germany:** Prof. Dr. Angela Ittel, President; Prof. Dr. Tatjana Schneider, Vice President for International Affairs; Dr. Eika Auschner, International House and Prof. Dr. Sándor Fekete, Chair, Algorithms Division, Department of Computer Science on October 10, 2022

- **Russian Centre for Science and Culture in Mumbai:** Dr. Elena Remizova, Vice-Consul of the Russian Consulate and Director and Mr. T V Rajeev, Administrator on October 18, 2022

- **MIT Sloan School of Management, USA:** Dr. Urmi Samadar, Assistant Dean on October 27, 2022

- **Consulate General of the Federal Republic of Germany:** Consul General Achim Fabig and Deborah von Frankenberg und Ludwigsdorff, Cultural Officer on November 3, 2022

- **Imperial College of London, UK:** Prof. Maggie Dallman, Vice President International and Associate Provost Academic Partnerships; Mr. Alex Page, Senior International Relations Officer for Asia and Ms. Rosanna Gillespie International Relations Officer, South Asia on November 3, 2022

- **Jeju National University, South Korea:** Prof. Cho Moon Jae, Dean of International Affairs; Prof. Jenie Hahn, Office of International Affairs and Ms. Miji Oh, Office of International Affairs on November 4, 2022

- **Loughborough University, UK:** Prof. Nick Jennings, Vice- Chancellor and President of Loughborough University; Prof. Martyn Edwards, Director of Marketing and Advancement; Prof Bala Vaidhyanathan, University Special Envoy India, Department of Materials, School of Aeronautical, Automotive, Chemical and Materials Engineering; Ms. Tanika Dhiri, Graduate Management Trainee and Dr Kirti Ruikar – University Special Envoy India, School of Architecture Building and Civil Engineering on November 7, 2022

- **University of Bristol, UK:** Prof. Ian Bond, Dean of the Faculty of Engineering; Prof. Charl Faul, Faculty International Director of the Faculty of Science; Ms Lorna Cuckow, Deputy Director International and Head of International Partnerships and Relations and Mr. Devesh Anand, Country Manager, India on November 14, 2022

- **Riga Technical University, Latvia:** Prof. Igors Tipans, Deputy Rector of International Cooperation and Studies and Ms. Zane Purlaura, Deputy Director of International Cooperation and Foreign Students Department on November 14, 2022

- **Universidade Federal do Rio de Janeiro (UFRJ), Brazil:** Prof. Jose' Orlando Gomes President-International Ergonomics Association (IEA), UFRJ's Coordinator for International Affairs to BRICS Countries on November 22, 2022

- **Institute of Science and Technology Austria:** Prof. Thomas A. Henzinger, President; Prof. Michael Sixt, Executive Vice President and Dr. Georg Schneider, Managing Director on November 23, 2022

- **Office of Jon Ossoff, US Senator for Georgia:** Balaji Narain, General Counsel on November 30, 2022

- **University of Illinois Urbana-Champaign:** Prof. Joseph Walsh, Interim Vice President for Economic Development and Innovation on December 5, 2022

- **Coventry University, Singapore Hub:** Mr. Jovie Pebrihandono, Regional Business Development Executive on December 12, 2022

- **Swinburne Vietnam:** Ms. Ha Do Thanh Thu, Coordinator of the Global Engagement Center on December 22, 2022

- **Moscow Institute of Physics and Technology, Russia:** Prof. Dmitry Burovenko, Head of the International Department and Prof. Irina Obukhova, Leading specialist on international relations and projects on December 23, 2022

- **Finnish delegation** (including Embassy Personals, Business and Company Personals) led by the Minister of Employment of Finland on 16th December 2022

- **Monash University, Malaysia:** Dr. Arshad Salema, Senior Lecturer and Course Director for Master of Applied Engineering, School of Engineering on January 12, 2023

- **University of Alberta, Canada:** Prof. Bill Flanagan, President and Vice-Chancellor; Dr. Cen Huang, Vice-Provost and Associate Vice-President (International); Dr. André McDonald, Associate Vice-President (Strategic Research Initiatives and Performance), Office of the Vice-President (Research and Innovation); Dr. Amit Kumar, Deputy Director, Future Energy Systems; President, Engage India: Association of Professors; Professor, Faculty of

Engineering and Dr. John Bell, International Research Officer, Office of the Vice-President (Research and Innovation) on January 13, 2023

- **Consulate General of Japan in Mumbai:** Dr. Fukahori Yasukata, Consul General and Mr. Noritaka Tauchi, Consul, Culture and Information visited IIT Bombay on January 18, 2023

- **University of California, Berkeley, USA:** Mr. Chris Bush, Executive Director, Institute for Business Innovation; Mr. Ganesh Iyer, Edgar F. Kaiser Professor, Haas School of Business and Faculty Director, Center for Growth Markets; Ms. Adriana Macias, Assistant Director, Garwood Center for Corporate Innovation and Mr. Tristan Gaspi, Assistant Director, Institute for Business Innovation on January 19, 2023

- **Astana IT University, Kazakhstan (Online):** Mrs. Leila Salykova, Director of the International Cooperation Department; Mr. Dauren Zhakebayev, Dean; Mr. Olzhas Turar, Director of the Department of Computer Technology and Data; Ms. Diana Toimbek, Director of the School Creative Industries; Mr. Baurzhan Ilyassov, Director of the Department of Intelligent Systems and Cybersecurity; Ms. Bibinur Meirbekova, Deputy Director of the Computer Engineering Department and Mr. Aivar Sakhipov, Senior-lecturer of the Computer Engineering Department on January 20, 2023

- **Aston University, UK:** Prof. Kate Sugden who is the Deputy Dean of the College of Engineering and Physical Sciences on January 23, 2023

- **The University of Texas at San Antonio, USA (Online):** Dr. Ambika Mathur, Vice Provost of Graduate Studies and Dean of The Graduate School on January 24, 2023

- **Oregon State University, USA:** Prof. Jayathi Murthy, President; Mr. Bob Gilmour, Executive Director of INTO Oregon State University and Mr. Davinder Kumar, Vice President of Corporate and Public Relations of INTO University Partnerships, a partner of Oregon State University on January 27, 2023

- **Tunghai University, Taiwan (Online):** Dr. James Sims, Dean of the International College and Dr. Huang, the Dean of Science College on January 30, 2023

- **University of Toronto, Canada:** Prof. Meric Gertler, President; Prof. Joe Wong, Vice-President, International; Ms. Gwen Burrows, Assistant Vice-President, International Engagement and Impact and Ms. Vanessa Laufer, Director, International Relations on January 31, 2023

⮝ *University of Toronto, Canada at IIT Bombay*

- **Delft University of Technology, Netherlands (Online):** Prof. Jenny Dankelman, University Ambassador India and Ms. Marie Kummerlowe, Coordinator External Relations Brazil and India on February 1, 2023

- **University of South California, USA (Online):** Prof. Gaurav S. Sukhatme, Executive Vice Dean, Viterbi School of Engineering and Professor of Computer Science and Electrical and Computer Engineering and Ms. Kelly Goulis, Senior Associate Dean for Admission and Student Engagement on February 2, 2023

- **University of Sheffield, UK (Online):** Dr. Malcolm Butler, Vice-President and Director of Global Engagement; Dr. Billy Mitchell - Head of Partnerships and Global Opportunities and Ms. Claire Hunter,

International Partnerships and Global Opportunities Manager on February 8, 2023

- **University of Victoria, Canada:** Dr. A R Elangovan, Associate Vice-President, Global Engagement on February 10, 2023

- **Sweden-India Smart City Delegation:** A 12-member delegation including delegates from Swedish universities, research institutes and agencies accompanied by their Consulate in India visited IIT Bombay to interact with CUSE, IIT Bombay on February 16, 2023

- **University of York, UK:** Prof. Charlie Jeffery, Vice-Chancellor and President; Prof. Miles Elsden, Director Institute for Safe Autonomy; Mr. Rohit Kumar, Director, International Recruitment, Partnerships and Mobility and Mr. Amarjit Singh, Chief Executive Officer, India Business Group, London on February 17, 2023

- **Sri Lanka Consulate General in Mumbai:** Dr. Valsan Vethody, Consul General and Mr. Sandun Sameera, Consul (Commercial), Ms. Akanksha Shah, Executive Assistant on February 21, 2023

- **Consulate General of Israel in Mumbai:** Ms. Dahlia Neumann, Deputy Consul General on February 24, 2023

- **University of Buffalo, USA (Online):** Prof. Nojin Kwak, Vice Provost for International Education and Prof. John Wood, Senior Associate Vice Provost for International Education on March 1, 2023

- **Ufa State Petroleum Technological University, Russia (Online):** Mr. Nail Chanyshev, Vice-Rector for International Affairs; Ms. Ekaterina Kotova, Head of International Relations Department and staff from the International Office on March 2, 2023

- **Gachon University, South Korea (Online):** Prof. Kyoungjin Choi, Dean of International Affairs on March 3, 2023

- **Military Technical College, Oman:** Dr. Mohamed Al Siyabi, Dean accompanied by the administration team on March 6, 2023

- **East Kazakhstan Technical University, Kazakhstan (Online):** Dr. Tair Mukhamadiyev, Head of International Department; Ms. Kalamkas Daniyarova, Project Manager and Mr. Sanjay Vedi, Director, Swami Vivekananda Cultural Centre, Embassy of India, Astana, Kazakhstan on March 9, 2023

- **United States-India Educational Foundation-Fulbright Commission in India:** 14 senior U.S. university officials on March 13, 2023

- **Max-Planck-Gesellschaft (MPG), Germany:** Prof. Klaus Blaum, Vice-President and Nuclear Physics, Director; Prof. Paul Rainey, Evolutionary Biology, Director; Dr. Arunima Ray, Mathematics, Research Group Leader; Christiane Haupt, MPG; Marion Cerri, MPG; Renate Bischof-Drewitz, MPG and Ms. Poonam Sehgal Suri, Representative of MPG India Office on March 15, 2023

- **University of Waterloo, Canada:** Dr. Sushanta Mitra, Professor Mechanical Engg. and Prof. Ian Rowlands, Associate Vice President International on March 23, 2023

- **Northeastern University, USA** - 24th March 2023 - Ms. Meisha Swaby, Director of Faculty-Led Programmes on March 24, 2023

- **Consulate General of the Republic of Türkiye in Mumbai:** Mr. Cüneyt Yavuzcan, Consul General on March 27, 2023

- **University of California, Santa Cruz:** Prof. Alex Wolf, Dean of the Baskin School of Engineering and Prof. Michelle Whittingham, Associate Vice Chancellor of Enrollment Management on March 28, 2023

- **University of Tsukuba, Japan:** Prof. Dr. Osamu Ohneda, Executive Officer for International Strategy; Prof. Sakurai Takeaki, Pure and Applied Sciences and Dr. Mizuho Fukushige, Assistant Professor, Faculty of Medicine on March 30, 2023

The following international visits were taken to enhance international networking:

Visit to Malaysia:

Prof. Amit Agrawal, Dean (International Relations) and Prof. Avinash Mahajan, Dean (Academic Programmes) visited Malaysia in

February 2023 to participate in the University Administration Meeting 2023 of Asian Universities Alliance (AUA), a consortium that IIT Bombay is a member of. This meeting was hosted by the University of Malaya, Malaysia, a member university of AUA and held during February 14-15, 2023. The purpose of this meeting is to encourage member universities of AUA to enhance communications on the best practices for university administration. This meeting aimed to promote joint/ dual postgraduate academic programmes among the participating institutions, followed by establishing a general framework of collaboration and a timeline to launch the programme for the potential joint/ dual postgraduate academic programmes.

⬆ *Prof. Amit Agrawal, Dean IR, IIT Bombay and Prof. Avinash Mahajan, Dean AP, IIT Bombay at University Administration Meeting 2023 of Asian Universities Alliance (AUA) hosted by University of Malaya, Malaysia*

Prof. Agrawal and Prof. Mahajan visited the University of Technology Malaysia on February 12, 2023 to discuss ways we can enhance our partnership. Also, they visited Universiti Kebangsaan Malaysia on February 13, 2023 and Monash University Malaysia on February 15, 2023 to explore collaboration opportunities.

Visit to Japan:

Prof. Amit Agrawal, Dean (International Relations) visited Japan in March 2023 to participate in U7+ Presidential Summit 2023 held during March 16-17, 2023. Prof. Subhasis Chaudhuri, Director participated online in this Summit. IIT Bombay is a member of U7+ and this summit was hosted by Keio University, Japan - also a member university of U7+. Besides reviewing U7+ achievements, this summit

focused on the role of universities in securing peaceful and sustainable democracies.

⬆ *Prof. Subhasis Chaudhuri, Director (Online) and Prof. Amit Agrawal, Dean IR at U7+ Presidential Summit 2023 hosted by Keio University, Japan*

Prof. Agrawal visited the Tokyo Institute of Technology, Japan on March 15, 2023 to explore collaboration opportunities. He also visited Hiroshima University, Japan on March 20, 2023 to discuss ways to enhance partnership.

Asian Universities Alliance (AUA)

The Asian Universities Alliance (AUA) is a consortium of Asian universities. It is a regional organization established with an objective to jointly address regional and global challenges, specifically related to higher education, economic, scientific and technological development by strengthening collaboration among member institutions. AUA was established by a core of 15 universities, with IIT Bombay being a founding university of AUA.

Following activities were organised under AUA consortium:

Asian University Alliance :

The Asian Universities Alliance (AUA) is a university alliance comprising 15 member universities across Asia. Founded in 2017, through its platform AUA aims to cooperatively address regional and global challenges relating to higher education as well as economic, scientific and technological development. Each year, AUA holds a variety of programmes that promote student mobility, research collaboration and the sharing of university strategies and policies among its member universities.

AUA Overseas Study Programme 2022 on Freight Transportation in Planning and Logistics (FTPL):

Under the consortia Asian Universities Alliance (AUA), IIT Bombay Office of International Relations and the Department of Civil Engineering (CE) hosted a short-term programme in online mode from July 4-15, 2022 on FTPL for the students of AUA member universities and students of non-AUA international partner universities. Prof. Gopal Patil from (CE) conducted this programme. The efficient movement of goods is critical for economic development, safety, congestion, environment and this programme covered various key topics in freight transportation planning and logistics operations. In total 27 students from AUA and non-AUA member universities participated in this programme.

AUA Executives Meeting 2022:

During November 9-10, 2022, the sixth AUA Executives Meeting was hosted by AUA Executive Presidency 2022-23 United Arab Emirates University (UAEU). All attendees shared their experiences of AUA programmes and discussed opportunities for future development. AUA member universities should continue to create new avenues for cooperation and forge collaborations on research in new arenas to strengthen ties among AUA member universities through innovative approaches. From IIT Bombay, Prof. KVK Rao, Deputy Director Finance and External Affairs, Prof. Amit Agrawal, Dean (International Relations) and Ms. Tanvi Mehta, Executive Officer, Office of International Relations participated.

AUA Education Fair:

This is the second year that all AUA member universities hosted a joint education fair. This fair was held on the October 8-9, 2022 for students seeking post-graduation career opportunities. The highlight of the fair was a series of more than 30 live recruitment events delivered by provosts and admissions officers of the 15 universities, who introduced the latest admissions policy for international students, the application process and the featured academic programmes. Prof. Amit Agrawal, Dean (International Relations) shared information on various post-graduation

options available at IIT Bombay for international students.

AUA Lecture Series:

The Office of International Relations in coordination with the Centre for Technology Alternatives for Rural Areas (CTARA) participated in the Lecture Series hosted by the AUA. The AUA Lecture Series was held in online mode and was themed on "Future of Energy". The aim of this lecture series was to invite experts from AUA member universities to introduce the energy strategies of their home countries, including scenario planning and guide participants to rethink how to ensure access to affordable, reliable, sustainable and modern energy for all. The lecture series was scheduled from October 2022 to December 2022, with two lectures per week. Each member university was invited to organize a lecture conducted by the faculty member of their university and Prof. Anand B. Rao, Head, CTARA gave a lecture on "Energy Sustainability and Climate Goals" in this series from IIT Bombay on November 17, 2022. Also, three students from the Department of Energy Science and Engineering were nominated to participate in this series and attended the lectures conducted during this Lecture Series.

AUA Academic Conference:

The Water Innovation Centre: Technology, Research and Education, Department of Metallurgical and Materials Science, IIT Bombay organized the 2nd International Conference on Water Technologies during December 1-2, 2022 at IIT Bombay in hybrid mode in association with AUA. The conference showcases six plenary sessions and 15 invited talks. There were about 120 contributory talks and about 36 posters in three parallel sessions. A total of around 200 participants from all parts of the country and more than 10 countries globally made this a successful event.

Heritage Network:

Heritage Network is an Indo-European network of leading technical higher education institutions involved in joint collaboration through their research and academic activities that address common priorities of national interest and the

well-being of society. The General Assembly of Heritage Network was held during October 21-22, 2022 at IIT Madras, Prof. Amit Agrawal, Dean (International Relations) participated. In this meeting, there were discussions among universities to increase internationalization by encouraging student mobility, promoting dual degree programmes and maintaining and sharing a database of expertise of Indian and European member universities to encourage collaborations.

U7+ was featured during an official side event at the "UNFCCC's COP27 climate summit in Sharm El-Sheikh, Egypt on November 17, 2022. During the event titled "Universities as key solutions providers: leveraging our local and global networks for innovation", U7+ talked about global university networks. IIT Bombay contributed to the side event of U7+ at COP27. Two intensive case studies showcasing the contribution of big team of expert faculty and bright PhD scholar of IIT Bombay was provided to U7+. Prof. Anand B. Rao (Climate studies and CTARA), Prof. Subimal Ghosh, (Convener, Interdisciplinary Programme in Climate Studies) and Prof. K. Narayanan, head of Department of Economic are few among the several contributors in the mentioned case studies.

Presidents' Forum of Southest and South Asia and Taiwan Universities (SATU Presidents' Forum):

The objective of this forum is to strengthen academic cooperation among Taiwan and Southeast and South Asian countries. This forum provides a venue for academics to share their valuable experiences to improve higher education and international cooperation in the region. The Forum's General Assembly (GA) and Steering Committee Meeting was held during November 23-24, 2022 in Tainan, Taiwan. The GA served as a platform for members to exchange the newest ideas and experiences.

The theme this year was "Sustainable Alliances: Solutions for Strategic Partnerships in Light of Challenges and Uncertainties". There were different sessions where member institutions shared their valuable insights in exploring different aspects of forming alliances to build a sustainable future. From IIT Bombay, Prof. Amit Agrawal, Dean (International Relations)

and Prof. Rajesh Zele, Department of Electrical Engineering participated.

ASEAN Awareness Day:

On the occasion of the 55 Association of Southeast Asian Nations (ASEAN) Day celebration, the Office of International Relations successfully organized its first offline post-pandemic pandemic on the August 8, 2022 at IIT Bombay. For the event Consul Generals of Indonesia, Malaysia and Thailand addressed the faculty and students of IIT Bombay. During the session, the Consul Generals gave insights about ASEAN Day, the ASEAN agenda 2025, India–ASEAN collaborations and IIT Bombay-ASEAN universitie's association. An interactive question-answer session where the Consul Generals addressed the queries of the audience was the highlight of the event. The session was beneficial for IITians as they gained clarity for future career opportunities in ASEAN countries and discussed future initiatives for the betterment the of ASEAN-IIT Bombay collaborations.

IIT Bombay participation in IR Conclave:

IIT Gandhinagar hosted the 4th all IIT's International Relations (IR) Conclave on September 30, 2022 and October 1, 2022. The conclave included discussions regarding international admission strategies, international student exchanges and enhancing experience of international students during their stay at IIT. During this conclave, Prof. Agrawal shared the evolving admission strategies practiced at IIT Bombay to increase international students on campus.

Inbound Students:

During the autumn semester 2022, IIT Bombay had 15 undergraduate and graduate students from foreign Universities/ Institutes for a semester exchange along with 12 international students for project work. These students are majorly from European and Asian countries. Also, 24 students have joined the full-time Post graduation and PhD programmes and an orientation programme was arranged for them on August 19, 2022. This orientation programme introduces them to IIT Bombay functioning, rules and regulations. Currently, there are 77 international students doing their post-graduation and PhD

programmes from 16 different countries at IIT Bombay. A dinner was hosted by the Office of International Relations on September 23, 2022 for the International students.

Outbound Students:

The international semester exchange programmes provide broad-based benefits to students where they get the opportunity to seek international exposure and acquaint themselves with new cultures and global educational standards. Such activities are an important part of the overall development of a student giving them awareness and help adopt alternative, multi-faceted approaches to learning. With changing global economic conditions, international exchange programmes are becoming viable and effective prospects of learning and gaining international exposure.

IIT Bombay supports outbound exchange programme for their students in order to add an international perspective to their education. There were 20 students from IIT Bombay who went on for semester-exchange to foreign universities like ETH Zurich, Aalto University, Technical University of Denmark, Ecole Polytechnique Federale de Lausanne, Korea Advanced Institute of Science and Technology, University of Geneva, Monash University, Sciences Po, Universite de Strasbourg, Loughborough University, Politecnico di Milano and University of Bologna. These exchange programmes provide students with an experience of a different education system and practices that can be of great advantage. It also enhances future employability and academic success, allowing them to build up a network of valuable contacts, broaden their horizons and develop an entire range of new soft skills.

Under a project promoted by the Ministry of Education, Culture, Sports, Science and Technology, Japan (MEXT), for short-term research experience, three students from IIT Bombay visited Hokkaido University (under International Research Skills Programme for Developing Sustainable Transportation System and Infrastructure (STSI)). This programme is jointly conducted by Hokkaido University, IIT Bombay, IIT Hyderabad and IIT Madras.

Winter Schools:

The Office of International Relations successfully completed the Winter School Programme in December, 2022. The virtual programme offered four interesting courses on pressing topics namely: a) Durability and Sustainability of Construction Materials (by Prof. Swathy Manohar - Dept. of Civil Engg.), b) Science and Technology of CCUS and Hydrogen: Carbon Management and Sustainable Energy (by Prof. Vikram Vishal – Dept. of Earth Sciences and Prof. Arnab Dutta – Dept. of Chemistry), c) Understanding Artificial Intelligence, Ethics and Policymaking in the context of Education: An interdisciplinary perspective (by Prof. Syaamantak Das, IDP in Educational Technology)and d) Systems Biology: A quantitative way of understanding biological regulations (by Prof. Sandip Kar – Dept. of Chemistry). Despite the vacation and exam season, noteworthy registrations from around the globe for the programme were recorded. A total count of 180 applications was received from different countries across the globe such as Brazil, Bhutan, Bulgaria, China, Denmark, Germany, Guyana, Indonesia, Iran, Japan, Malaysia, Netherlands, Nigeria, Turkey and Uzbekistan. Further rigorous screening of applications by the faculty members raised the standards of the programme.

The advantages offered by the programme to the participants were not limited to the study material distribution and developing an understanding of the courses but extended to one on one interactive and exciting sessions with expert IIT Bombay professors. Additionally, the programme instructors conducted short projects and quizzes/exams for final evaluation thus making the lecture sessions more competitive and beneficial for the participants. IIT Bombay professors were acknowledged for being a part of this programme and conveying highly informative lecture sessions. Encouraging and appreciating feedback was received from the participants and they are looking forward to attending such programmes organized by IIT Bombay in the future. Overall such programmes present promising opportunities for sharing knowledge and ideas with the global student community. The Office of Dean (IR) continues to improvise the programme based on previous faculty and

student feedback and will continue to offer Summer and Winter courses for the benefit of the students and bringing additional visibility to the Institute. The Office of Dean (International Relations) is looking forward to offering exciting courses in the next Summer school programme, 2023.

IIT Bombay Students participated in Student Exchange Programmes (under the Memorandum of Understanding) during Academic Year 2022-23:

Sr. No	Name of the University	No. of students/ Programmes
1	Aalto University, Finland	One dual degree student from Department of Electrical Engineering and one MTech student from C-MInDS
2	Bogazici University, Turkey	One dual degree student from Department of Energy Science and Engineering
3	Ecole Nationale Supérieure des Arts Décoratifs, France	Two MDes students from IDC School of Design
4	EPFL Lausanne, Switzerland	Two dual degree students from Department of Electrical Engineering, one dual degree student from Department of Energy Science and Engineering, one BTech student from Department of Computer Science and Engineering
5	ETH Zurich, Switzerland	One BTech student from Physics, one dual degree student from Department of Electrical Engineering, one dual degree student from Environmental Science and Engineering Department, one BTech student from Department of Computer Science and Engineering
6	Korea Advanced Institute of Science and Technology, Korea	One dual degree from Department of Mechanical Engineering, one dual degree student from Department of Energy Science and Engineering, one MDes student from IDC School of Designs
7	Koc University, Turkey	One BTech student from Department of Mechanical Engineering
8	Katholieke Universiteit Leuven, Belgium	Three MBA students from Shailesh J. Mehta School of Management
9	KTH Royal Institute of Technology, Sweden	One dual degree student from Department of Mechanical Engineering, one dual degree from Department of Electrical Engineering, one BTech student from Department of Computer Science and Engineering
10	Loughborough University, UK	Two students of Department of Economics Bachelor of Science Degree student from Department of Humanities and Social Sciences
11	Lehigh University, USA	One BTech student from Department of Civil Engineering

Sr. No	Name of the University	No. of students/ Programmes
12	Monash University, Australia	One BTech student from Department of Electrical Engineering, one dual degree student from Department of Electrical Engineering, one MDes student from IDC School of Designs and one BTech student from Department of Aerospace Engineering
13	National University of Singapore, Singapore	One Bachelor of Science student from Department of Humanities and Social Sciences, one BTech student from Department of Computer Science and Engineering
14	Politecnico Di Milano, Italy	One BTech student from Department of Physics, one dual degree student from Department of Energy Science and Engineering
15	Sciences Po, France	Two dual degree students from Department of Energy Science and Engineering
16	Technical University of Denmark, Denmark	Two dual degree students from Department of Electrical Engineering, one BTech student from Department of Computer Science and Engineering and one dual degree student from Environmental Science and Engineering Department
17	University of Bologna, Italy	One dual degree student from Department of Metallurgical Engineering and Material Sciences, one Bachelor of Science student from Department of Humanities and Social Sciences, one dual degree student from Department of Electrical Engineering, one MDes student from IDC School of Designs
18	University of Geneva, Switzerland	One dual degree student from Department of Energy Science and Engineering, one dual degree student from Department of Electrical Engineering, one Bachelor of Science student from Department of Humanities and Social Sciences, one dual degree student from Environmental Science and Engineering Department
19	University of Strasbourg, France	Two dual degree students from Department of Energy Science and Engineering

Foreign Language courses:

Following language courses for the students and staff of IIT Bombay were organised in the Autumn and Spring semester:

- Japanese (in association with Koo International Co. Ltd., Japan)
- French language courses
- Mandarin language courses

The courses were conducted by the native speakers of these languages.

International Students:

A total of 65 International students (from countries like Afghanistan, Bangladesh, Brazil, Canada, Denmark, Finland, France, Germany, Guyana, Hong Kong, Indonesia, Italy, Ivory Coast, Japan, Myanmar, Nepal, Spain, Switzerland, The Netherlands, USA and Vietnam) have registered at IIT Bombay during the financial year 2022-23. They have joined IIT Bombay for course work/ project work/ post graduate studies.

ALUMNI AND CORPORATE RELATIONS

In the year 2022-23, the Institute continued its pathbreaking mission of nurturing world-class education and research ecosystems. IIT Bombay received tremendous support from its alumni, corporates and well-wishers across the world. Alumni participation included strategic advice, participation in activities such as guest lectures, alumination, student mentoring, being part of department advisory boards and financial and technical support towards the Institute's priorities in scientific research, student financial aid, faculty development, infrastructure and more.

IIT Bombay seeks to develop its infrastructure capabilities, support faculty and students through chair professorships and scholarships and establish research facilities in emerging technologies such as climate change, drug discovery, circular economy, nanotechnology, sensors, e-mobility, translational research and many more.

In the financial year 2022-23, Dean (ACR) office raised approximately Rs. 180 crores, a 58% increase in fund collected compared to the previous year's collection of 114 crores.

Funds raised in FY 22-23 (in Crores)
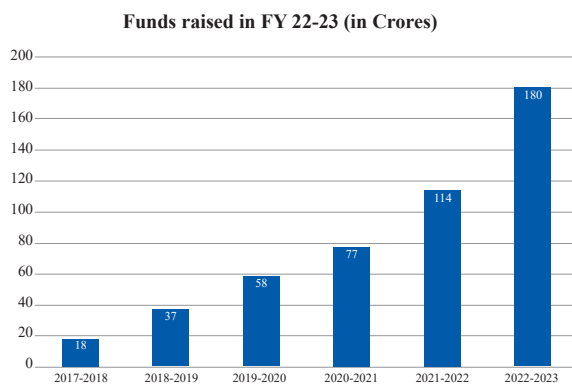
The total value of new MOUs signed in FY 2022-23 was Rs. 167 crores. The contribution from both individual donors/ well-wishers and corporates/ foundations stood at 54% and 46% respectively. The MOUs signed will serve as a strong pipeline for the Institute to fund projects in the upcoming years in various priority areas such as research, infrastructure,

student development, faculty development and more.

MoUs signed during financial year 2022-23:

MoUs signed in FY 22-23 bycategory (in crores)

74.36; 44.54% 89.6; 53.67%
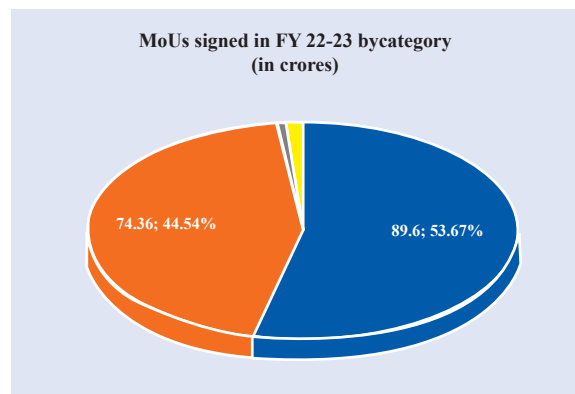
1. The major initiatives for which the donations were received are as under:

a) New Centres:

With generous support from its alumni, IIT Bombay witnessed the set up of various new Centres on campus. Through these Centres, the Institute aims to further advance research in emerging science and technology. The Koita Centre for Digital Health (KCDH) was established with a generous contribution received from its alumni Rekha and Rizwan Koita Koita (B.Tech., Metallurgical Engineering and Materials Science and Electrical Engineering, 1992, respectively), under the aegis of the Koita Foundation (www. koitafoundation.org). This Centre is the first-of-its-kind in India, focused on driving academic programs, research and industry collaborations in digital health. Through the generous donation of Dr. Pramod Chaudhari (B.Tech., Mechanical Engineering, 1971), Pramod Chaudhari Alumni Continuing Education Centre (PCACEC) was established for the Alumni Continuing Education program. Through this program, the alumni can keep pace with technological advancements in engineering and science while understanding its

implications on the world and specifically their businesses. The Sunita Sanghi Centre of Aging and Neurodegenerative Diseases (SCAN) was established with a focus on diagnostics and early detection of ageing and neurodegenerative diseases and movement support. The Centre has been supported by a generous funding from IIT Bombay's distinguished alumnus Mr Sharad Sanghi (BTech., Electrical Engineering, 1989) in memory of his late mother Mrs. Sunita Sanghi. Set up in February 2020, the Centre for Machine Intelligence and Data Science (C-MInDS) aims to contribute towards the growing significance of the role of Artificial Intelligence, Data Science and related areas in different application domains. C-MInDS is supported by founding contributions from Mr. Mohan Lakhamraju (B. Tech., Computer Science and Engineering, 1998), Mr. Beerud Sheth (B.Tech., Computer Science and Engineering, 1991), Mr. Arpit Mathur (B. Tech. and M.Tech., Computer Science and Engineering, 2006), Mr. Kashyap Deorah, Ms. Shruti Mahajan Deorah (B.Tech. Electrical Engineering, 2003) and other corporate contributions such as Gupshup.

Infrastructure Projects:

IIT Bombay alumni have contributed significantly over the years to the Institute's pursuit of excellence by setting up 'Class Legacy' projects to help the Institute in its most important initiatives and thus establishing their legacy.

One of the major initiatives was Design and Making Labs, which will allow students to gain access to top-of-the-class equipment for mechanical and electronic work including 3D printers, laser cutters and the latest workstations with Computer-Aided Design (CAD) software. The labs form an essential part of the Institute's larger Makerspace initiative that envisions providing a comprehensive education to students through exposure to state-of-the-art thematic labs. This first-of-

its-kind initiative at the Institute will train students to combat and overcome challenges found in real-world industrial setups, through a multidisciplinary course.

Two major Design and Making labs were inaugurated recently. The 'Class of 1980 Design and Making Lab' was set up through the generous contribution from the Class of 1980. ▼

The 'Deepak and Maya Satwalekar Design and Making Lab' will allow the Institute to get one step closer to becoming 'Aatmanirbhar' in science and technology through indigenous means. This modern facility comprises advanced equipment and over 250 workstations and will be accessible to nearly 1,400 first-year engineering students. Essentially, the bright and curious young minds of IIT Bombay will get to learn the latest design and manufacturing practices at the very beginning of their academic journeys.

The Class of 1975 supported the Tinkerers' Lab project which was aimed at providing technical resources and training to students on the campus that are interested in technical student-led activities.

IIT Bombay setup its first-ever micro-factories on August 12, 2022 - 'Kadayam S. Srinivasan Micro-Factory' and 'Harivallabh Nagar Micro-Factory' under the aegis of the Institute's Makerspace initiative. Established through the generous donations from IIT Bombay alumni – Mr. Balaji Srinivasan (B.Tech, Chemical Engineering, 1993) and Mr. Sumeet Nagar (B. Tech, Mechanical Engineering, 1993) - these micro-factories form an integral part of the Institute's Makerspace initiative that will enable hands-on-learning for IIT Bombay students by providing them with state-of-the-

art thematic labs, as well as the latest design and manufacturing practices.

There were various initiatives by Legacy batches such as Café 92 which serves as a place for students to hang out for snacks between and after their lectures. A year after its renovation, IIT Bombay's new and improved Hostel 5 was inaugurated with a formal ceremony on July 22, 2022. The event was attended by the hostel's alumni, current student residents of the hostel and faculty members of the Institute. The building underwent a massive makeover and now features air-conditioned study rooms, additional restrooms and other modern amenities. Hostel 5 is a joint initiative between IIT Bombay, IIT Bombay Alumni Association (IITBAA) and IIT Bombay Heritage Foundation.

Other initiatives from the alumni and well-wishers are in the areas of Research facility development are the Collaborative Classroom (CC) and Experiential Learning Laboratory (ELL), housed in the Department of Electrical Engineering, which will help instructors design and execute active and hands-on learning exercises.

The 'Brijraj Chandra Mansingh Lab' set up through generous support of Mr. Sanjay Mansingh (B. Tech., Electrical Engineering, 1992), will provide the latest and advanced equipment to students pursuing innovative and cutting-edge research projects under the guidance of the Chemistry Department's faculty. This state-of-the-art facility will also cater to more than 1,000 B. Tech., 200 BS/ MSc. and 350 Ph.D. students and will be accessible through an online booking portal. The facility will continue advancing the discipline of Chemical Sciences in India and creating a societal impact. The Lab will also aid the regular upgradation of the Chemistry Department's research infrastructure.

b) Faculty Development:

i) Young Faculty Awards (YFA):

IIT Bombay is undergoing a rapid growth phase even as other institutions in India and abroad are planning to expand too. This creates significant challenges in attracting faculty to IIT Bombay. The YFA ensures that IIT Bombay offers a more attractive package to achieve better results in recruitment. The "Young Faculty

Joining Bonus", initially a Class of '82 Legacy Project, has been awarded from 2010 onwards. The class of 1978, '83, '84, '85, '88, '89, '90, '91, '92 and '93 have also contributed to this project. The project focuses on supporting young faculty in their academic pursuits in order to attract outstanding young faculty to replace retiring faculty and to augment current faculty as a key element for IIT Bombay to maintain its long-term competitiveness. A total of 92 faculty members benefited from YFA in 2022-23.

ii) Chair Professorship:

The Chair Professorship is often considered the pinnacle of an illustrious career in academia. It is also a way for top academic institutes to attract some of the best faculty members from around the world. At present, IIT Bombay has total 52 Named Chair Professorships where nine Chair Professorships were instituted in the financial year 2022-23 in the area of Human Centric Design, AI/ ML, Statistics and Mathematics, Climate Studies, Steel, Teaching Methods, Digital Trust, Civil Engineering and Chemistry.

c) Student Development:

IIT Bombay has a robust scholarship framework in place where it helps the needy students pay for the undergraduate programmes at the Institute. Scholarships help lessen the tuition cost, reduce financial burden on families of students and nurture the spirit of philanthropy among the recipients. In the academic year 2022-23, the Institute has successfully granted scholarships to 233 undergraduate students, covering tuition fees and mess fees. In addition, as a part of the Financial Aid Programme, in FY 2022-23, IIT Bombay disbursed an amount of Rs. 1.23 crore and impacted 191 students, of which 54 were undergraduate students and 137 were postgraduate students.

i) Scholarships: One way to nurture excellence amongst students is by awarding scholarships to deserving candidates. The scholarships may be named after the donor. All students are informed of various available opportunities for financial support. The Office of Dean (ACR) also works with students and alumni to identify and apply for relevant external fellowships and scholarships. The amount of scholarship is reviewed with the Institute Scholarship Committee from time-to-time to determine the viability of the same given the prevailing economic conditions. During the academic year 2022-23, the total number of scholarships supported by Dean (ACR) office was 233. Desai Sethi, IITBHF Named scholarships, D-mart foundation scholarship, Chemours scholarship and HDFC ERGO scholarships are some of the prominent scholarships.

ii) Awards and Prizes: There are a number of awards and prizes which are given during Convocation every year from the funds managed by the Dean (ACR) Office. During the year 2022-23, around 56 awards and prizes were awarded.

The awards in the name of Prof. K.C. Khillar, Mr. R.G. Manudhane, Dr. P.V. Sukhatme and Mr. Rakesh Mathur, Mrs. Rama Mathur award, Naik and Rastogi awards are some of the prominent ones given during convocation.

2. Corporate Engagements:

The financial year 2022-23 has proven to be another fruitful year for IIT Bombay in its efforts to enhance industry collaboration and build corporate relationships. IIT Bombay has more than 50 corporate partners including Bank of Baroda, National Stock Exchange, Coal India Limited, INOX, Gupshup, STEM Water, Oracle, Syrma SGS, DMart Foundation, L & T Technology, Indian Railway Catering and Tourism Corporation (IRCTC), Merck, Tecnimont, Roadstar Group, Everest Food

Products Pvt Ltd,LTI Mindtree and many more.

Some of the engagements with these corporates are ongoing and have resulted in establishment of Centers such as the Centre of Excellence in Oil, Gas and Energy (CoE OGE), JSW Group – Setting up JSW technology Hub under the Centre of Excellence for Steel Technology, Tata Trusts – Tata Centre for Technology and Design and HDFC Ergo-IIT Bombay lab as well as other research programs. It is to be noted that The Centre of Excellence (CoE) in Oil, Gas and Energy is an interdisciplinary centre of excellence sponsored by Indian PSUs (IOCL, ONGC, HPCL, BPCL, GAIL, OIL and EIL).

3. Outreach and Events

a) The Technocraft Centre for Applied Artificial Intelligence (TCA2I) was formally inaugurated by the Chief Guest for the event, Padma Vibhushan Dr. Anil Kakodkar, Chancellor, Homi Bhabha National Institute; Chairman, Rajiv Gandhi Science and Technology Commission; and Member, Atomic Energy Commission.

TCA2I has been established through the generous donation made by the Institute's distinguished alumni Dr. Sharad Kumar Saraf (BTech, Electrical Engineering, 1969) and Mr. Sudarshan Kumar Saraf (BTech, Mechanical Engineering and Manufacturing Engineering, 1970) through their publicly listed company, Technocraft Industries India Limited.

b) Institute Valedictory function

The Institute's Valedictory Function was held on May 04, 2022 to commemorate as well as celebrate the journey of graduating students' at the Institute. The speakers for the event were IIT Bombay distinguished alumni Dr. Ganesh Natarajan (Class of 2005, Chairman and Co-Founder at 5F World Pvt. Ltd.) and Mr. Arun Firodia (Class of 1965, Chairman at Kinetic). Overall, 900 students attended the event.

c) FAN 2022 - Ohio State University

The 2022 edition of the Faculty Alumni Network (FAN) meeting, hosted by IIT Bombay in collaboration with Ohio State University, USA was held on May 14 and proved to be a huge success. The event featured compelling and thought-provoking talks, discussions and panel sessions on emerging areas of research in science and technology by esteemed dignitaries from all over the world.

⬆ *Delegates at the Faculty Alumni Network (FAN) 2022 event held at the Ohio State University (OSU) Columbus, Ohio, USA*

d) CSR Conclave:

IIT Bombay's annual corporate social responsibility conclave 2022 'Tech for Sustainable Development', held on July 6, 2022, was a resounding success. A large number of India's biggest corporates who attended the conclave were hugely impressed at the Institute's formidable forays into critical areas of research to develop actionable, cost-effective, sustainable and scalable solutions that can solve pressing challenges of national and global importance. These include education, healthcare, rural development and agriculture, sustainability, skills and entrepreneurship, women empowerment, social and policy development.

Mr. Amarjeet Sinha, Former Advisor in the Prime Minister's Office and Retired IAS officer presided over the event as the Chief Guest in virtual mode. Ms. Sujata Saunik (IAS), Additional Chief Secretary, General Administration Department (GAD), Government of Maharashtra (India) and Takemi Fellow, Harvard University, graced the conclave as the Guest of Honour. Ms. Saunik was also a panelist in 'Climate

Change Mitigation through Technology and Innovation'. The conclave was sponsored by IIT Bombay's Wadhwani Research Centre for Bioengineering and Koita Centre for Digital Health. The event received media support from The CSR Journal. The presentations were followed by panel discussions with industry experts and faculty members on issues related to its core themes.

e) Civil Services Reunion :

Some of IIT Bombay's alumni opt for a career in the Indian Civil Services after graduating from the Institute. It is a matter of immense pride for the Institute that they are serving the nation by way of governance and making high-impact policy decisions that benefit the country.

The Institute was delighted to honour them by hosting its first-ever 'Civil Services Alumni Reunion' on campus over three-days between July 8 and 10, 2022. The event, planned by IIT Bombay Alumni Association (IITBAA), was attended by over

30 alumni from various batches. The three-day reunion was packed with activities. Several CS officers like Dr. Satish B. Agnihotri, Professor, Centre for Technology Alternatives for Rural Areas (CTARA), IIT Bombay; Mr. Ambrish Kumar, IAS officer and, currently, the Project Director at Isha Outreach; and Mr. Nandakumar Saravade, Independent Advisor, Cyber Security and Risk, Indian Police Service, shared details of their inspiring professional and personal journeys.

f) SARC Activities: A few of the activities and events that were successfully conducted by SARC under the guidance of Dean ACR office last year include: UPSC talks, Alumination, Phonathon which is a telephonic marathon by students to the Alumni and Placement Mentoring Program are few of the events.

i. Reunion Convocation:

Since the pandemic played havoc with our lives, the students from the 2020 and 2021 batches did not get to enjoy one of the best days of their college lives – their convocation ceremony in person. To make good, IIT Bombay hosted a special reunion convocation on August 6, 2022, exclusively for them. It was rewarding to see the excitement and pride on their faces as they returned to their *alma mater* to have a photo-op of them receiving their degrees in person, while also celebrating the event with their friends and peers.

ii. Alumni Student Mentorship Programme:
Alumni Student Mentorship Programme (ASMP) opened for student registrations on August 7th 2022. ASMP, an initiative by Student Alumni Relations Cell aims at creating a platform to foster meaningful mentoring relationships between alumni and current students. ASMP achieves this objective by bringing together alumni mentors and student mentees and conducts various events to enrich their mentoring experience. Around 450-500 students have been mentored during ASMP.

iii. CEO Connect 1.0:

Student Alumni Relations Cell conducted CEO Connect 1.0 on August 19, 2022 with a footfall of 400+ students. CEO Connect is a session aimed at linking today's CEOs with tomorrow's leaders. The guest of honor for this session was Mr. Bhavish Aggarwal, Founder and CEO of OLA Cabs and OLA Electric (CSE, 2008). He talked about his academics, extra-curricular activities, personal life, hobbies and
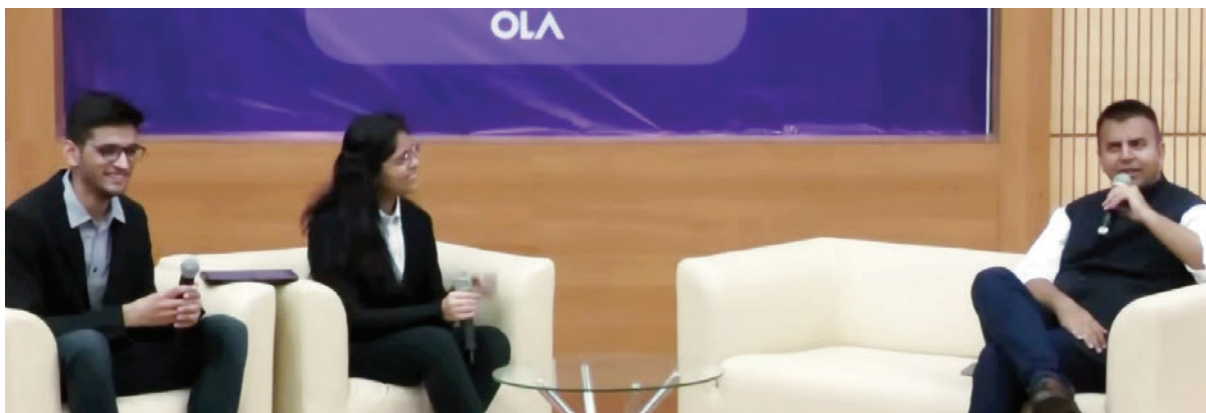
how the experiences gained at IIT Bombay shaped his life. He went further to unfold the OLA journey- the initial struggle, problems faced and lessons gained while coping with them. Overall, this event proved to be very illuminating and insightful

iv. Trust Summit-2022:

The inaugural edition of the Trust Summit, IIT Bombay Trust Lab's flagship annual event, took place on September 15, 2022. The event saw the launch of the 'IITB Trust Lab'. The Lab is a foundational initiative that envisions strengthening the country's digital environment and making it more trustworthy and also working towards a secured and responsible Digital India. Established through the generous contribution made by the Institute's alumnus Mr. Shridhar Shukla (B. Tech, EE, 1983), the lab is a huge step forward in IIT Bombay's mission of creating world-class research ecosystems in key technology areas. The Lab, to be set up in the Department of Computer Science and Engineering at IIT Bombay, will be headed by Prof. Manoj Prabhakaran, Vijay and Sita Vashee Chair Professor at the Institute. ▼

v. Bengaluru Alumni Meet:

IIT Bombay, in collaboration with the IIT Bombay Alumni Association Bengaluru Chapter, hosted the much-awaited interactive and networking session with its alumni members based in Bengaluru between November 05 -06, 2022. The gathering was a lively and spirited affair with around 450 members in attendance.

The event was presided over by IIT Bombay's Distinguished Alumnus, Dr. K Sivan, former chairman of the Indian Space Research Organization (ISRO) and Secretary, Department of Space. Dr. Sivan addressed the audience and spoke about his glorious professional journey with ISRO.

Prof. Ashok Misra, former Director of IIT Bombay also spoke at the occasion. He highlighted the strong kinship that the Institute has built with its alumni over the years. He also commended the unique ways (collaborations, volunteering opportunities, etc.) through which IIT Bombay has involved its alumni community in its journey of excellence. Prof. Subhasis Chaudhuri, Director, IIT Bombay, presented the Institute's milestones over the decades and the way forward.

In addition, IIT Bombay's alumnus Mr. Vamsi Krishna (B. Tech, Civil Engineering, 2005) and CEO and Co-Founder, Vedantu, gave a talk and encouraged young alums to contribute towards the thriving entrepreneurial ecosystem that IIT Bombay has fostered.

vi. Women Gen Zero:

IIT Bombay honored and celebrated the exceptional achievements of 30 of its women alumni with a special event, the 'IIT Bombay Gen Zero Women Initiative', held at the IIT Bombay campus on September 23, 2022.

The Institute felicitated its women alumni who represent the initial years of IIT Bombay since its establishment in 1958. A coffee table book, 'Her Story- IIT Bombay Gen Zero Women' and a podcast series, highlighting the inspiring journeys of these accomplished women from diverse fields such as research, business, academia, technology, public service and more were launched during the occasion.

Padma Shri awardee and former captain of the Indian Women's Cricket Team Ms. Diana Edulji and Founder and CEO of Nykaa Ms. Falguni Nayar presided over the event.

The Institute is indebted to its alumnus, Mr. D.C. Agrawal (B.Tech, Mechanical Engineering, 1969), his late wife, Ms. Renu Agrawal and the IIT Bombay Heritage Foundation for their generous contribution to this initiative.

vii. Various reunions:

For the first time in the history of IIT Bombay, nine batch reunions were hosted in a single year. These included the Diamond jubilee reunion of the C'1962, Golden Jubilee Reunion of C'1970, C'1971 and 72, Silver jubilee reunion of the C'1997 and 95, Decennial Reunion of C'2010, C'1983 amongst others. More then 1,000 alumni attended these reunions on campus. The C' 1997 pledged a sum of Rs. 26 crore to their beloved *alma mater*, this is the highest amount pledged by a silver jubilee batch yet.

viii. Roadshows:

a) **US Roadshow:**
A delegation from IIT Bombay featuring Dr. Sharad Saraf, Chairperson, Board of Governors, IIT Bombay; Prof. Subhasis Chaudhuri, Director, IIT Bombay; Prof. Ravindra D. Gudi,

Dean, Alumni and Corporate Relations (ACR); Mr. Ravishankar Gedela, CEO, Development Resource Foundation (DRF); Ms. Dipti Datye, Associate Vice President-Marketing and Communications, DRF and Ms. Sreemoyee Sharma, Senior Manager-Major Donor Engagement visited the US for the annual 'US Roadshow,' held during November 11- 21, 2022. In a first, the delegation covered a total of five cities- Houston, San Francisco, Los Angeles, Seattle and New York. The delegates met and interacted with nearly 500 alumni during the visit.

b) **Australia and Singapore Roadshow:**

The series of alumni meets for 2023 kicked off in Australia (Sydney and Melbourne) and Singapore and was very well attended by IIT Bombay alumni. The team from IIT Bombay welcomed 35 alumni in Melbourne, 38 in Sydney and 118 in Singapore. Alumni members ranged across a wide spectrum of batches – from the mid-1960s to the more recent graduates from 2022. While the meets were held at The Park Royal Hotel in Melbourne and Sydney, the legendary Raffles Hotel was the venue in Singapore.

ix. **FAN/ DAM 2023:**

IIT Bombay hosted the Faculty Alumni Network (FAN) – Distinguished Alumni Meet (DAM) 2023 from March 31 – April 2 at Fishermen's Cove, Chennai. The FAN-DAM event returned to India after a period of four years and assembled several of IIT Bombay's accomplished alumni serving in the industry and academia together with senior administration and faculty from IIT Bombay. Together, they deliberated on several strategic matters related to the growth of the Institute as well as research forays.

The FAN meeting witnessed discussions on emerging and relevant areas of research including semiconductors, circular economy, health sciences and AI/ML amongst others. The DAM saw our distinguished alumni deliberating on critical topics such as faculty value proposition and the holistic development of students that can fuel the Institute's continued development.

x. **GO IITB Campaign:**

IIT Bombay launched the 2022-23 edition of its annual GO IITB fund-raising campaign for various critical and timely initiatives on campus.

IIT Bombay asked its extensive alumni community to rally around and donate generously to its alma mater. With its alumni's

support, the Institute hopes to create a bright future for the next generation of scientists, researchers, entrepreneurs and thought leaders. This will, in turn, allow IIT Bombay to take the lead in nation-building and solve challenges of national and global importance.

The Institute identified the following five critical categories for this year's GO IITB campaign: Student Scholarships, IT Hardware, Institute Development Fund (IDF), Project Evergreen – Alumni-Led Student Housing and Young Faculty Awards (YFA).

xi. DSSE Entrepreneurship Symposium:

On January 31, 2023 IIT Bombay's Desai Sethi School of Entrepreneurship (DSSE) hosted a hybrid entrepreneurship symposium on campus. Thought leaders from academia, industry and the government converged together to discuss the evolving role of entrepreneurship education and the entrepreneurship ecosystem in the country.

Prof. Meric Gertler, President, University of Toronto, was the Chief Guest and keynote speaker at the occasion. IIT Bombay's Distinguished Alumnus Mr. Bharat Desai, whose contributions and support helped set up the DSSE, joined the symposium virtually for a fireside chat.

xii. SCAN Inauguration

The Sunita Sanghi Centre of Ageing and Neurodegenerative Diseases (SCAN) was launched on January 9, 2023. The Centre has been set up with a generous donation from our alumnus Mr. Sharad Sanghi (B. Tech., Electrical Engineering, 1989) and his family, in memory of his late mother, Ms. Sunita Sanghi.

The Centre was inaugurated with a special ceremony held on campus. It was presided over by Dr. Pratima Murthy, Director, National Institute of Mental Health and Neurosciences (NIMHANS). Dr. Murthy delivered an insightful keynote, drawing on her 30+ years of extensive experience in the field of mental health.

The gathering also witnessed a well-rounded panel discussion on the challenges and solutions of healthy ageing and combating neurodegenerative diseases, moderated by Prof. Samir Maji, Professor-In-Charge, SCAN. The panelists included: Prof. Vidita Vaidya, Department of Biological Sciences, Tata Institute of Fundamental Research; Prof. Sangeeta Ravat, HoD, Neurology at Seth G. S. Medical College and KEM Hospital; Prof. Prabhir Vishnu Poruthiyil, Assistant Professor Ashank Desai Centre for Policy Studies, IIT Bombay, in addition to Dr. Pratima Murthy.

xiii. Following Named Lectures were held last year:

Prof. N.R. Kamath Distinguished Lecture: Prof. Shankar P. Bhattacharyya, Professor of Electrical Engineering, Robert M. Kennedy Professor at Texas A&M University

Prof. N.R. Kamath Distinguished Lecture was held on August 16,2022 by Prof. Shankar P. Bhattacharyya, Professor of Electrical Engineering and the Robert M. Kennedy Professor at Texas A&M University.

Prof. N. R. Kamath Memorial Webinar On September 28,2022 The key speaker for the webinar were Prof. K. V. Krishna Rao, Deputy Director, Finance and External Affairs and Professor, Department of Civil Engineering, IIT Bombay; Prof. Ram Pendyala, School Director (ACD) and Professor, School of Sustainable Engineering and the Built Environment, Arizona State University and Mr. Shekhar Chandrakant Deshpande, Chief, Town and Country Planning, MMRDA.

Institute Distinguished Lecture (in memory of Prof. K. C. Khillar on January 19, 2023, by Dr. Ravi M. Shanker, renowned Senior Research Fellow at Pfizer Worldwide R&D.

Shashwat Panda Memorial Lecture by Pureheart Capital on March 30, 2023 by Mr. Ram Kelkar, Principal and Managing Director - Capital Markets Group at Milliman Financial Risk Management LLC.

INSTITUTE EVENTS

⬛ *Awardees with the Chief Guest Sajjan Jindal (in Center) and IIT Bombay dignitaries during 64th Foundation Day celebration*

64th Foundation Day: The Indian Institute of Technology Bombay celebrated its 64th Foundation Day on March 10, 2023 by honouring the contributions of its faculty members as well as alumni who have left their mark in their chosen fields of profession. Mr. Sajjan Jindal, Chairman, JSW Group of Companies, graced the occasion as the Chief Guest of the function. The Prof. S.C. Sahasrabudhe Lifetime Achievement Award (2022-23) was conferred on **Prof. Devang V. Khakhar**, former Head of Department of Chemical Engineering (2002– 04) and Director of IIT Bombay from 2009 - 2019, in recognition of his outstanding contributions as teacher, researcher and administrator, during the Foundation Day celebration.

The **'Prof. S. C. Bhattacharya Award for Excellence in Pure Sciences'** for 2022 was conferred on Prof. Samir Maji, Department of Biosciences and Bioengineering and Prof. Debabrata Maiti, Department of Chemistry and **'Prof. H. H. Mathur Award for Excellence in Applied Sciences'** for 2022 was conferred on Prof. V.S. Raja, Department of Metallurgical Engineering and Materials Science. The Institute recognised 11 select alumni of IIT Bombay, with the **Distinguished Alumnus Awards** (DAA) and four select alumni of IIT Bombay, who have excelled in their field of work and made the Institute proud, with the **Young Alumni Achiever Awards (YAAA)**, during the function.

DAA Awardees

- Prof. Kishor Trivedi (BTech, Electrical Engineering,1968)
- Mr. Ramanan Ramanathan, (BTech, Electrical Engineering, 1981)
- Mr. Salil Parekh (BTech, Aerospace Engineering, 1986)
- Mr. Rangarajan (Raghu) Raghuram (MS, Electrical Engineering, 1986)
- Prof. Vikram Sadanand Adve (BTech, Electrical Engineering, 1987)
- Prof. Sarita Adve (BTech, Electrical Engineering, 1987)
- Dr. Divesh Srivastava (BTech, Computer Science and Engineering, 1987
- Mr. Beerud Sheth (BTech, Computer Science and Engineering, 1991)
- Mr. Abhijit Dubey (BTech, Mechanical Engineering, 1997)
- Prof. Sanjit Arunkumar Seshia (BTech, Computer Science and Engineering, 1998)
- Mr. Mohana Krishna Lakhamraju (BTech, Computer Science and Engineering,1998)

YAAA Awardees

- Mr. Vijay Krishnan (Dual Degree, Computer Science and Engineering, 2005)
- Mr. Akshay Saxena (Dual Degree, Chemical Engineering, 2006)
- Prof. Srikanth Jagabathula (BTech., Electrical Engineering, 2006)
- Prof. Sushant Sachdeva (BTech, Computer Science and Engineering, 2008)

Interim-session of 61st Convocation

The Indian Institute of Technology Bombay (IIT Bombay) awarded degrees to 312 students at the interim session of its 61st Convocation held on February 25, 2023 at the Institute's Convocation Hall.

During the function, 333 degrees were awarded, which included 184 PhDs. For the first time IIT Bombay issued B.Sc. (3 years) degrees to 18 students who preferred an early exit as per NEP 2020. In addition, 133 degrees including 29 B.Tech., 3 B.Des., 4 BS, 7 M.Tech., 3 M.Sc., 1 M.Sc (integrated), 13 MS by Research, 4 DD (B.Tech.+M.Tech.), 2 DD (M.Tech.+MS by Research), 4 DD (M.Sc.+MS by Research), 6 PGDIIT, 39 (E-MBA) and 18 B.Sc.(Engg.) degrees were awarded to 128 students. (*figures are as on February 23, 2023). The degrees were conferred upon those students who have completed all the requirements during the period from August 2022 to January 2023 and had requested for the degree to be awarded earlier than the 61st Convocation. Dr. Anand Deshpande, Founder, Chairman and Managing Director, Persistent Systems Limited was the Chief Guest of the function. The function was presided by the Chairman of the Board of Governors, IIT Bombay, Dr. Sharad Kumar Saraf and the Director Prof. Subhasis Chaudhuri gave away the degrees.

Commencement Ceremony

~ 2500 students attended the ceremony with their batchmates and family

IIT Bombay held Commencement 2023 on May 2, 2023. The Hon'ble Minister of Education and Skill Development and Entrepreneurship Mr. Dharmendra Pradhan was the Chief Guest at the ceremony and addressed the students online in the presence of the Guest of Honour Dr. Anil Kakodkar, Chancellor, Homi Bhabha National Institute; Chairman, Rajeev Gandhi Science and Technology Commission; and Member, Atomic Energy Commission.

IIT Bombay introduced a new form of convocation called Commencement Ceremony, for the first time starting this year. The convocation of IIT Bombay is usually held in August every year. In the past, many students were not able to attend the convocation as they had already moved out of campus to pursue higher education or employment opportunities by August. The parents of the graduating students also missed the opportunity to see their ward graduating in person. In order to facilitate the right of passage of prospective graduates, the Senate of IIT Bombay approved a new form of celebration called the 'Commencement Ceremony' by replacing the existing notion of Convocation.

Since Commencement 2023 was held immediately after end-Sem exams in May while all the students were still on campus, a majority of them along with their parents attended the programme in person. All students whose academic programme duration notionally ended by July 2023 or had already ended could participate in the Commencement Ceremony. Graduands attended the function in a white attire with uttariya, as has been the practice.

The Commencement Ceremony resembled the convocation. However, 'Commencement Ceremony' did not involve awarding of any degree certificates since the students were yet to complete their academic requirements. Although most of the students were expected to graduate by August 2023, a few may take a little longer to complete the necessary course credits. Degrees were awarded during August 2023 in the respective academic departments, after verification of graduation requirements.

During the afternoon session of the Commencement ceremony, 2500 students were invited for a photo opportunity with the Director on the dais. Parents and relatives witnessed their wards participate in the commencement programme. Hence, all students of a batch were able to do the Commencement walk in front of their batch-mates and family members irrespective of their year of graduation.

60th Convocation: The 60th Convocation of IIT Bombay was held on August 20, 2022. Mr. Kumar Mangalam Birla, Chairman, Aditya Birla Group was the Chief Guest and delivered the Convocation Address. The Convocation was presided over by the Chairperson, Board of Governors (BoG) of IIT Bombay, Dr. Sharad Saraf, in the presence of the Institute Director Prof. Subhasis Chaudhuri. The event was live-telecast on Institute's official YouTube channel. A total of 2835 degrees were awarded.

Teachers' Day: The 64th Teachers' Day celebrations was held on September 6, 2022. Prof. Gagandeep Kang, FRS, Professor of Microbiology and Laboratory Director, Division of Gastrointestinal Sciences, Christian Medical College, Vellore, was the Chief Guest on the occasion. IIT Bombay Director Prof. Subhasis Chaudhuri presented the International Award for Excellence in Research in Engineering and Technology; Professor S.C. Sahasrabudhe Life Time Achievement Award; Professor S.P. Sukhatme Award for Excellence in Teaching and Dr. P. K. Patwardhan Technology Development Award (2021). The IIT Bombay International Award for Excellence in Research in Engineering and Technology (instituted by Mr. Sandeep Naik and Mr. Shantanu Rastogi) was conferred on Dr. Santosh Ansumali, Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, in commendation of his outstanding contributions to research in engineering and technology; 'Prof. S. P. Sukhatme Award for Excellence in Teaching' to 15 select faculty members.

- Prof. Sandesh Rame, IDC School of Design
- Prof. Surya Durbha, Centre for Studies in Resources Engineering
- Prof. Rangan Banerjee, Department of Energy Science and Engineering
- Prof. Sumant Rao, IDC School of Design
- Prof. U. Anandavardhanan, Department of Mathematics
- Prof. Abhiram Ranade, Department of Computer Science and Engineering
- Prof. Sreedhara Sheshadri, Department of Mechanical Engineering
- Prof. Parag Kumar Chaudhuri, Department of Computer Science and Engineering
- Prof. Parag Bhargava, Department of Metallurgical Engineering and Materials Science
- Prof. Ravi Sinha, Department of Civil Engineering
- Prof. Usha Ananthakumar, Shailesh J. Mehta School of Management
- Prof. Varadraj Bapat, Shailesh J. Mehta School of Management
- Prof. Bernard Menezes, Department of Computer Science and Engineering

- Prof. Kishore Chatterjee, Department of Electrical Engineering
- Prof. Krishnaiyengar Narasimhan, Department of Metallurgical Engineering and Materials Science

The 'Dr. P.K. Patwardhan Technology Development Award - 2021' was awarded to Prof. Debjani Paul and her team, Department of Biosciences and Bioengineering, in recognition of their innovative R&D work on "ShapeDx: A high-accuracy, point-of-care sickle cell test".

The Teachers' Day function also witnessed the Professor S.C. Sahasrabudhe Lifetime Achievement Award of IIT Bombay being bestowed on Prof. A.K. Suresh from the Department of Chemical Engineering, IIT Bombay.

Alumni Day Celebrations: IIT Bombay celebrated its annual Alumni Day on December 25, 2022 at the IIT Bombay campus. As a part of the function, **Distinguished Service Awards** were bestowed on six alumni members this year, who besides being achievers in their own chosen domains, have contributed in a notable and sustained manner to the progress of the Institute. The awardees include:

- Mr. Ajit Jawle (B.Tech., 1977 and M.Tech.,1979)
- Mr. Nitin Pravinchandra Doshi (B.Tech., 1979 and M.Tech., 1981)
- Mr. Nandkishore Nemade (B.Tech., 1982)
- Mr. Suhas Narayan Mehta (B.Tech., 1983)
- Mr. Mayur Sirdesai (B.Tech., 1987)
- Mr. Jignesh Patel (B.Tech., 1992)

The **Chapter Service Awards**, instituted during the Diamond Jubilee year celebrations, were conferred on

- Mr. Rajendra Melville (B.Tech., 1974)
- Mr. Rijas V. Shareef (M.Tech., 2014)
- Mr. Barsopia Vivek (M.Tech., 2018)
- Mr. Suhas Damodar Deshpande (M.Tech., 1980).

The **Silver Jubilee Batch** (class of 1996) has

pledged a sum of Rs. 26 crores towards the Legacy Project during the function.

Earlier, during November 7-11, 2022, IIT Bombay Alumni Association organised the Golden Jubilee Reunion for the Class of 1972 at the Institute campus. The alumni got to interact with the well-known Indian film director Mr. Subhash Ghai as he regaled them about his personal and professional journey at an informal programme held during the reunion.

On the occasion, the new website for the office of the Dean (Alumni and Corporate Relations) was launched by the Chairman (BoG), IIT Bombay Dr. Sharad Saraf, Prof. K.V.K. Rao, Deputy Director (FEA) and Prof. Ravindra Gudi, Dean (ACR) in the presence of Institute functionaries, alumni and their family members.

74th Republic Day: IIT Bombay celebrated the 74rd Republic Day on January 26, 2023. The celebration began with the unfurling of the National Flag by the Institute's Director Prof. Subhasis Chaudhuri at the Institute's Gymkhana ground. IIT Bombay security staff and NCC gave a salute to the National Flag

International Day of Yoga: IIT Bombay celebrated the 8th International Yoga Day on June 21, 2022, to spread awareness about the benefits of yoga in daily life. Dr. Mayur V. Kaku, Neurosurgeon and Ayush Ministry certified Yoga Therapist graced the occasion as the Chief Guest. The celebration included various workshops, online quiz series, slogan writing and poster-making competition, through a

series of events over the year. The online events witnessed the participation of all the members of the IIT Bombay community. The flagship event of Yogastha named 'Yogathon: 108 Suryanamaskar Challenge' was organized in the evening where Mrs. Shammi Gupta, yoga practitioner, yoga mentor, counsellor and life coach and yoga therapist graced the event. A 'Dynamic Flow Yoga' workshop was conducted on February 12, 2022 by Dr. Yogi Sumit Thalwal, a multi-style teacher with certifications in Hatha, Vinyasa, Ashtanga, Yin and Iyengar styles of Yoga. He is an E-RYT 200, RTY 500 Yoga Alliance Certified teacher and is leading 200, 300 and 500 programmes at Maa Shakti Yog. The workshop focused on looking within and finding the inner peace that is not ruffled and riled by constant stresses and struggles of life. The Instructor helped to understand the intricacies of the proper techniques, postures, asanas and much more. Yogastha organized a three-day Hatha Yoga and Pranayama workshop by Mr. Dinesh Srichand Mulchandani, a certified yoga instructor during May 17-19, 2022.

76th Independence Day: The celebration began with the unfurling of the national flag by the Institute's Director Prof. Subhasis Chaudhuri. Later, he addressed the gathering. As part of *Azadi Ka Amrit Mahotsav* (75 years of India's Independence), IIT Bombay had arranged Akhand Deep (Lighting of lamp) in remembrance of martyrs of the Indian Freedom Struggle in the Main Building during August 13-15, 2022. Director Prof. Subhasis Chaudhuri and Registrar Mr. Ganesh Bhorkade lit the Akhand Deep at 10 am on August 13, 2022 in the presence of other Institute employees. On this occasion, the Institute had also made arrangements to showcase films on 'National War Memorial' and 'Partition Horrors Remembrance Day' at the same venue for three days starting August 13, 2022.

Various competitions, including elocution, essay writing and drawing were conducted by the IIT Campus School & Junior College, IIT Powai. A play skit on the theme 'Har Ghar Tiranga, Ghar Ghar Tiranga' was also performed by School

students on the occasion.

Kendriya Vidyalaya, IIT Powai, Mumbai organised a 'Har Ghar Tiranga' campaign from August 13-15, 2022.

- About 689 students and teachers took part in 'Prabhat Pheri', presenting a unique example of love and passion for the country.

- More than 400 students from Classes VI to IX participated in the poster-making competition

On the occasion of Independence Day, Team Shunya along with various Institute bodies enthusiastically planted over 250 plants nation-wide as a small step towards Green India.

Van Mahotsav: To maintain the greenery of the campus and spread awareness on environment conservation, Van Mahotsav was celebrated at IIT Bombay on July 30, 2022. Around 400 plant saplings were planted inside the campus.

Swachhata Pakhwada: IIT Bombay observed Swachhata Pakhwada during September 1-15, 2022. The Institute started a number of initiatives during Swachhata Pakhwada to contribute to a tidy and clean environment by participating in various cleanliness and sanitation-related activities. The Institute initiated various activities during Swachhata Pakhwada to contribute towards a neat and clean environment which includes administration of Swachhata Pledge, campaign to improve wet, dry, sanitary and ewaste segregation at the source, awareness campaigns in Kendriya Vidyalaya-IIT Powai and IIT Bombay Campus School and Jr. College-Powai etc.

Birth Anniversary of Mahatma Gandhi and Lal Bahadur Shastri: On their birth anniversary, IIT Bombay paid homage to the Father of the Nation Mahatma Gandhi and former Prime Minister Lal Bahadur Shastri. The Institute Cultural Council organized the Jayanti celebrations at P.C. Saxena Auditorium. IIT Bombay functionaries, including Director Prof. Subhasis Chaudhuri; Dean (Student

Affairs) Prof. Tapanendu Kundu; Registrar Mr. Ganesh Bhorkade and Institute Cultural Chairperson Prof. Somnath Basu, lighted the lamp and paid floral tributes to Gandhiji and Shastriji on October 02, 2022.

Rashtriya Ekta Diwas: The Indian Institute of Technology Bombay commemorated the birth anniversary of the Iron Man of India, Sardar Vallabhbhai Patel, by observing National Unity Day (Rashtriya Ekta Diwas) on October 31, 2022. The 'Rashtriya Ekta Diwas Pledge' was administered to employees of IIT Bombay in Hindi by the Registrar Mr. Ganesh Bhorkade and in English by Joint Registrar - Human Resources, HR-2 (HCM) Section Dr. K. V. Reghuthaman at the ground floor foyer of IIT Bombay's Main Building. On the occasion of Rashtriya Ekta Diwas, a 'Unity Run' was also organised by the Institute on its campus.

Vigilance Awareness Week: To observe Vigilance Awareness Week from October 31-November 06, 2022, IIT Bombay staff undertook a pledge to promote integrity in public life and achieve a corruption-free society. The 'Integrity Pledge' was administered to employees of IIT Bombay in Hindi by Deputy Registrar (Human Resources-I) Mr. C.P. Joglekar and in English by Joint Registrar-Human Resources, HR-2 (HCM) Section, IIT Bombay Dr. K.V. Reghuthaman at the ground floor foyer of IIT Bombay's Main Building. IIT Bombay staff pledged to foster a culture of honesty and integrity and to remain committed to good corporate governance-based transparency, accountability and fairness. This year's theme of Vigilance Awareness Week was "Corruption-Free India for a Developed Nation". The Vigilance Cell of IIT Bombay has also organised an essay-writing competition for the campus community on the topic "Corruption Free India: Steps Ahead for Developed India".

National Constitution Day: As a part of National Constitution Day (Samvidhan Diwas), IIT Bombay organised a workshop titled "How to Achieve Success in Various Competitive Examinations?" on November 26, 2022. The

Registrar Mr. Ganesh Bhorkade conducted the workshop. He shared various tips to succeed in competitive examinations. The workshop was well-attended by the staff and residents alike.

National Education Day: IIT Bombay commemorated the birth anniversary of India's first education minister of independent India, Maulana Abul Kalam Azad, by observing National Education Day (Rashtriya Shiksha Diwas) on November 11, 2022. Mr. Amit Sharma, Managing Director and CEO of Tata Consulting Engineers Limited, was the Chief Guest on the occasion. As part of the celebration, the IRCC Research Awards - 2021 were conferred on select faculty during the programme.

National Science Day: IIT Bombay celebrated National Science Day to commemorate the discovery of the 'Raman Effect' by Sir C.V. Raman for which, he was awarded the Nobel Prize in Physics in 1930. As part of this celebration, the Institute organized a lecture on "Bioinspired synthesis of organic molecules" by Prof. Debabrata Maiti, Department of Chemistry on February 28, 2023.

International Women's Day: The Gender Cell at IIT Bombay celebrated International Women's Day on March 16, 2023, to raise awareness about the status and dignity of women among the faculty, staff and students, as well as to take forward the ideas of gender equality, equity of resources and women empowerment. Two distinguished women, Prof. Rohini Godbole, Padma Shri, a physicist and Dr. Aparna Hegde, an internationally renowned urogynecologist and the founder of the maternal and child health care NGO ARMMAN, graced the occasion as speakers. Deputy Director (Academic and Infrastructural Affairs) Prof. S. Sudarshan, shared the necessity of women empowerment in the current day and age and talked about the increase in female student and faculty engagement on campus, as well as about the steps the institute takes to ensure that women get equal opportunities on campus.

Matribhasha Diwas: The Indian Institute of

Technology Bombay celebrated Matribhasha Diwas (International Mother Language Day) on February 21, 2023 by organising a cultural programme at P.C. Saxena Auditorium. Over 40 participants, including students of IIT Campus School and members of various cultural associations of the Institute, performed different art forms during the cultural programme highlighting the rich heritage of their respective mother languages.

World Environment Day: The Institute community participated in various initiatives to mark the occasion of World Environment Day. The Registrar of IIT Bombay Mr. Ganesh Bhorkade and IIT Bombay staff along with students of Kendriya Vidyalaya School, IIT Powai planted saplings in the campus on June 5, 2022. More than 300 volunteers from IIT Bombay cleared approximately 2.5 tonnes of garbage on a 2-km stretch along Powai Lake on June 5, 2022 to mark World Environment Day. The drive was a collaborative effort by Abhyuday, IIT Bombay's social body and Project Mumbai.

International Day of Clean Air for Blue Skies: To address the need for collective understanding, accountability and action to solve the pernicious issue of poor air quality in India, IIT Bombay celebrated the International Day Of Clean Air For Blue Skies on September 7, 2022 through two events at the school level and at the Institute level.

Branding of G20: The Institute has promoted and implemented the use of G20 logos on all its publicity materials used for various events such as printing the logo on posters, banners, letterhead, social media and other media outlets etc. At some events such as International Day of Yoga etc. t-shirts printed with the G20 logo on them were distributed to participants and volunteers.

Model G20 Winner: Ms. Malvika Jayakumar, PhD student of the Department of Humanities and Social Sciences was declared as one of the winners of the debate competition on 'Circular

economy and lifestyle for the environment' organised under the National level Model G-20 initiative.

Jal Shakti Abhiyan (JSA):

IIT Bombay organized a slogan contest on "Catch the Rain for Sustainable Development during January 2023 as per the directives of The Ministry of Jal Shakti, the committee led by Prof. Pennan Chinnasamy, CTARA.

International Year of Millets:

IIT Bombay organized various events to observe the "International Year of Millets" with an aim to create awareness and increase the production and consumption of millets.

Following events were conducted during the year:

Institute Lecture sessions on "Step into the World of Millets!" and "Potential of Millets: From Farm to Plate' on September 29, 2022 and November 23, 2022, respectively.

Slogan and Poster Competition: A slogan-writing competition with the theme "India's Wealth, Millets for Health" and a poster-making competition with the theme "Millets to Millions".

⬆ **Joint-Workshop On Millets:** IIT Bombay and India Tourism Mumbai jointly organized a workshop on February 28, 2023 at IIT Bombay. Mr. D. Venkatesan, Regional Director (West and Central Region), India Tourism, welcomed and introduced the guest speaker. Mr. Jerson Fernandes, Executive Chef at Novotel Mumbai, hosted the session on importance of millet and an

on-the-spot quiz during the workshop. Students from various colleges in Mumbai attended the workshop in large numbers.

Introduction of Millet dishes: To promote a healthy lifestyle, hostels, staff canteen in IIT Bombay introduced and prepared millet-based dishes in their daily menu like raagi dosa, bhakri, thalipetth, nachani chips to celebrate International Year of Millets.

Millet Bazaar: The Institute organised a weekly Millet Baazar on its campus, where farmers from various locations displayed and sold millets at this weekly market.

Fit India Movement

The Institute has taken steps to make the Faculty, Staff and Students alike indulge in fitness and sports activities to support the Fit India Movement, launched by Prime Minister of India Shri. Narendra Modi at Indira Gandhi Stadium in New Delhi on August 29, 2019 (National Sports Day).

Various sporting activities were conducted viz. General Awareness and Basic Fitness; Fitness and Learning; Fitness tests; workshops; General Session on Health/ Fitness; (Inter-Hostel) competitions; various conditioning sessions and game practices; Cardiovascular Fitness and Conditioning; Sports Fest Aavhan 2023,etc. PArticipation in 27th Inter-IIT Staff Sports Meet and 55th Inter-IIT Sports Meet.

Veer Baal Diwas

Under the aegis of Azadi Ka Amrit Mahotsav, IIT Bombay commemorated Veer Baal Diwas to honor the martyrdom of Baba Fateh Singh and Baba Zorawar Singh, the Sahibzade of 10th Shri Guru Gobind Singh Ji, on December 26, 2022.

A digital exhibition was arranged at IIT Bombay on December 26, 2022 to showcase the life and sacrifice of Baba Zorawar Singh ji and Baba Fateh Singh ji.

Inauguration of Rahul Bajaj Technology Innovation Centre

The Rahul Bajaj Technology Innovation Centre (RBTIC) at the Indian Institute of Technology Bombay was inaugurated on June 10, 2022 by the Chief Guest Dr. R. A. Mashelkar, former Director General, Council of Scientific and Industrial Research (CSIR), in the presence of Mr. Niraj Bajaj, Chairman, Bajaj Auto Limited, Director of Bajaj Group of companies and CMD of Mukand Limited and Director of IIT Bombay Prof. Subhasis Chaudhuri. Several members of the Bajaj family also attended the function. The inauguration ceremony celebrated the late Mr. Rahul Bajaj's immense contributions to IIT Bombay in the presence of his family members.

Media Delegation From LAC Countries visits IIT Bombay

A delegation comprising 35 journalists/ editors from Latin American and Caribbean (LAC) countries visited IIT Bombay on March 28, 2023, as part of a familiarisation programme organised by the Ministry of External Affairs, Government of India for foreign media. IIT Bombay's Deputy Director (Academic and Infrastructural Affairs) Prof. S. Sudarshan and Dean (International Relations) Prof. Amit Agrawal interacted with the delegation. The delegation also visited the IDC School of Design to get a broader perspective of the curriculum taught at the School.

Parliamentary Standing Committee visits IIT Bombay

The Parliamentary Standing Committee for Education, Women, Children, Youth and Sports led by Chairman Hon'ble MP Mr. Vinay P. Sahasrabuddhe visited IIT Bombay on May 27, 2022. The Director of IIT Bombay Prof. Subhasis Chaudhuri presented an overview of the Institute's progress and new initiatives over the years. The Committee also had an interaction with key IIT Bombay functionaries.

Awareness workshop on National Credit Framework

IIT Bombay held Awareness Workshop on National Credit Framework (NcrF) on November 28, 2022. Hon'ble Minister of State for Education Smt. Annpurna Devi was the Chief Guest. Institute's Director Prof. Subhasis Chaudhuri welcomed the Hon'ble Minister.

Dr. Vinita Aggarwal, Executive Member and Lt. Col. Gunjan Chowdhary, Director, NCVET, Dr. Saroj Sharma, Chairperson, NIOS, Dr. Avichal Kapur, Joint Secretary, UGC, Mr. Nilambuj Sharan, Senior Economic Advisor, MSDE, Prof. Rajive Kumar, Member Secretary, AICTE, Prof. Vinay Swarup Mehrotra, Joint Director, PSSCIVE, Bhopal and Ms. Niti Shankar Sharma, Dy. Secretary, CBSE were the panelists who spoke in length about various aspects of National Credit Framework.

The workshop was aimed to provide all with an opportunity to recognize applied aspects of knowledge and skills. It will also create new possibilities for lifelong learning and skilling,

boosting per capita productivity, empowering all and laying a strong foundation for India to lead this century.

United Nations Secretary-General Mr. Antonio Guterres Visits IIT Bombay

The Indian Institute of Technology Bombay hosted the Secretary General of the United Nations Mr. Antonio Guterres on October 19, 2022.

Mr. Guterres delivered the UN Day Public Lecture titled "India at 75 – India UN Partnership – Strengthening South-South Cooperation". The UN Chief, in his address, urged the students to work on solutions to climate change and desist from working for those who are wrecking the climate.

Esteemed guests, including Ms. Ruchira Kamboj, India's Permanent Representative to the United Nations; Mr. Shombi Sharp, UN Resident Coordinator in India; Ms. Dia Mirza, actress and Goodwill Ambassador of United Nations Environment Programme (UNEP); Mr. Samir Saran, President of Observer Researcher Foundation (ORF); delegates from the Ministry of External Affairs (MEA), Government of India and United Nations India, graced the occasion.

Pariksha Pe Charcha

On the occasion of the 6th edition of Pariksha Pe Charcha 2023 event held on January 27, 2023, email invites to all faculty, staff and students were sent to attend the screening of 6th edition of Pariksha Pe Charcha 2023 at P.C. Saxena Auditorium.

The students and teachers of IIT Campus School & Jr. College and Kendriya Vidyalaya were also sent the invite to attend the live screening of the 6th edition of Pariksha Pe Charcha 2023.

Banner was put up on the campus for wider dissemination.

- The 6th edition of Pariksha Pe Charcha 2023 banner was displayed on the IIT Bombay website

- The #PPC2023 event was shared from the official social media handles of IIT Bombay.

- The Institute had arranged for the screening of the 6th edition of Pariksha Pe Charcha 2023 in the P.C. Saxena Auditorium of the Institute.

Institute Lecture/ Colloquium/ Conference/ Workshops:

Prof. Supriyo Bandyopadhyay, Commonwealth Professor of Electrical and Computer Engineering, Virginia Commonwealth University, delivered an Institute Colloquium titled "Energyefficient information processing in our information hungry world?" on June 7, 2022

Prof. Dieter Suter, Department of Physics, Technische Universität Dortmund, delivered the first Colloquium of the newly found Centre of Excellence in Quantum Information, Computing, Science and Technology (CoE QuEST), IIT Bombay titled "Hybrid quantum registers: Efficient control and protection against environmental" on June 21, 2022

Prof. Andrew Thangaraj, NPTEL Coordinator and National MOOCs Coordinator in SWAYAM at IIT Madras, delivered the Institute Colloquium on "Running a large-scale UG program: The IITM experience" on September 14, 2022

Dr. Santosh Ansumali, Professor at Engineering Mechanics Unit at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) Bengaluru and Founder of Sankhyasutra Labs, Bengaluru, delivered the Institute Colloquium on "Drik Ganita: Towards realistic simulation of complex systems" on September 6, 2022

Dr. Achintya Haldar, Da Vinci Fellow, Professor Emeritus of Civil and Architectural Engineering and Mechanics University of Arizona, Tucson, AZ, USA, delivered the Institute Lecture on "Stochastic Behavior of Dynamic Systems in the Metaverse Era – Alternative to Random Vibration and Simulation" on September 21, 2022

Prof. Satish K. Tripathi, President, University at Buffalo, The State University of New York, Buffalo, New York, USA, delivered the Institute Lecture titled "Leading a Comprehensive Research University: Challenges and Opportunities" on November 24, 2022

Prof. Sylvain Baillet, Professor, Neurology and Neurosurgery, Biomedical Engineering and Computer Science, Canada Research Chair (Tier 1, CIHR) of Neural Dynamics of Brain Systems, Montreal Neurological Institute (MNI), McGill University, Montreal, Canada, delivered the Institute Lecture titled "The embodied self: the ultimate Turing test for AI? How sensory and motor predictions shape human perception and cognition" on December 19, 2022

Prof. P. M. Ajayan, Benjamin M. and Mary Greenwood Anderson Professor of Engineering, Department of Materials Science and NanoEngineering, Rice University, Houston, Texas, USA, delivered an Institute lecture titled "Materials Design through NanoEngineering" on January 12, 2023

Dr. Ravi M. Shanker, Senior Research Fellow, Pfizer Inc. USA, delivered an Institute distinguished lecture (in memory of Prof. K. C. Khilar) titled "Three Decades of Pharmaceutical Reduction to Practice of Science: Advancement of Novel Drug Delivery Technologies from Benchtop to Commercial Products" on January 19, 2023

Hon'ble Mr. Justice Uday Umesh Lalit, Former Chief Justice of India, delivered an Institute talk

titled "Administrative Law and Policy Framing" on January 23, 2023

Prof. Alejandro Frery, Professor, Victoria University of Wellington, New Zealand, delivered an Institute lecture titled "Practical Steps towards Reproducibility and Replicability" on January 24, 2023

Mr. A. S. Kiran Kumar, Vikram Sarabhai Professor, ISRO, Member, Space Commission and Former Chairman, Indian Space Research Organisation (ISRO), delivered an Institute colloquium titled "Indian Space Program: Recent Developments" on January 28, 2023

Prof. Dennis E. Discher, Robert D. Bent chaired Professor and Director of NCI-Physical Sciences Oncology Center-Project, University of Pennsylvania, Philadelphia, PA, delivered an Institute lecture titled "Universal scaling and mechanisms across tissues, tumors and nanomaterials" on January 30, 2023

Prof. Serge Haroche, Nobel Laureate in Physics (2012), College de France, Paris, delivered an Institute colloquium titled "Quantum Science with Rydberg Atoms" on February 17, 2023

Prof. Rajat Mittal, Professor of Mechanical Engineering and Professor of Medicine, Johns Hopkins University, Baltimore, USA, delivered an Institute lecture titled "Flow Physics and Computation at the Intersection of Mechanics and Bioengineering"on February 13, 2023

Prof. Dara Entekhabi, Bacardi and Stockholm Water Foundations Professor, Professor of Civil and Environmental Engineering, Professor of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology (MIT), USA, delivered an Institute lecture titled "Linkages Between the Water, Energy and Carbon Cycles in the Global Climate System" on March 13, 2023

Dr. Bharat Ratra, Distinguished Professor of Physics, Kansas State University, USA, delivered an Institute lecture titled "The Accelerating Expanding Universe: Dark Matter, Dark Energy and Einstein's Cosmological Constant" on March 14, 2023

IIT Bombay alumnus **Mr. Ram Kelkar**, delivered the Shashwat Panda Memorial Lecture by Pureheart Capital titled, "A career is a journey – not a destination: Vignettes of IITian career paths" on March 30, 2023

Conferences:

Conference on DELTAs-2022: The Department of Aerospace Engineering organized its first international conference on Lighter-than-Air Systems called the Design and Engineering of Lighter-than-Air Systems: DELTAs-2022 during June 23–24, 2022 at VMCC, IIT Bombay. A technology showcase was held to enable industry professionals and software vendors to demonstrate the application and efficacy of their products. The conference was led by Prof. Rajkumar S. Pant, Department of Aerospace Engineering.

2nd International Conference on Water Technologies 2022 (ICWT 2022): The Water Innovation Center: Technology, Research and Education (WICTRE) at the Department of Metallurgical Engineering and Materials Science, IIT Bombay, organized the 2nd International Conference on Water Technologies 2022 (ICWT 2022) during December 1-2, 2022, in a hybrid mode. Prof. Shobha Shukla, Department of Metallurgical Engineering and Materials Sciences,was the professor-in-charge of the conference.

Global Energy Futures Conclave – 2022: IIT Bombay-Monash Research Academy hosted the Global Energy Futures Conclave – 2022 during December 6-8, 2022. Professors from IIT Bombay, Monash University and industry leaders from India and Australia participated in this conclave. The 3-day

conclave saw conversations and collaborations on the future of energy for achieving net zero targets delving deeper into the challenges and opportunities critical to the themes of Carbon Capture, Utilization and Sequestration; New Technology and Policy for Energy Transition; Grid Integration – Renewable Energy and EV Mobility; Battery Storage and Materials; Green hydrogen and Ammonia; Smart Grid and IoT; Social Impact of Energy Transition and India Australia Energy Policy

4th international conference on the Science and Technology of Ironmaking and Steelmaking, STIS-2022: The 4th international conference on the Science and Technology of Ironmaking and Steelmaking, STIS-2022, was organized by the Centre of Excellence in Steel Technology (CoEST), Department of Metallurgical Engineering and Materials Science, IIT Bombay at VMCC, IIT Bombay during December 13-16, 2022. Prof. Viswanathan N Nurni, Department of Metallurgical Engineering and Materials Science, was the convener of the conference.

International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC): The 14th edition of the biennial International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC) was held at IIT Bombay during December 19-21,2022. Around 300 academicians, practitioners, managers and policymakers from all parts of the world came together to share cutting-edge research and stateof-the-art practices. Prof. Dharamveer Singh, Department of Civil Engineering, was Chairman of the conference.

"FOSS": Free and Open Source Software for Education (FOSSEE), IIT Bombay organised a Mumbai FOSS (Free and Open Source Software) conference, in collaboration with FOSS United on March 11, 2023. The conference featured a number of talks by invited speakers and was well-attended by FOSS enthusiasts.

Workshops:

Workshop on Python and Django: A two-day Python and Django workshop was conducted during April 8-9, 2022 . This workshop was organised by the Pandit Madan Mohan Malaviya National Mission on Teachers and Teaching (PMMMNMTT) and the FOSSEE (Free/Libre Open Source Software for Education) project. Both initiatives are supported by the Ministry of Education, Government of India. The convenor for this workshop was Prof. Kannan Moudgalya, Department of Chemical Engineering.

Workshop on AI: The Technocraft Centre for Applied Artificial Intelligence (TCA2I) and the Centre for Machine Intelligence and Data Science (C-MInDS) at IIT Bombay partnered on a workshop series called 'AI.Impact,' which were set to feature presentations and discussions on advances in 'Artificial Intelligence (AI) for causes of social impact'. As part of this initiative, the Centres conducted their first workshop that explored collaborations with AI for social impact during April 8- 9, 2022.

Data-Efficient Machine Learning: The Department of Computer Science and Engineering held an online workshop for Data-Efficient Machine Learning titled DECILE during April 30 - May 1, 2022. DECILE is a collaboration between CSE group at IIT Bombay and UT Dallas where toolkits are developed and other resources for data and computing efficient deep learning. The workshop was led by Prof. Ganesh Ramakrishnan, Institute Chair Professor, Department of Computer Science and Engineering and Professor-inCharge, Koita Centre for Digital Health.

Workshop on "Team Based Learning (TBL) 101": The Parimal and Pramod Chaudhari Centre for Learning and Teaching (PPCCLT) organized a workshop on "Team Based Learning (TBL) 101" on October 13, 2022. The workshop was conducted by Dr. Briju Thankachan, Executive

Director of EdTech Society and a Visiting Faculty at the Interdisciplinary Programme in Educational Technology (IDP-ET) at IIT Bombay

Workshop for Educators and Professionals in Heritage sector: IIT Bombay organized a one-day workshop on November 16, 2022 for educators and professionals in the heritage sector. The workshop introduced participants to two projects, the Indian Culture Portal and the Digital District Repository that bring together heritage and technology and seek to democratise and diversify the field of culture. The day-long programme was attended by 60 educators and academic researchers, from educational institutions across Maharashtra. Prof. Kannan Moudgalya, Department of Chemistry, was the convener of the workshop

Procurement Conclave: Indian Institute of Technology Bombay organised a first-of-itskind two-day Procurement Conclave for officers handling procurement of all IITs at the Institute campus on November 18 and 19, 2022. Officers from about 15 IITs took part in the conclave along with officials from the Ministry of Finance and Government e-Marketplace (GeM) as guest speakers

Workshop on "Understanding Patents": The Wadhwani Research Centre for Bioengineering (WRCB) conducted a two-day workshop on "Understanding Patents" during November 25-26, 2022. The objective of the workshop was to familiarise IIT Bombay innovators with the basics of intellectual property rights and various aspects of patents necessary for protecting and commercializing innovations. The workshop was conducted by Dr. Raj Hirwani, a leading expert in the field of technology management and entrepreneurship, with sessions by Dr. Nishad Deshpande and Dr. M. G. Kulkarni. Prof. Debjani Paul, Department of Biosciences and Bioengineering,was the professor-in-charge of the workshop.

Digital Wellbeing Workshop: Training and Outreach Team, Student Wellness Centre organised a online Digital Wellbeing Workshop on November 26, 2022. The workshop aimed to look into practical and tangible steps in order to have a healthy relationship with technology. Mr. Rijul Arora, an MSc.(Economics) and B.E. (Hons) in Electrical and Electronics Engineering from BITS Pilani and a Digital Wellness Educator, conducted the workshop

"Turning Conference Article into a Journal Paper": The Geospatial Information Science and Engineering (GISE) Hub, IIT Bombay organised a workshop on "Turning Conference Article into a Journal Paper" by Prof. Alejandro Frery, Professor of Statistics and Data Science with the Victoria University of Wellington, New Zealand, during January 21-22, 2023

"Reimagining Risk and Vulnerability in Indian Agriculture": As an Institute of Eminence (IoE) outreach activity, the Shailesh J. Mehta School of Management organised a workshop on 'Reimagining Risk and Vulnerability in Indian Agriculture' during March 10-11, 2023

"Administrative Procedure and Public Procurement processes": IIT Bombay organised a workshop/ interaction session titled "Administrative Procedure and Public Procurement processes" for staff members on March 4, 2023. Registrar Mr. Ganesh Bhorkade and other Institute Officers conducted the workshop.

Workshop on "Understanding Patents": Wadhwani Research Centre for Bioengineering (WRCB) conducted a two-day workshop on "Understanding Patents" during March 24-25, 2023. Prof. Debjani Paul, Department of Biosciences and Bioengineering was the professor in-charge of this workshop.

HINDI CELL

Hindi Cell is actively engaged in providing support for implementation of Hindi in the Institute. All the documents of Section 3(3) such as routine correspondence, annual reports, Institute's circulars, office orders, registers, forms, visiting cards, signboards and degree certificates are prepared in bilingual form.

During the year 2022-23, two inspections from the Ministry of Education and sub-committee of the Parliamentary Committee were organised during June and July 2022. The first inspection was done by the Department of Official Language, Ministry of Education, where the Institute Registrar and other officials including Hindi Officer appraised the inspection team about the work done in the official language in the Institute. Along with this, the team also met the Director Prof. Subhasis Chaudhuri in the presence of other officials. Suggestions and ideas were exchanged for the smooth conduct in Hindi at the Institute during the meeting. The second inspection was held in July 2022 by the first sub-committee of the Parliamentary Committee on Official Language. In this inspection, held almost after 24 years, information related to implementation of Hindi language in the Institute and details of the work done in bilingual were presented through a questionnaire sent by the committee. The same was discussed in an event held at Taj Lands End on July 12, 2022. During this inspection, all the members of the Hindi Cell including the Director, Registrar, Joint Registrar, Deputy registrar and Hindi Officer were present. After inspection, it was assured that all the requirements suggested during the meeting will be fulfilled and the supplementary report will be sent to the committee within the six months. In view of this, the Institute has expedited implementation of Hindi.

"Hindi Pakhawada" was celebrated in the Institute during September 14-29, 2022 in line with the address by the Hon'ble Union Home and Cooperation Minister Shri Amit Shah during the celebrations of Hindi Divas -2022 and Second All India Official Language Conference in Surat, Gujarat on September 14, 2022. The Hindi cell at IIT Bombay organised "Hindi Pakhwada" including a Hindi debate competition on September 17, 2022 for the students of campus school and Hindi book exhibition during September 19-20, 2022 under the guidance of Dr. Manju Naika, Chief Library Officer, Central Library, IIT Bombay. The Registrar Mr. Ganesh Bhorkade with other officers and staffs and students of the Institute visited the exhibition and gave their suggestions for the purchase of books. The celebration also included Hindi essay writing for the students and staffs; Hindi translation and Hindi quiz competition for the staff members of the Institute; and online essay competition was organized for the faculty members. For their special contribution in Hindi, Prof. Ganesh Ramakrishnan and the UDAAN project team; Dr. K.V.K. Raghuthaman and Staff Member of HR-2 (Human Capital Management) Section and Dr. Manju Naika, Chief Librarian and staff of Central Library were felicitated. The employees who did excellent work in Hindi were also honoured during the celebration. The winners of the competitions were awarded with certificates and cash prizes.

During the year, workshops on "Constitutional provisions for official language of the union" and "Official language policy of the Union" and "noting and drafting" etc. were organised for the Institute staff members. In addition, a workshop was also organized by Shri Jagdish Ram Pauri, Joint Director, Department of

Official Language in July 2022 for the Institute.

Regular meetings of the Official Language Implementation Committee of the Institute were conducted during the year to improve the use of Hindi in official work. 14 employees of the Institute completed their Parangat training. Thus, the total number of employees who have passed the Parangat examination from the Institute has increased to 78.

IIT Bombay published a special edition on G20 in its in-house Hindi magazine 'Kshitij'. The Dean (Strategy) Prof. K.P. Kaliappan released the magazine on March 9, 2023 in the presence of Dean (Administration Affairs) Prof. S.V. Kulkarni and the Registrar, IIT Bombay Mr. Ganesh Bhorkade. The program was coordinated by Dr. Ranjit Kumar Das, Assistant Librarian, Central Library, IIT Bombay. On the occasion, Prof. Kaliappan

congratulated the editorial board of Kshitij magazine and addressed the audience. Prof. Kulkarni delivered a lecture on G20 and related activities of the Institute. Dr. Vinod Prasad, Sr. Assistant Registrar and Editor of Kshitij G20 special edition, discussed the G20 theme in detail. The function ended with vote of thanks by Mrs. Vaishali Bahulkar, Hindi Officer.

Prof. Ganesh Ramakrishnan, Department of Computer Science and Enginering, IIT Bombay attended and gave a presentation about the Hindi Translation tool 'Udaan' at the 12th World Hindi Conference held during February 15-17, 2023 at Nadi, Fiji. IIT Bombay's Project Udaan is an end-to-end ecosystem that translates scientific and technical content from English to Hindi and all other Indian languages. The 12th World Hindi Conference was organized by the Ministry of External Affairs, Government of India in association with the Government of Fiji.

FACILITIES

INFRASTRUCTURE DEVELOPMENT

During the year 2022-23, IIT Bombay completed the construction of Type 'B' (Faculty Tower) housing 78 flats. The building is located near the main gate of IIT Bombay and has been named as 'Himadri'. The structure comprises of stilt plus 20 storeys with total built-up of 16,600 m2.

Three major projects to be constructed in the near future are as follows:

1 **Annexe to Department of Humanities and Social Sciences Building** is located between the existing building of Department of Earth Sciences and Department of Aerospace Engineering. The building (basement, G+6) will accommodate various facilities.

2 **Desai Sethi School of Entrepreneurship** building is being constructed adjacent to the Central Library building with a total built-up area of 11,300 sqm

3 **Hostel 19** with a capacity of 1052 rooms for students is being constructed behind Hostel-18. The G+9 structure will accommodate 1052 students in single or double occupancy rooms.

The architectural planning and design work for following five projects is in progress:

i **Hostel 4** is being re-constructed, parallel to the existing Hostel 18. This G+9 structure with a built up area of 34,413 sqm will accomodate 1260 students in in single or double occupancy rooms.

ii **DRDO-Industry-Academia Centre of Excellence (DIA-CoE):** This G+6 upcoming building with total built-up area 13,561 sqm is being constructed by IIT Bombay and DRDO. The building is located beyond MCGM pipeline near Research Park building. It will house labs, offices, classrooms and seminar/conference rooms.

iii **Academic Science Block 2:** This new G+10 building with a total built-up area of 10,744 sqm will house various facilities. The estimated project cost is Rs. 86.49 crores, with a major funding from IoE.

iv **Academic Block No. 1 and 2:** Stage 1 is completed. The total built-up area of this G+10 building is 35820.2 sqm.

v **New Student Activity Centre (NSAC)** is re-development of existing Open Air Theatre and Student Activity Centre.

vi **Development Centre:** This huge structure is proposed to be constructed near Padmavihar Guest House at an estimated cost of Rs. 89.97 cr.

vii **Project Evergreen:** The support of alumni has made this dream possible. Hostel 7, 8 and 21 complex (Project Evergreen) has been supported by the IIT Bombay Alumni Association (IITBAA). The total capacity of all three hostels is 1127.

During the year, the Institute had inititated revising the entire Master Plan Layout of the campus. The users were requested to submit their remarks for carrying out the revised master plan. The revised plan has been submitted to the Municipal Corporation of Greater Mumbai (MCGM) for their approval.

In addition, Institute is in process of taking up new projects like:

i Construction of New Academic Blocks (AB3 and AB4)

ii Two new hostels are proposed for 1500 students near hostel B12 – D wing.

iii Construction of Faculty Tower (B-26) of 78 flats

iv Construction of Type 2B building of 78 flats for non-teaching staff

v Construction of a new high voltage sub-station with a provision of fire safety and other essential utilities to meet the electricity demand for next 4 decades

vi Construction of Efficiency Apartments for married students of IIT Bombay.

The proposal for these projects have been submitted for the perusal and approval of the Ministry of Education.

CENTRAL LIBRARY

The Central Library is a vital component of the institute providing a wide range of services to users. In 2022-2023, the library continued to be a hub of activity, with a diverse range of services that cater to the needs of faculty, students, staff, alumni members, corporate and educational members. This annual report summarizes the library's activities for the year 2022-23.

The Central Library, IIT Bombay housed in a huge 3-storey building having central air-conditioned facilities with state-of-the-art amenities provides a vibrant ambiance to the students, faculties, staff, alumni and corporate/ member users for study, research and access to library resources. The efficient and courteous staff backs the services of the library. It holds a vast collection of books, back volume of journals, monographs, standards, reports, thesis/ dissertation and current journals/ magazines etc., in the varied areas of engineering, sciences, technology, humanities and social sciences - both in print and electronic format. The institutional repository of IIT Bombay publications attracts large number of users from around the world throughout the year.

The library continues to be a popular destination for students, researchers and other users. In 2022, the library recorded a total of around 10 lakh user footfalls. About 61, 564 books were checked out by the subsribers. The library's online catalog and library portal saw a million searches. The institutional repository of IIT Bombay has 36,247 publications. During this year, 868 Master's degree dissertations, 25 M.Phil, 442 PhD theses, and 189 Dual Degrees dissertations were submitted online on the Electronic Thesis and Dissertation (ETC) system.

The library's collections continued to expand in 2022-23, with new titles added regularly. The library provides access to more than 37,63,068 e-journals and e-resources and has added about 997 volumes including books, theses, reports, standards, pamphlets, and other reading materials during the year. It also acquired 819 e-books during the year. The entire library collection can be accessed through online-public access catalogue.

The space within the Central Library space has been redesigned to create a comfortable and environment-friendly atmosphere that is conducive to learning and collaboration.

Collaborative learning and research are becoming increasingly important in today's education system. Creating collaborative spaces, such as group-study rooms, will help to facilitate teamwork and group projects. Central Library is continuously working to redesign library space to meet the changing needs of the user community. Prof. S. Sudarshan, Deputy Director (AIA) inaugurated New 24/7 reading room of 120 seating capacity on July 7, 2022.

The Central Library also renders user-services like reference, consultation, document delivery services, book lending, arranging materials from other libraries through inter-library-loan, providing the book bank facility for IIT Bombay students belonging to economically and socially weaker sections of the society and organizing user awareness programmes to enhance their awareness about library resources, services and activities. The library allows users to self check-out books as well as renew borrowed books online. It facilitates inter-library-loan facilities of books and other informational documents for its members as and when required. It also provides internship facilities to Library Science graduates. Central Library also offers services to industry and corporate, IIT Bombay alumni and engineering (educational) institutions, professional members and has received Rs. 9,49,690 for the services rendered.

The Central Library uses open source software to manage library resources and services such as Wordpress for Library Portal, Koha for Library Automation, Omeka for Institute Archive Management, Dspace for institutional repository, and VIVO for faculty management system etc.

The library's usage statistics continue to be strong, reflecting the importance of the library to the user community. Central Library looks forward to continuing to serve the community in the years to come.

COMPUTER CENTRE

The Computer Centre continues to provide improved, efficient and effective computational network infrastructural facilities and services to the IIT Bombay user community during the year 2022-23. The academic activities including the conduct of admission tests for new students, regular classes via online sessions and final course examinations were possible using the internet facilities through various web-conferencing platforms like Cisco's WebEx, Zoom, Google Meet, Microsoft Teams etc. These were provisioned and integrated with the Light Weight Directory Access Protocol (LDAP) using a single sign-on (SSO) having Two-Factor Authentication (2FA) by the Centre. The 'IITB-SSO' app for Android and iOS provides smooth, secure and quick access to various applications integrated with the IITB-LDAP. The online course-registration for all students including new students was provisioned over the internet so that the students could complete the course registration from their respective homes at their native place over the internet. The open VPN (Virtual Private Network) services could enable students, faculty and staff easy access to various institutional computing facilities whenever they were off-campus.

Network and Connectivity

The Centre manages the campus network and is responsible for the availability of intra-campus connectivity of ~25000 wired nodes spread over all the departments, hostels, residential complexes, various entry/ exit gates on the campus boundary and internet connectivity of the Institute with the outside world. In addition, wireless access points providing wi-fi access to various departments and other key locations on campus were managed through the IITB-LDAP authentication via a radius server. The following activities were undertaken during the year:

- IIT Bombay has five backbone switches connected with a 40Gbps bandwidth.

The 32 departments, 18 hostels and six residential network kiosks possess a 10Gbps network bandwidth. Furthermore, about 200 residential buildings are connected with 1Gbps to each room.

- The intranet network at IIT Bombay is managed by OSPF routing and includes 406 routes.

- The Computer Centre at IIT Bombay will install a controller-based WiFi 6 solution for all academic and hostel networks, which will include a total of 1600 access points, both indoor and outdoor.

- The Computer Centre at IIT Bombay plans to upgrade the hostel network switches to state-of-the-art technology with new 40Gbps/ 10Gbps uplink switches. This upgrade will also include the replacement of old network distribution and access layer switches.

- The total Internet bandwidth was maintained for the campus community at 10Gbps from NKN and 7Gbps from Reliance Jio, respectively. The internet bandwidth has been upgraded from 15Gbps to 17Gbps from the previous year.

- The internet bandwidth from the above two ISPs was managed with BGP (Border Gateway Protocol) routing using appropriate router switches

- Four Class C IPv4 address ranges acquired from APNIC provide internet access to Institute's website and services

- Separate password for the users at the residences for web access was managed so that the employees do not have to share their passwords with their families

- Transport Layer Security (TLS) was procured via a digital certificate from DigiCert

- The field support team for network infrastructure provided prompt responses in restoring the reported failures of network issues to enable the smooth conduct of online classes and meetings during the hour of need

The Centre operates a network of non-academic areas, hostels and residential areas. External wi-fi access points have yet to be deployed on campus to cover common areas in student's hostels. Access through IITB-Wireless for IIT Bombay users, IITB-Guest for guests of IIT Bombay and EduRoam for visitors affiliated with EduRoam partners was managed with these wi-fi access points. The computer network set up by the Computer Centre enables the Electric Maintenance Division to monitor the Power Distribution Systems, check the status of various Lifts, functioning of UPS Systems, etc. in the Institute.

National Knowledge Network:

IIT Bombay continued to be a member of the National Knowledge Network (NKN) during the year. This multi-gigabit network initiative started by the National Informatics Centre (NIC) is being used by the Centre for Distance Engineering Education Programme (CDEEP) to conduct distance education programmes.

Grid Computing Facility GARUDA:

The grid computing facility GARUDA is also supported by the Computer Centre allowing the users of the Institute to access the available resources on the National Grid.

Honeypot server:

The National Cyber Coordination Centre (NCCC), an agency in India that is operational for cyber security and e-surveillance in the country, has deployed Honeypot servers in the Computer Centre for the detection of possible cyber threats and has started regularly reporting suspected attacks and attackers, allowing IIT Bombay to take necessary actions for protecting the IT infrastructure.

Hardware/ Software Infrastructure:

All service offerings at the Computer Centre are based on Open Source Software Systems. The Computer Centre has registered IIT Bombay as an official mirror for various versions of Linux operating systems on its anonymous FTP server (ftp://ftp.iitb.ac.in) which is available to the user community at large. To support the ERP resources of the Institute, the ERP is housed in the Computer Centre's Data Centre (DC). The Centre staff are involved in the management of the ERP hardware.

The Computer Centre has procured the DigiCert Verified Mark Certificate SSL for the domain iitb.ac. to enhance the security level for threat protection of emails for one year.

With the help of the finance available through the Higher Education Financing Agency (HEFA), a joint venture between Canara Bank and the Ministry of Education, Government of India, the Computer Centre could purchase data center hardware and accessories worth Rs. 13.4 crores to upgrade the 10-year-old server farm in the data centre. These high-end computing infrastructures consist of self-cooled racks to house the data center network switches, a 500TB storage system and 40 Enterprise servers required for providing improved email, centrally available on-premise cloud file storage of higher capacity for the users. The hardware has arrived and the work is in progress with the highest priority to migrate the existing services so that the users can access these improved services in the next few months.

To extend the Wireless (WiFi 6) network access, new wireless controller was purchased and put to use. The twenty-year-old structured cabling for computer networks in many student hostels is being upgraded in a phased manner along with new network switches using the finance under the HEFA program.

Educational software:

The Institute continues to be a member of Microsoft Azure for education software licensing programme. These licenses allow the user community to use most of the Microsoft software products in a non-production environment. Volume licenses of the latest Microsoft Office Professional (with 100 activations) have been acquired to meet critical needs of the Institute. The Institute Software Committee solicits, specifies and negotiates the purchase of useful commercially available licensed software for the IIT Bombay Academic community. Software packages meant for scientific and technical computations such as Ansys, Matlab, Labview, OriginLab, Cisco's WebEx (100 nos. host licenses for the knowledge workers) and Zoom (for education, 20 nos. of hosts) for video conferencing facility, etc. which are available through appropriate license schemes are procured, upgraded and administered by Computer Centre.

Currently floating network licenses of appropriate number of the packages like Ansys, Abaqus, Autocad, Comsol, Maple, Mathematica, SPSS, etc are also maintained at the Computer Centre. These facilities are as per the requirement of the students, faculty, scientists and staff in the Institute. The Centre also maintains and analyses the software license usages so that an optimum number of licenses could be made available to the users.

Apart from this, the online Matlab portal available through the campus-wide licenses purchased from Mathworks registers around 11,000+ users. These users have downloaded a licensed copy of the software for their computer to meet the academic and research needs. As a step towards a paperless office and fast response in searching information among the members of the respective meetings, the Institute has started using digital sessions for its important high-level conferences. This facility has enabled the members and experts of the panels to participate electronically over the web to review and finalize the conference proceedings. The Computer Centre hosts the required server and software needed for this facility.

Main Building Hardware Infrastructure:

The Computer Centre manges the desktops in various administrative sections of the Institute with more than 775 desktop machines. The Computer Centre encourages and has implemented the use of Open Source Software Systems for Office Automation in about 775 PCs deployed in the various administrative sections of the Institute. Additionally, 30 desktop PCs with Microsoft Windows operating systems (under appropriate Volume Licensing scheme), necessary antivirus software and other essential software as per requirement are also used for various administrative activities. During the year 2022-23, the Centre replaced 7 nos. of i5 all-in-one desktop computer, 11 nos. of Laptops, 26 nos. of printers and 50 Nos. of monitors for computers with new ones. The use of Open Source Operating Systems and Software has eliminated, to a great extent, the menace of the spread of computer virus and thus has optimised the IT support overheads required for network management and PC maintenance.

Word processing tools, facilities and support:

The Computer Centre provides support for Open Source Operating Systems with word processing applications (namely OpenOffice. org, LibreOffice) capable of handling various Indian Languages especially Hindi for the preparation of multilingual (bilingual) documents. The documents prepared in OpenOffice.org/ LibreOffice (available for Windows as well as Mac OS) can be saved in files compatible (edit/ save) with MS-Office.

User Awareness Sessions:

At appropriate intervals and as per requirements Computer Centre conducts a two-hour training

session on the usefulness of the applications under the Open Source Operating Systems for Office Automation and also apprises users about the IT Infrastructure facilities provided by the Computer Centre for the administrative staff of the Institute.

IP CCTV Surveillance activity of the Institute:

The Computer Centre continues to play a secondary role by providing technical support to install and run the IP-based Security Surveillance Systems having 284 IP cameras and storage for the Security Section. The Computer Centre has acquired, installed and manages 16 (nos.) IP CCTV surveillance system that vigils critical locations of the Computer Centre building. Few offices of the departments like Computer Science and Engineering, Application Software Centre, Centre for Formal Design and Verification are housed in the Computer Centre building.

High Performance Computing (HPC) Facility:

In its continued efforts to providing excellent infrastructure for cutting-edge research and the growing demand for a world-class supercomputing facility at IIT Bombay, the Centre has in operation a CRAY (recently HPE-CRAY) system for High-Performance Computing. This system is known as "SpaceTime-2" with 216 CPU (2x Intel Xeon 6148) only nodes and 64 CPU + GPU (Intel Broadwell + Nvidia P100) nodes, 1000 TeraByte parallel file system as storage. It's 1003 TFLOPS Total Peak Performance has enhanced the computing capabilities in various areas of modeling and simulation. The system is operational for the past five years and serves 1200+ users from different departments. During the COVID-19 pandemic, an incredible surge in the usage of the system was observed as it was the only research facility available and accessible remotely. In addition, a cluster consisting of 49 nodes of HPE Apollo 6000 server with a theoretical peak of 45 TF (each server has 2 X Intel Xeon 2680 v3 processors and 128 GB of RAM) and a 100 TB of parallel file system as storage and known as SpaceTime-X, continue to provide computing facilities for more than 50 users from different scientific research groups.

Telephone Exchange:

The Telephone Exchange runs about 1500 IP telephones (Voice over IP) using the computer network of the Institute. It is apart from about 3500 regular telephone lines spread over various departments, student hostels and residential buildings in the Institute. The telephone exchange has added two nos of IBS (In building solutions) for increasing the access of mobile phone and network access with a total of 10 mobile towers at various locations on campus. The telephone exchange has laid 4 kilometers of Fibre Optic Cables across campus to enhance 5G mobile networks from Airtel and Reliance Jio.

The Computer Centre runs a help-desk for all users as a part of its day- to- day activities. The twenty-year-old electronic help desk interface (web-based) has been upgraded by integrating IITB-SSO. A total of three students enrolled for the MTech program in the Department of Computer Science and Engineering actively work for the various facilities run by the Computer Centre.

The existing all-in-one desktop computers (120 nos.), data projection systems in the Bits and Bytes Lab for user access, bookings for the conduct of various courses, examinations, Institute events are maintained by the Computer Centre. The bookings for the use of the Labs and the Conference Room can be done online from the website of the Computer Centre.

DEPARTMENTS/ SCHOOLS/ INTERDISCIPLINARY GROUPS AND CENTRES

Science and Engineering Departments:

The engineering departments at IIT Bombay offer undergraduate and postgraduate programmes leading to BTech, BS, MTech and PhD degrees. The five-year Dual Degree programme pioneered by the Institute in 1996 offers a BTech degree in a basic discipline and an MTech degree with specialization in a field on its completion. This programme is now offered by all engineering departments. The science departments at IIT Bombay were set up to provide basic grounding in science and mathematics to engineering students. However, apart from providing core courses in undergraduate programmes, these departments also offer postgraduate courses which lead to MSc or PhD.

The Art and Humanities Department at IIT Bombay was set up to familiarize the students of Science and Technology studies with the broader social, cultural, economic, ethical and humane concerns underlying social change. The advanced courses offered at the postgraduate level aim at cultivating critical thinking and enhancing the analytical capabilities of students engaged exclusively with the study of these concerns. These departments offer postgraduate courses which lead to BS (Economics), MSc, BDes, MDes and PhD.

Following are the science, engineering, humanities and design departments at IIT Bombay:

Aerospace Engineering	Prof. Sudarshan Kumar
Biosciences and Bioengineering	Prof. P. V. Balaji (from 23.05.2022) Prof. Rohit Srivastava (upto 22.05.2022)
Chemical Engineering	Prof. Madhu Vinjamur
Chemistry	Prof. M. Ravikant
Civil Engineering	Prof. Deepankar Choudhury

Computer Science and Engineering	Prof. Varsha Apte (from 02.05.2022) Prof. Umesh Bellur (upto 01.05.022)
Earth Sciences	Prof. Santanu Banerjee
Economics	Prof. K. Narayanan
Electrical Engineering	Prof. Kishore Chatterjee
Energy Science and Engineering	Prof. Suneet Singh
Environmental Science and Engineering Department	Prof. Subhankar Karmakar
Humanities and Social Sciences	Prof. Kushal Deb
Mathematics	Prof. U. K. Anandavardhanan
Mechanical Engineering	Prof. Sreedhara Sheshadri
Metallurgical Engineering and Materials Science	Prof. N.N. Viswanathan
Physics	Prof. S. Uma Sankar

Schools:

Desai Sethi School of Entrepreneurship	Prof. Anuradha Narasimhan (from 18.07.2022) Prof. B. Ravi (upto 17.07.2022)
IDC School of Design	Prof. Aniruddha Joshi (from 01.08.2022) Prof. Phani Tetali (upto 31.07.2022)
Shailesh J. Mehta School of Management	Prof. S. Narayan Rao

Interdisciplinary Groups:

Climate Studies	Prof. Subimal Ghosh
Educational Technology	Prof. Sridhar Iyer
Industrial Engineering and Operations Research	Prof. Jayendran Venkateswaran
Systems and Control Engineering	Prof. Debasish Chatterjee

Centres offering academic degrees:

Some of the Centres offer postgraduate programmes and reflect the Institute's multi-disciplinary approach and emphasis on staying with leading-edge technologies in its academic approaches.

Ashank Desai Centre for Policy Studies (ADCPS)	Prof. N. C. Narayanan (from 02.06.2022) Prof. Shishir K. Jha (upto 30.05.2022)
Centre for Machine Intelligence and Data Science (C-MinDS)	Prof. Sunita Sarawagi
Centre of Studies in Resources Engineering (CSRE)	Prof. Alok Porwal
Centre for Technology Alternatives for Rural Areas (CTARA)	Prof. Anand B. Rao
Centre for Urban Science and Engineering (C-USE)	Prof. Virendra Sethi
Koita Centre for Digital Health (KCDH)	Prof. Ganesh Ramakrishnan
IIT Bombay-Monash Research Academy (Section 8 Company)	Prof. Pushpak Bhattacharyya
Centre for Research in Nanotechnology and Sciences (CRNTS)	Prof. Suparna Mukherji

Academic Advisory

Centre for Liberal Education (CLE)	Prof. Anurag Mehra

Centres of Academic Outreach (education and research)

National Centre for Mathematics (NCM)	Prof. R. Balasubramanian

Centres offering Service

Application Software Centre (ASC)	Prof. P. Sunthar
Computer Centre	Prof. Prabhu Ramachandran
Centre for Distance Engineering Education Programme	Prof. Siddhartha Ghosh (from 13.07.2022) Prof. Sridhar Iyer (upto 12.07.2022)
Parimal and Pramod Chaudhari Centre for Learning and Teaching (PPCCLT)	Prof. Sahana Murthy
Sophisticated Analytical Instrument Facility (SAIF)	Prof. Suparna Mukherji

Centres providing research and support facilities:

These Centres host a large number of sophisticated equipments and advanced facilities for carrying out R&D activities at IIT Bombay. Following are the research facilities at IIT Bombay:

Centre for Semiconductor Technologies (SemiX)	Prof. Udayan Ganguly
Centre of Excellence in Steel Technology (CoEST)	Prof. N.N. Viswanathan
Centre of Excellence in Oil, Gas and Energy (CoE-OGE)	Prof. Shireesh B. Kedare
DIA-CoE IIT Bombay (DRDO – INDUSTRY - ACADEMIA Centre of Excellence IIT Bombay) Centre of Propulsion Technology (CoPT) (previous)	Prof. Debasis Chakraborty

Centre of Excellence in Quantum Information, Computing, Science and Technology (CoE-QuICST)	Prof. Suddhasatta Mahapatra
Geospatial Information Science and Engineering (GISE)	Prof. Milind Sohoni
National Centre of Excellence in Carbon Capture and Utilization (NCoE-CCU)	Prof. Vikram Vishal
National Centre of Excellence in Technology for Internal Security (NCETIS)	Prof. B. G. Fernandes
National Centre for Photovoltaic Research and Education (NCPRE)	Prof. Suryanarayana Doolla
Wadhwani Research Centre for Bioengineering (WRCB)	Prof. Debjani Paul
Biomedical Engineering and Technology Incubation Centre (BETiC)	Prof. B. Ravi
Tata Centre for Technology and Design (TCTD)	Prof. Santosh Naronha
Technocraft Centre for Applied Artificial Intelligence (TCAAI)	Prof. Manjesh Hanawal
Water Innovation Centre: Technology, Research and Education (WICTRE)	Prof. Shobha Shukla

Sunita Sanghi Centre For Aging And Neurodegenerative Diseases (SCAN)	Prof. Samir K. Maji
Centre of Excellence on Membrane Technologies for Desalination, Brine Management, and Water Recycling (started in July 2023)	Prof. Swatantra P. Singh

Section 8 Companies

Society for Innovation and Enterpreneurship (SINE)	Prof. Santosh J. Gharpure
IIT Bombay Development and Relations Foundation	Prof. Ravindra Gudi, Dean (Alumni and Corporate Relations)
IIT Bombay Research Park Foundation	Prof. Swaroop Ganguly
Technology Innovation Hub Foundation for IoT and IoE (TIH-IoT)	Prof. Leena Vachhani

Department of Aerospace Engineering

The Department was initially established as the Department of Aeronautical Engineering during 1966-67 and was later renamed as Department of Aerospace Engineering in 1992. Three faculty members from Department have been recognized as Top 2% Scientists of the world as per a document published in 2022 by Standford University, USA. Subject-wise ranking of top 2% scientist (with their ranks) from world (all fields) include:

1. Prof. Sudarshan Kumar, HOD Rank - 2981

2. Shripad P. Mahulikar, Professor Rank - 2199

3. Prof. Rameshchandra P. Shimpi, Retired Professor Rank - 2295

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	32
No. of Post-Doc Fellows	06

Academic Programmes: The Department runs strong undergraduate and postgraduate programmes and carries out basic and applied research as well as continuing education activities in various sub-disciplines of Aerospace Engineering such as aerodynamics, propulsion, structures, dynamics and control and design. The academic programmes include the four-year BTech degree programme, the five-year Dual Degree programme, the two-year MTech programme and a PhD programme.

The Department strives for a balance of academics, research and technology
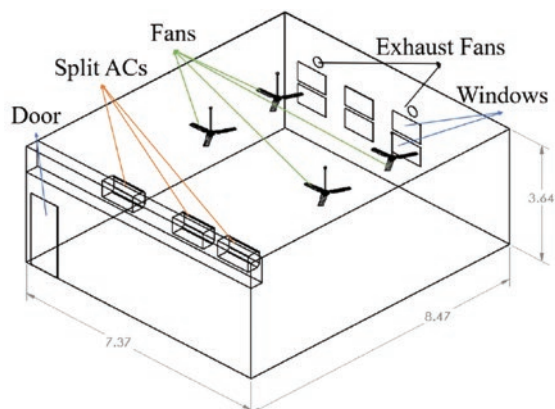
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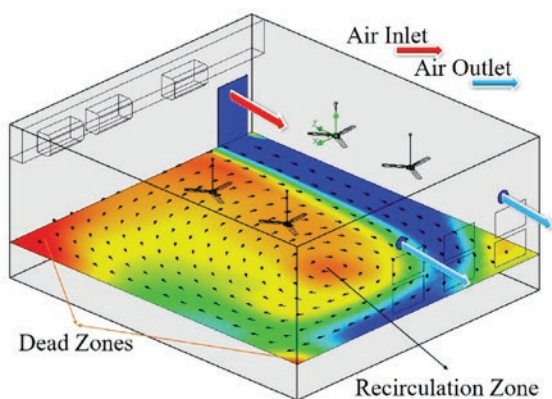
(b)

development, coupled with education beyond the classroom and co-curricular activities. The Department has MTech and PhD students from the armed forces, HAL, ISRO, DRDO and various other government and private agencies related to Aerospace Engineering. The academic programmes of the Aerospace Engineering Department focus mainly on science, engineering, and technology of flight vehicles and their sub-systems. The academic courses cover the fundamentals of fluid dynamics, propulsion, structural mechanics, vehicle dynamics, control and guidance, etc., as well as applications of these fundamentals to the analysis and design of aerospace vehicles.

Total no. of students on-roll: 610

Programmes Offered	Students Intake	Degrees Awarded
BTech	78	49
DD (BTech +MTech)	-	09
MTech	63	54
PhD	14	17
DD (MTech +PhD)	-	04
IDDDP	-	03

R&D Activities: The Department has extensive experimental and computational facilities that support its research and teaching activities. Among these are (i) the Aerodynamic Lab, which houses wind tunnels, Laser Doppler Velocity-meter (LDV), anechoic chamber (ii) Instrumentation Lab,. which has experimental set-ups for control education, in addition to sensors, actuators and other accessories as part of mechatronics related facilities (iii) Structures Lab, which has facilities for composite fabrication, testing, apart from experimental setups for demonstrating static and dynamic aspects of structures (iv) the Propulsion Lab, which houses axial flow compressor research test rig, low speed low turbulence wind tunnel, diffuser test rig centrifugal blower and motor control unit for air delivery (v) MAV Lab, which has facilities for building and flying unmanned aircraft models, hardware in loop simulation for MAVs. The Department also has powerful

serial and parallel computers, which provide computational resources for sophisticated flow simulation tasks like computational fluid dynamics and computational electromagnetics.

During the year 2022–2023, the Department has supported many students in technical activities, e.g., Mars Rover, Student Satellite, Autonomous Underwater Vehicle, Unmanned Air Vehicle, etc., and students have also been engaged in national and international competitions as participants/organizers.

Projects	Sponsored Projects	Consultancy Projects
New Projects	17	17
Ongoing	25	17
Completed	03	11

Highlights:

Ventilation of indoor spaces to tackle air pollution and air-borne infection

Last year, Prof. Krishnendu Sinha, Faculty of the Department of Aerospace Engineering, led research on the importance of indoor air quality and its impact on public health, particularly during the recent pandemic. This institute-wide initiative comprised 11 projects led by 15 faculty members from various departments, including Aerospace Engineering, Chemical Engineering, Environmental Science and Engineering, Mechanical Engineering, Electrical Engineering, Biosciences and Bioengineering and Energy Science and Engineering. The team is dedicated to comprehensively addressing this critical issue by utilizing diverse technologies and strategies to assess air quality, reduce airborne infections and combat indoor air pollution. They have identified multiple sub-projects focused on different aspects of indoor ventilation to establish an IoT-based system that integrates sensors and interventions. This system will enable continuous monitoring, control and optimization of air quality, occupant comfort and energy usage in live classrooms.

They are continuing to push the boundaries of indoor air-quality research, collaborating and leveraging technological advancements to make significant contributions to the field. Their ultimate goal is to create safe, comfortable and energy-efficient indoor spaces that prioritize the health and well-being of all occupants to make a lasting impact on the quality of the indoor environment and contribute to the betterment of society.

Figure: LT001 classroom with (a) different ventilation and air-conditioning devices, and (b) air flow circulation from CFD modelling.

Outreach/ Publicity Activities:

During the year 2022-23, the Department continued to actively engage in workshops and conferences. Some of which are as follows:

- 22nd International Symposium on Automatic Control in Aerospace 2022
- 4th National Aerospace Propulsion Conference (NAPC-2022) and workshop
- 5th National Conference on Multidisciplinary Design, Analysis, and Optimization (NCMDAO) held in hybrid mode
- Design and Engineering of Lighter-than-Air Systems: 2022 (DELTAs-2022) Conference held in hybrid mode
- Conference on Innovations in non-linear control
- Mechanics and control workshop

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	-	48	149

Department of Biosciences and Bioengineering

The Department of Biosciences and Bioengineering is a nodal centre for applying science and engineering principles to further fundamental knowledge and applications in biology and biomedical engineering. The

Department continues to nurture and sustain the ambience for the pursuit of scholarly activity in research and education, to make an international impact and produce leaders of tomorrow in the fields of Biology and Biomedical engineering.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	32
No. of Post-Doc Fellows	14

Academic Programmes: The Department currently offers MSc in Biotechnology, MTech in Biomedical Engineering and a PhD.

Total no. of students on-roll: 350

Programmes Offered	Students Intake	Degrees Awarded
MSc	35	13
MTech	26	21
DD (MSc+PhD)	-	03
DD (MTech+PhD)	-	01
MPhil (Exit)	-	01
PhD	30	17

R&D Activities: Current research and development activities are focused on basic as well as applied biosciences and bioengineering topics. The Department continues to produce impactful research as evidenced by high-quality publications, the development of technologies and products that make a difference and recognition both within and outside the country in the form of prestigious awards, fellowships of science academies, etc.

The high level of research output is ensured by excellent resources viz., technical and office staff as well as research infrastructure. The Department is well equipped with several cutting-edge facilities such as mass spectrometry, 3-D laser lithography, AFM, BSL-2 facility and FACS. This was recently augmented by the addition of an NGS facility, upright confocal laser scanning microscope (Zeiss LSM 900), analytical ultracentrifuge, SEC-MALS and ITC.

Projects	Sponsored Projects	Consultancy Projects
New Projects	20	22
Ongoing	77	20
Completed	15	-

Outreach/ Publicity Activities:

- SoSciTe [Genvision-2023], the annual event of the Department, was held during January 21-22, 2023. 11 speakers from industry and academia gave talks, with about 500 participants in attendance. Profs. Sushil Kumar and Rajesh Patkar were the convenors for this event.

- During March 15-18, 2023, the Department organised a three-day workshop on Bioanalytical Facility, providing participants with hands-on training about the working and application of bioanalytical instruments such as the Analytical Ultra Centrifuge, SEC-MALS, DSC and ITC. The workshop was funded by the Institution of Eminence (IoE), IIT Bombay, Ministry of Education, Government of India, in association with Beckman Coulter, Toshniwal Bros., and Spinco Ltd. Prof. Ashutosh Kumar was the professor-in-charge for this workshop.

- An European Molecular Biology Organization (EMBO)-sponsored workshop on 'Tumour metabolism: Current understanding and opportunities for novel drug discovery' was held during March 28-31, 2023, at Amity University, Noida, Uttar Pradesh. Prof. Sushil Kumar was co-organizer and a speaker in this workshop. https://meetings.embo.org/event/23-tumour-metabolism

- An India-EMBO Lecture Course on 'Noninvasive brain stimulation: Advances in research and clinical practice: Advances in research and clinical practice' was held at IIT Gandhinagar during December 12-17, 2022. The Lecture Course was jointly funded by EMBO and DBT/WT India Alliance. Prof. Nivethida Thirugnanasambandam was the organizer and a speaker at this event.

- Department of Biosciences and Bioengineering, IIT Bombay hosted talks

by EMBO delegation, including scientists, trainers and EMBO staff in India during the year 2022. Profs. Roop Mallik and Swapnil Shinde were convenors for this event.

Other Highlights:

Technology developed during the year:

- **Prof. Rahul Purwar and team:** CAR-T cell therapy Phase I clinical trials
- **Prof. Debjani Paul and team:** Sickle cell diagnosis technology
- **Prof Rohit Srivastaava and team:** CholSens and GlySens to AudoSens Pvt Ltd

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	02	23	06	142

Department of Chemical Engineering

The Department of Chemical Engineering at IIT Bombay started in 1958. Today, the Department is recognized as a leading Department in India, primarily because of its strong academic programmes at both undergraduate and postgraduate levels, research output, industrial collaborations and diverse range of research areas.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/Emeritus Fellow/ {Visiting-teaching faculty)	52
No. of Post-Doc Fellows	14

Academic Programmes: The Department currently offers various programmes leading to BTech, MTech, PhD and Dual Degrees and has a strong core curriculum complemented by electives in the important emerging areas at both undergraduate and postgraduate levels.

A novel course was introduced for both undergraduate and postgraduate students during the year which exposed them to open-ended problems posed by the industry. Elective courses

help students become aware of the problems faced by the chemical industry and based on these issues, they work to provide possible solutions.

Total no. of students on-roll: 1005

Programmes Offered	Students Intake	Degrees Awarded
BTech	158	100
DD(BTech+MTech)	-	09
MTech	52	36
PhD	34	31
DD (MTech+PhD)	-	02
IDDDP	-	02
PGDIIT	-	01

R&D Activities: Research is an important focus of activity and the Department has excellent faculty who lead high-quality research programmes in a wide spectrum of areas. The Department has very good experimental facilities for research and has strong links with industry interactions spanning consultancy, sponsored research and continuing education. The ChemE Tinkerer's Lab has been established with funds provided by the industry and facilitates experiential learning for the Institute's engineering students, contributing significantly to their academic and research pursuits.

The newly built lab, which focuses on energy storage and conversion systems, is now fully functional, providing a platform for research students to explore and investigate modern energy storage systems.

Projects	Sponsored Projects	Consultancy Projects
New Projects	31	15
Ongoing	73	50
Completed	14	15

Outreach/ Publicity Activities:

- AZeotropy 2023, the annual event of the Department, was organized by the undergraduate students to promote interaction between students, industry and academia. It saw participation from over 250 colleges,

more than 50 industrialists in the field and a footfall of 12000 people on average.

- Research Scholars Symposium 2023 was held with the objective of providing a platform for the PhD students in the Department to share their research work with peers and interact and network with eminent personnel from both industry and academia. The research scholars participated actively in poster presentations, oral presentations and 3-minute thesis talks. Two panel discussions were held to educate students about sustainability in chemical industry and the intersection of Artificial Intelligence (AI) and Maching Learning (ML) with chemical engineering. Several eminent researchers from various backgrounds participated in the event.

- A GIAN course titled "Optimization of Uncertain Systems: Theory and Practice" was conducted by Prof. Urmila Diwekar, University of Illinois, Chicago, USA.

- Wipro conducted a symposium on sustainability education as part of the Wipro Earthian series with participation of faculty and student organizations from various universities.

- A workshop was conducted by Prof. Bharat Kumar Suthar on electrochemical energy storage, basic of batteries and terminologies.

- A symposium on soft matter/ biophysics was conducted by Prof. Guruswamy Kumaraswamy.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	03	33	162

Department of Chemistry

The Department of Chemistry at IIT Bombay is one of the premier research and teaching hubs for chemical and chemistry-driven interdisciplinary sciences in India. The Department is well-equipped to perform cutting-edge research by virtue of central instrumental facilities of the Institute and Department as well as to the facilities built by individual faculty members. Faculty members engage extensively in outreach activities

across the country in addition to teaching and research activities. The faculty members have diverse expertise in various areas of chemistry, making it one of the best in the country and the world. About 25% of faculty members are fellows of at least one of the Science Academies of India (INSA, NASI, or IASc).

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	59
No. of Post-Doc Fellows	24

Academic Programmes: The Department offers five academic modules including Masters in Chemistry (2-year), BS in Chemistry (4-year), a (BS+MSc) dual degree, integrated (MSc+PhD) and PhD programmes. The General Chemistry programme of the Department harbours two theory and two laboratory courses in the core curriculum of the first-year BTech programme.

Total no. of students on-roll: 662

Programmes Offered	Students Intake	Degrees Awarded
BS (4-year)	42	14
MSc (2-year)	57	45
MSc (5-year)	-	02
DD (MSc + PhD)	-	05
DD (BS + MSc)	-	03
PhD	65	51
MPhil (Exit)	-	01
IDDDP	-	01

R&D Activities: Research problems of a basic, applied and interdisciplinary nature are actively pursued in the Department through sponsored and industrial research projects. Major thrust areas of research include Biophysical Chemistry, Coordination Chemistry, Bio-inorganic Chemistry, Organometallic Chemistry, Bio-organic Chemistry, Chemical Biology, Theoretical Systems Biology, Membrane Biology, Chemistry of Natural Products, Synthetic Organic Chemistry, Photochemistry and Spectroscopy, Polymer Chemistry,

Thermodynamics, Electrochemistry, Solid state Chemistry and Physics, Catalysis, Theoretical Chemistry, Statistical Mechanics and Soft Matter..

Projects	Sponsored Projects	Consultancy Projects
New Projects	31	10
Ongoing	96	17
Completed	16	06

Outreach/ Publicity Activities:

The Department witnessed many seminars, symposiums and conferences in the year 2022-23. Major ones are enumerated below:

- Prof. G.K. Trivedi Annual Award Lecture titled "The Piancatelli Rearrangement: Discovery and Application in Organic Synthesis and Drug Discovery" by Guest Speaker Dr. S. Chandrasekhar (Secretary, DST) was held on June 27, 2022

- Department of Chemistry, IIT Bombay Profs. Amber Jain, Prof. Achintya Dutta and Prof. Rahul Maitra organised the 'Mumbai Workshop on Quantum Chemistry' during July 6-11, 2022

- Summer School in Organic Chemistry (an intensive residential program for 1st-year MSc students) was held during July 8-10, 2022

- NOST Industry Academia Conclave was held on September 13, 2022. Prof. Krishna P. Kaliappan was the convenor for this conclave

- A half-day symposium on "Recent Advances in Inorganic Chemistry" was organised on October 28, 2022. HoD Prof. M. Ravikanth and Prof. D. Maiti were the organisers of this symposium.

- The International Carbohydrate Conference (CARBO-XXXVI) was held during December 5-7, 2022. Prof. Suvarn S. Kulkarni was the convener for this conference

- Yusuf Hamied Chemistry Camp was held during December 6-8, 2022. Prof. C. Subramaniam was the organiser for this Camp

- Prof. A.K. Lala Memorial Lecture 2023 titled "Technological challenges in the treatment of rare genetic diseases: Gene delivery and beyond" by speaker Prof. Sudha Bhattacharya, INSA Senior Scientist, Ashoka University, Sonipat was held on February 17, 2023

- Prof. G. K. Trivedi Annual Award Lecture 2023 titled "Strategies and Tactics in Natural Products as an Engine for Discovery" by Guest Speaker Prof. Erick M. Carreira, ETH-Zürich was held on February 21, 2023

- In House Symposium (IHS) 2023 was held on March 4, 2023. HoD Prof. M. Ravikanth , Prof. Arnab Dutta and Prof. Chidambar Kulkarni were the organisers of the event

Student Achievements:

- Ms. Diksha Rai, from Prof. Suvarn S. Kulkarni's group, has won the Rasayanam award from Dr. K. V. Rao Scientific Society

- Ms. Vasudha Sharma, from Prof. S. Maheswaran's research group, has won the best oral presentation award in Frontiers in Chemical Sciences Conference 2022

- Mr. Sukhvinder Singh, from Prof. Ruchi Anand's lab, won the poster prize at the 13th National workshop on Fluorescence and Raman spectroscopy held at IISER Trivandrum

- Ms. Asmita Sen, from Prof. G. Rajaraman's group, received the Best poster award in "Asia Pacific Conference of Theoretical and Computational Chemistry (APATCC 10)"

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	03	-	271

⬆ *60th Convocation of the Department held on August 20, 2022*

Department of Civil Engineering

The Department of Civil Engineering has been a part of IIT Bombay since its inception in 1958. Over the years, the Department has grown tremendously and is now recognized as one of the best engineering departments in the country, ranking high in the world for Civil Engineering. It has developed strong links with the building and construction industry and academia at national and international levels. With its multifaceted faculty, it provides technical advisory support through various R&D projects and consultancy to infrastructural industry, academic and research institutions. Eight faculty members of the Department are featured in the Top 2% Scientists of the world list in 2022, as published by Stanford University, USA, in collaboration with Elsevier. The Department of Civil Engineering, IIT Bombay, retains the first position in India in the QS Ranking 2023 in the domain of Civil and Structural Engineering and a World Ranking of 53 (in a bracket of 51-100).

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	60
No. of Post-Doc Fellows	13

Academic Programmes: The Department offers BTech, MTech and PhD programmes. The undergraduate students also have the opportunity to convert into a dual degree (BTech + MTech) programme in the available specialisations.

Total no. of students on-roll: 1090

Programmes Offered	Students Intake	Degrees Awarded
BTech	171	96
MTech	80	58
DD (BTech+MTech)	-	06
PhD	53	30
DD (MTech+PhD)	-	04
IDDDP	-	03
PGDIIT	-	06

R&D Activities: Besides high quality teaching and instruction at both undergraduate and postgraduate levels, the Department is actively involved in basic and applied research and consultancy and provides high-quality technical advisory support through various R&D projects and consultancy to various organizations.

The Department has excellent facilities for carrying out teaching, research and consultancy activities, including Structural Engineering Laboratories, Experimental Mechanics Laboratory Heavy Structures Laboratory, Structural Safety, Risk and Reliability Laboratory, Structural Health Monitoring and Retrofitting Laboratory.

The following new state-of-the-art equipment were installed in the Department labs:

⬆ *Blast simulator at the Shock and Impact Dynamic Lab (SIDL)*

⬆ *High precision real-time kinetic survey system*

⬆ *Industry level 3D concrete printer*

Projects	Sponsored Projects	Consultancy Projects
New Projects	24	554
Ongoing	59	614
Completed	15	440

Outreach/ Publicity Activities:

- Workshop on Characterisation of Asphalt Binder/ Bitumen at IIT Bombay in May 2022, convened by Prof. Dharamveer Singh.

- CDRI-British Council-University College London-IIT Bombay workshop on Disaster Resilient Infrastructure Education in June 2022.

- 1st Indo-German Exchange on Road and Pavements (IGERP), Core Member, Coordinator Group, (Online) joint workshop between Indian and German universities in June 2022. Prof. Dharamveer Singh, IIT Bombay and Prof. Animesh Das, IIT Kanpur, were the conveners.

- Recent Research Trends in Ocean Engineering, Science and Technology in September 2022, convened by Prof. Balaji Ramakrishnan.

- National Workshop on Geotechnics for Heavy Urban Infrastructure, held during October 1-2, 2022. Prof. Dasaka S. Murty and Prof. Ashish Juneja were the organizers.

- Workshop on Testing of Deep Foundations held during November 9-10, 2022. Prof. Dasaka S. Murty and Prof. Ashish Juneja were the organizers.

- The 14th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC) was held during December 19-21, 2022, at IIT Bombay. The conference was chaired by Prof. Dharamveer Singh and Prof. Avijit Maji was the secretary.

- Technology Vision 2047 Brian Storming Session held during February 6-7, 2023, convened by Prof. D. N. Singh.

- A workshop on heat wave was organized in partnership with the National Disaster Management Authority and Maharashtra State Disaster Management Authority and IIT Bombay during February 13-14, 2023 and was convened by Prof. Ravi Sinha.

- The "1st PhD Connect Conclave 2023" was held on March 11, 2023. Prof. Deepankar Choudhury, Prof. Swathy Manohar, Prof. Albert Thomas and Prof. Srineash V. K. were the organizers of this conclave.

- The 15th edition of Aakaar, the annual technical fest of IIT Bombay Civil Engineering Department, was held during March 18-19, 2023. Prof. Deepankar Choudhury, Prof. Swathy Manohar, Prof. Albert Thomas and Prof. Srineash V. K. were the organizers of this conclave.

- Workshop on "Scientific Writing by Springer" on March 24, 2023. Prof. Deepankar Choudhury and Prof. Swathy Manohar were the organizers.

- International SHARP workshop on CCUS on March 27, 2023, convened by Prof. D. N. Singh.

- IIT Bombay and DAE workshop convened by Prof. Manish Kumar.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	04	19	118	315

Department of Computer Science and Engineering

The Department of Computer Science and Engineering is one of the largest departments in India, renowned for its research and academic programmes.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	49
No. of Post-Doc Fellows	02

Academic Programmes: The Department offers a Bachelor of Technology (BTech), a Master of Technology (MTech), a (BTech+MTech) Dual Degree and a PhD programme.

Total no. of students on-roll: 1075

Programmes Offered	Students Intake	Degrees Awarded
BTech	174	129
MTech	89	125
PhD	21	11
DD (BTech + MTech)	-	01
MS by Research	22	02
PGDIIT (Exit)	-	01

R&D Activities: The Department conducts research and teaching spanning a broad spectrum of areas, including algorithms, combinatorial optimization, graph theory, cryptography, formal methods, verification, theoretical computer science, graphics, image processing and analysis, computer vision, information retrieval, artificial intelligence, machine learning, reinforcement learning, natural language processing, speech processing, medical image computing, functional programming, embedded systems, compilers, mobile computing, object-oriented systems, parallel and distributed processing, programming languages, databases, query processing and optimization, real-time systems, security, software engineering, cloud computing and virtualization, performance analysis and wireless networks.

Projects	Sponsored Projects	Consultancy Projects
New Projects	16	14
Ongoing	78	26
Completed	09	08

Student Achievements:

- Pratik Kalshetti, a PhD Student of Prof. Parag Chaudhuri won second place in ACM Student Research competition at SIGGRAPH 2022
- Dr. Vrunda Dave, (a PhD student of Prof. S. Krishna) has been chosen as a runner-up for the Beth Outstanding Dissertation Prize (BODP) 2022
- Indradyumna Roy, first-year PhD student working on Representation Learning for Scalable and Multimodal Graph Retrieval (co-advisors Prof. Abir De and Prof. Soumen Chakrabarti) has been awarded the prestigious Prime Minister Research Fellowship for the year 2022
- Nihar Ranjan Sahoo, a second-year PhD student working on Bias Detection on Data and Model (advisor Prof. Pushpak Bhattacharyya) has been awarded the prestigious Prime Minister Research Fellowship for the year 2022

Highlights:

The IIT Bombay Trust Lab was inaugurated on September 15, 2022, headed by Prof. Manoj Prabhakaran, the Vijay and Sita Vashee Chair Professor at IIT Bombay. The Lab will drive several activities in research, education, development, outreach and entrepreneurship to leverage IIT Bombay's expertise in security, privacy and digital trust.

Outreach/ Publicity Activities:

During the year 2022-23, the Department held various conferences and workshops including:

Conferences:

- CODS-COMAD 2023 Conference
- e-Yantra Regional Conference 2023 at Coimbatore and Pune

Workshops:

- Technical session on Model Based Design Approach for Embedded Systems
- 2-day workshop on Embeded Systems
- Technical session "Fusion 360"
- NSDI GISE Hub Conclave
- 2 days eYIC workshop on breaking barriers
- Jensen's GTC Keynote
- A Deep Dive into DPU Computing: Addressing HPC/AI Performance Bottlenecks
- Technical session on Introduction to Image Processing using OpenCV
- Technical session on Introduction to Robot Operating System
- Technical session on Basics of Self Balancing Robot
- IIT Bombay CSE Research Symposium
- Technical session on Introduction to IoT
- ACM Winter School
- Trust Summit 2022

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	-	141	55

Department of Earth Sciences

Academic programmes in Earth Sciences began when a section in the Department of Civil Engineering was established in 1959. As this educational programme flourished, the team grew to become a separate Department of Earth Sciences in 1982 and has been able to leave its mark as one of the major academic units contributing to the Earth Sciences. The Department of Earth Sciences strives to be a centre of excellence in teaching and research in the field of Earth Sciences. It has been working towards this goal by hiring the best faculty to create sophisticated analytical and experimental laboratories and periodically restructuring the courses to incorporate emerging areas of the Earth Sciences into the syllabus. The Department aims to establish links with various institutes within India and abroad that address similar challenges.

The Department's mission is to be a globalized institution that would enable interactions among researchers, offer educational programmes, encourage faculty and student exchanges and help the country grow. The Department is interdisciplinary and hosts multifaceted faculty engaged in high-quality teaching and research.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	24
No. of Post-Doc Fellows	10

Academic Programmes: The Department offers Masters programmes leading to MSc (Applied Geology), MSc (Applied Geophysics), MTech (Geo-exploration), MTech (Petroleum Geoscience) and Doctoral degrees. Over the last twenty-five years, more than 1800 students have graduated from the Department. The Department is recognized as one of the best departments in the country in terms of teaching, research and placements. All the core, additional and elective courses included in the programmes have been designed to meet industry standards and research requirements.

Total no. of students on-roll: 238

Programmes Offered	Students Intake	Degrees Awarded
MSc (2-year)	38	31
MTech	18	28
PhD	13	17
PGDIIT	-	11

R&D Activities: The Department is actively involved in basic and applied research and consultancy providing high-quality technical advisory support through various R&D projects and consulancy to multiple organizations. The Department supports well-equipped laboratories that aids in teaching and research activities.

Projects	Sponsored Projects	Consultancy Projects
New Projects	08	17
Ongoing	26	20
Completed	06	03

New Research Equipments:

- Established a multi-parameter Geophysical observatory facility (INR 1 Cr) with Broadband Seismograph, GNSS with Antenna and HPC.

- Electrical Properties system at Overburden conditions (EPS 700)
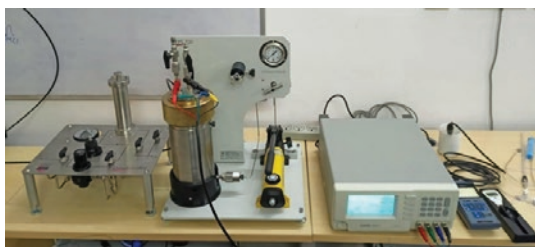
- Real Time Kinematic Global Positioning System (Trimble)

- Laser Raman Spectroscopy Lab housing Raman Spectrometer with required accessories and sample preparation set-up. Two 1.5 tom AC for 24/ 7 maintaining temperature and humidity.

- Fluid and Melt Inclusion Lab Housing Fluid and Melt inclusion heating freezing stages and three petrological microscopes with two of them mounted with stages. This is also space for research student offices.

- Laser Raman Spectrometer with integrated imaging station. There are two solid state laser systems (532 nm and 785 nm) available with a spectral resolution 1 cm-^{1} (FWHM) with spectral range of 50 to 3500 cm-^{1}. And a spatial resolution of 0.1 $\square$m.

- Linkam THMSG 600 Heating Freezing stage and Linkam TS1500 Heating for fluid inclusions study with attached camera and software to measure and record the temperatures in the range of -196 to 600°C and 25 to 1500°C, respectively.
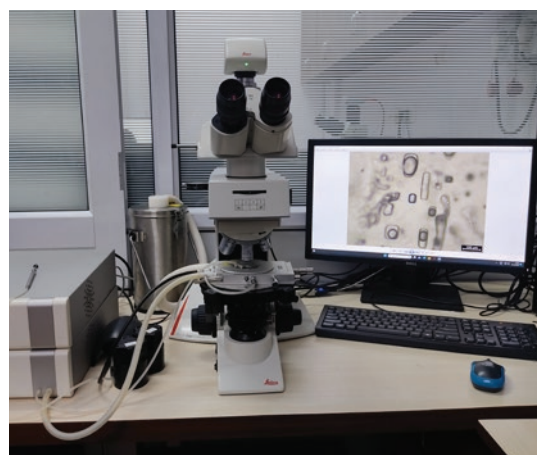
- Portable Magnetometer and VLF Receiver System along with GPS

Projects	Sponsored Projects	Consultancy Projects
New Projects	08	17
Ongoing	26	20
Completed	06	03

Outreach/ Publicity Activities

- The National Centre of Excellence in Carbon Capture and Utilization (NCoE-CCU), Department of Earth Sciences, IIT Bombay, hosted several capacity-building workshops, continuing education programmes and short courses, including those for the executives of NTPC, the executives of ONGC, the international student community Society for Material Chemistry etc., and participated in delivering lecture series for the alumni courses and that for the Directorate of Technical Education, Govt. of Maharashtra. The International Energy Agency, France, also conducted a joint international workshop with participation from key stakeholders.
- Distinguished Lecture entitled "Magmatism vis-à-vis deformation and metamorphism in the Himalayas" at the Wadia Institute of Himalayan Geology, Dehradun, in online mode on August 26, 2022.
- National Seminar on Machine Learning and Deep Learning Applications in Geosciences, held during April 1-2, 2023.
- Online Brainstorming Session conducted on Landslides and Human Environment: A New Approach to the Study of Fault-related Hazards in Himalayan Townson on behalf of the PAMC, Geosciences, Ministry of Earth Sciences on February 12, 2023.
- A workshop and Brainstorming Session on Critical Minerals Research for Sustainable Transition to Green Energy were held during March 3-4, 2023.
- NCoE-CCU engaged as a Knowledge Partner and Advisor to ONGC and NTPC, including those in the 2023 CCUS Seminar under India's G20 Presidency led by the Ministry of Power. NCoE-CCU contributed to the CCUS policy frameworks and their deployment mechanism in India, published by NITI Aayog in November 2022. NCoE-CCU was a key member in writing the draft 2030 Roadmap for CCUS in upstream exploration and production companies, released by the Ministry of Petroleum and Natural Gas.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	04	41	69

Department of Economics

The Institute announced the launch of its new Economics Department with 13 faculty members across varied specializations on January 16, 2023. The Department was established as economics as a discipline grew in importance. The objective is to be ahead of the latest developments in the field, produce high-quality research and graduate well-trained students. Cutting-edge research conducted in the Department will also help enhance policy-making for the government and government bodies and enhance decision-making

for businesses. The new Department will give focussed identity to faculties and students while applying for research grants, internships, exchange programs and higher studies. Several of its PhD alumni are serving as faculty members in other IITs, NITs and other prestigious organisations.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	13
No. of Post-Doc Fellows	-

Academic Programmes: The economics group already had launched a four-year BS (economics) degree programme in 2017. The Department of Economics currently offers a PhD programme and plans to offer a Minor specialisation in economics for the undergraduate students of the Institute in the future.

The Department seeks to promote a holistic science and technology education that attends to economic policies and societal concerns through the inclusion of a core course in economics and its contribution to sensitise students to environmental concerns through another core course.

Total no. of students on-roll: 141

Programmes Offered	Students Intake	Degrees Awarded
BS (Economics)	35	28

R&D Activities: The Department faculties are involved in a number of research projects independently, as well as in collaboration with faculty members from other departments of IIT Bombay and as part of international research networks and partnerships. Faculty members and student researchers of the department carry out research in several cutting-edge areas and disciplines as well as interdisciplinary themes such as Climate Studies, Digital Health, Education Technology, Policy Studies and Urban Science and Engineering. Some of the faculty are Associate faculty members in these academic units of the Institute.

Projects	Sponsored Projects	Consultancy Projects
New Projects	02	-
Ongoing	03	02
Completed	-	03

Outreach/ Publicity Activities:
During the year 2022-23, the Department organized various seminars, webinars and conference, including:

- Econometrics
- Access to Clean Water and the Role of Information and Transaction Costs: Field Experimental Evidence from India
- Environment Sustainability
- Evaluating Rare Event Predictions
- Cash transfers for child development: Experimental evidence from India
- Decentralizing the Development-Conservation Trade-off: Evidence from Forestland Diversions in India
- Health and Labour
- Land Redistribution and Violence - Evidence from West Bengal
- The Long-Term Effect of Improving Early-Life Learning Preparedness on Cognitive Abilities
- Processed Foods, Socio-economic Status and Peri-urban Obesity in India
- Frequent Decision Shortcuts Breed Costly and Persistent Inattention: Evidence from Taxi Drivers
- Conference titled 'The Asian Meeting of the Econometric Society (AMES), 2023'

Other Highlights:

- Institute Chair (Economics) Professor Haripriya Gundimeda led the report on the economic value of Sanjay Gandhi National Park's ecosystem services, which was released by Government of Maharashtra in September 2022.
- Prof. K. Narayanan led a team of 8 faculty members cutting across various academic

disciplines and 14 research scholars in Climate Studies to prepare a State Action Plan on Climate Change for the state of Rajasthan. The report was submitted in June 2022.

https://environment.rajasthan.gov.in/content/environment/en/environmental-information-system/State_Action_Plan.html

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	03	04	15

⬆ *Various stakeholders from institutions and industry leaders during the Asian Meeting of the Econometric Society (AMES), 2023 Conference hosted by Department of Economics, IIT Bombay*

Department of Electrical Engineering

The Department of Electrical Engineering has grown immensely from its inception in 1958 to now, where it has become one of the major departments at IIT Bombay. The Departmental goals for 2022–23 are centered around the old and new curriculum as well as continuing to build professional systems that enable excellent research. Faculty actively peruse research in the areas of Communications and Signal Processing, Control and Computing, Power Electronics and Power Systems, Solid State Devices, Electronic Circuits and VLSI Circuits and Systems.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	78
No. of Post-Doc Fellows	16

Academic Programmes: The Department began with three programmes, namely, Bachelor of Technology (BTech), Master of Technology

(MTech) and Doctor of Philosophy (PhD). Since 1996, the Department has been offering a five-year Dual Degree (BTech+MTech) with specializations in Communications and Signal Processing and Microelectronics.

Total no. of students on-roll: 1626

Programmes Offered	Students Intake	Degrees Awarded
BTech	105	72
DD (BTech+MTech)	89	56
MTech	142	138
DD (MTech+PhD)	-	04
PhD	41	39
MS by Research	-	01
PGDIIT (Exit)	-	01
IDDDP	-	05

R&D Activities: Over the last two decades, the Department has developed a strong collaboration with industry, resulting in the establishment of

several laboratories. The Department has around 30 well-equipped 24X7 research laboratories, enriched with all modern equipment and software, including state-of-the-art research laboratories and centres such as the Centre for Excellence in Nanoelectronics, the National Centre for Photovoltaic Research and Education and the Telecom Centre of Excellence, to name a few. The Department plays a tremendous role in driving the country's technology roadmap in the electronics sector and emphasises good technical education through theory courses, teaching laboratories, CEP courses, workshops and conferences. The facilities in the Department are among the best in India and in certain specialized areas, they compete with those of leading International universities.

Projects	Sponsored Projects	Consultancy Projects
New Projects	29	29
Ongoing	121	54
Completed	22	20

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	-	105	143

Department of Energy Science and Engineering

The Department of Energy Science and Engineering is a unique blend of science and engineering faculty working on developing sustainable energy systems and solutions for the future.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	27
No. of Post-Doc Fellows	05

Academic Programmes: The Department offers (BTech+MTech) dual degree programme, the (MSc+PhD) dual degree programme, the MTech programme in Energy Systems Engineering, a PhD programme and a Minor in Energy Engineering programme.

Total no. of students on-roll: 486

Programmes Offered	Students Intake	Degrees Awarded
BTech	47	02
MTech	30	18
PhD	17	15
DD (BTech+MTech)	-	24
DD (MSc+PhD)	21	05
DD (MTech+PhD)	-	02
MSc (Exit)	-	04
PGDIIT (Exit)	-	03
MS by Research	-	03
IDDDP	-	02

R&D Activities: The Department's research areas include renewable (solar PV and thermal, wind and biomass); thermal and electrochemical storage systems; power systems and power electronics; energy integration; energy efficiency and nuclear energy. Some of the major ongoing initiatives are the National Centre for Photovoltaic Research and Education (NCPRE), the Indo-UK Clean Energy Research Centre, the DST-IIT Bombay Energy Storage Platform on Hydrogen and the interdisciplinary Centre of Excellence in Oil, Gas and Energy with support from the Indian public sector companies (IOCL, ONGC, HPCL, BPCL, GAIL, OIL and EIL), Sustainable Energy Storage suitable for Microgrid (SENSUM) funded by DST, Development of Compressed Hydrogen -Fuel Cell Integrated System Suitable for Light Duty Vehicles.

Projects	Sponsored Projects	Consultancy Projects
New Projects	06	11
Ongoing	40	21
Completed	06	09

Outreach/ Publicity Activities:

- Workshop on Energy Education Outreach 2023 held during March 20-21, 2023. Profs. Srinivas Seethamraju and Sankara Sarma V Tatiparti were the organisers of the event.

- 8th International Conference on Advances in Energy Research (ICAER 2022) held virtually during July 7-9, 2022. Mr. Dinesh Dayanand Jagdale, Joint Secretary, Ministry of New and Renewable Energy, Government of India, New Delhi was the Chief Guest. Prof. Zakir H. Rather, Prof. Suryanarayana Doolla were the conveners of the event. The event focussed on developing sustainable energy systems, solutions and workforce for the future.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	04	23	83

Environmental Science and Engineering Department

The Environmental Science and Engineering Department (ESED) was established in 1985 as a Centre and got the status of "Department" in February 2019. The graduates of this Department have career opportunities as engineers and scientists in Environmental Quality and Pollution Control. This programme offers course work and research opportunities leading to masters and doctoral degrees and ultimately enables the graduates to contribute to the solution of current and future environmental problems. The Department offers a minor in Environmental Science and Engineering for undergraduate students from other departments at IIT Bombay. ESED also offers an Institute core course, "Environmental Studies: Science and Engineering," to all undergraduate and (MSc+PhD) students. Besides, the Department offers several elective courses for sensitizing students across all disciplines towards the urgent need. The Department has faculty members with multi-disciplinary backgrounds and diverse research interests.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	16
No. of Post-Doc Fellows	02

Academic Programmes: ESED offers academic programmes in (BTech+MTech) and (MSc+PhD) Dual Degrees, an MTech and a PhD, with a strong focus on teaching and research. The Department's main goal is to train students to conduct innovative research and development for the society. Graduate research projects combine careful fundamental study with recognition of the practical and technological importance of the research.

Total no. of students on-roll: 319

Programmes Offered	Students Intake	Degrees Awarded
DD (BTech+MTech)	49	-
MTech	25	14
PhD	20	03
DD (MSc+PhD)	10	04
DD (MTech+PhD)	-	01
MSc (Exit)	-	02
PGDIIT (Exit)	-	02

R&D Activities: Major ongoing research deals with contemporary topics such as (a) clean technologies and industrial pollution prevention (b) integrated treatment and disposal of hazardous waste (c) bio-medical waste management (d) biodegradation of complex industrial wastewater (fertilizer, food, paper, coke oven, diary, distillery, petrochemicals) and wastewater containing halogenated aromatics, nitro-aromatics and other mixed substrates (e) biodegradation of complex non-aqueous liquid pollutants (NAPLs, e.g., oil and tar) (f) development and application of toxicity/ mutagenicity tests for emissions and effluents (g) development of novel bioreactors (RBC, UASB) (h) air pollution monitoring, modeling and human health risk analysis (i) aerosol and PAH emission factors, aerosol inventory, transport modeling and source apportionment (j) environmental impact assessment of developmental projects (k) in-situ and ex-situ remediation of contaminated groundwater and aquatic environments (l) environmental systems simulation and optimization (m) risk, frequency and vulnerability assessment to natural/ environmental hazards and (n) analysis and mapping of hydroclimatic extremes and

flood modeling. Research projects are currently funded by agencies such as the Department of Biotechnology (DBT), the Department of Science and Technology (DST), the Ministry of Education (MoE) (earlier known as MHRD), the All India Council for Technical Education (AICTE), the Ministry of Water Resources (MoWR), the Ministry Of Earth Sciences (MoES), the Ministry of Environment, Forest and Climate Change (MoEFCC), the Central Pollution Control Board (CPCB), the Delhi Pollution Control Committee (DPCC), the Maharashtra Pollution Control Board (MPCB), the Telangana State Pollution Control Board (TSPCB), the Municipal Corporation of Greater Mumbai (MCGM) and the Multinational enterprises (MNEs).

The research activities of ESED are supported by excellent experimental and computational facilities. The Department offers wide professional expertise and actively pursues sponsored research, consultancy and technical services. ESED is also very active in human resources development and regularly organises tailor-made workshops and training programmes. Thus, the Department has established strong links with leading industries, institutions and national/ international agencies.

Projects	Sponsored Projects	Consultancy Projects
New Projects	05	20
Ongoing	23	27
Completed	06	05

Outreach/ Publicity Activities:

- A workshop on "Antimicrobial Resistance (AMR) in the Environment" was jointly organized by Departments of Biosciences and Bioengineering and Environmental Science and Engineering, IIT Bombay as a part of the Indo-UK AMSPARE project held in January 2023. Prof. S. Mukherjee was the convener of the workshop.
- Prof. Harish Phuleria participated in a symposium at the joint conference (hybrid) of

the International Society for Environmental Epidemiology Asia and Western Pacific Chapter (ISEE-AWPC) and the International Society for Exposure Science Asia Chapter (ISES-AC), held in June 2022 in Singapore.

- ESED, IIT Bombay organized an essay writing competition for students of 9th and 10th standard from KV Powai School and Campus School on occasion of International Day of Clean Air for Blue Skies observed on September 7, 2022.
- Prof. Abhishek Chakraborty was a committee member in the National Clean Air Programme (NCAP) for Thane Municipal Corporation representing IIT Bombay as Institute of Repute (IoR) under the National Clean Air Programme (NCAP), a Ministry of Environment, Forest and Climate Change (MoEFCC), Govt. of India initiative.
- Prof. Abhishek Chakraborty was a member of the city-level Technical Advisory Committee (TAC) constituted by BMC to tackle the growing air pollution menace in Mumbai city.
- Deepakshi Babbar, a PhD student, has received the Prime Minister's Research Fellowship 2023.
- Saumya Yadav, an MSc+PhD student, won the best poster award at the Climate Action Now 2022-2023 segment III workshop organised by the Indian Institute of Technology Gandhinagar. She showcased her research on the dilemma of diets and climate in India.
- Mufaddal Moni, a Dual Degree student, has received ISIAQ Student Travel Award 2023.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	02	22	54	66

Department of Humanities and Social Sciences

The Department of Humanities and Social Sciences at IIT Bombay was set up to familiarize the students of Science and Technology studies with the broader social, cultural, economic, ethical and humane concerns underlying social change. The advanced courses offered at the postgraduate level aim at cultivating critical thinking and enhancing the analytical capabilities of students engaged exclusively with the study of these concerns. These departments offer postgraduate courses which lead to MSc and PhD.

The Department of Humanities and Social Sciences (HSS) houses the disciplines of English Literature, Linguistics, Philosophy, Psychology, Sociology, CISTS (Sanskrit) and History. The Department plans to incorporate other disciplines like Political Science in the near future.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	40
No. of Post-Doc Fellows	05

Academic Programmes: The Department offers an MA+PhD programme in Philosophy and a PhD programme in all of disciplines currently constituting it. From autumn semester of 2022, the Department has launched an MA by Research programme in Sociology/ Language, Literature and Performance Studies/ Human Sciences.

Total no. of students on-roll: 374

Programmes Offered	Students Intake	Degrees Awarded
MPhil	-	18
MA Research	15	-
DD (MA+PhD) (in Philosophy)	10	-
DD (MPhil+ PhD)	-	03
MA (Exit)	-	04
PhD	34	21

The Department, apart from the production and dissemination of its disciplinary concerns, plays a unique and distinctive role within the vision of the Institute, which seeks to promote a holistic science and technology education. The inclusion of the study of the Humanities and other Social and Behavioural Sciences ensures that our quest within the frontiers of science and technology takes place in an informed manner and attends to humanitarian and social concerns. Towards this end, the Department offers a number of core and elective courses for the BTech, MTech and the MBA pogrammes of the Institute.

Apart from the facilities made available to all students at the Institute-level and at the Department-level, the students have access to the resources available in the Computer Labs. The Department also has Psychology Laboratories.

R&D Activities: The Department faculties are involved in a number of research projects independently, in collaboration with faculty members from other Departments of IIT Bombay and as part of international research networks and partnerships. Faculty members and student researchers of the Department conduct research in several cutting-edge areas and emerging sub disciplines as well as trans-disciplinary themes such as computational linguistics, climate studies, organizational justice, digital media, innovation, gender and environmental change.

Projects	Sponsored Projects	Consultancy Projects
New Projects	03	03
Ongoing	10	05
Completed	04	01

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	02	09	-	13

Department of Mathematics

The Department of Mathematics conducts basic, applied and interdisciplinary research in varied areas of Mathematics, including Algebra and Number Theory; Analysis; Geometry and

Topology; Combinatorics and Theoretical Computer Science; Partial Differential Equations; Numerical Analysis; and Probability and Statistics.

The main focus is to explore recent avenues in mathematics and prepare young minds to do innovative research independently and collectively.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	51
No. of Post-Doc Fellows	10

Academic Programmes: The Department offers Masters programmes in Mathematics [MSc (MA)] and Applied Statistics and Informatics [MSc (ASI)], an integrated MSc programme, a (MSc+PhD) dual degree programme and a PhD programme.

The Department launched the 'Bachelor of Science (BS) in Mathematics' during the academic year 2018-19. The curriculum also includes basic science courses and incorporates elective courses from the science, engineering and humanities disciplines, allowing considerable flexibility and academic freedom. There are minor programmes for undergraduates offered in both Mathematics and Statistics, and in an integrated MSc programme in addition to the core undergraduate curriculum. The Department is also involved in teaching Mathematics-related courses in the BTech programme of the Institute.

Total no. of students on-roll: 331

Programmes Offered	Students Intake	Degrees Awarded
BS	26	07
MSc (MA)	38	21
MSc (ASI)	48	34
MSc (5-year)	-	04
MPhil (Exit)	-	04
MSc (Exit)	-	01
PhD	12	10

R&D Activities: The Department retained its focus on fundamental research while engaging in a wide range of applied and interdisciplinary research. Members of the Department are actively involved in both domestic and international collaborative ventures with corporate and governmental organisations, including in the strategic and developmental sectors.

Projects	Sponsored Projects	Consultancy Projects
New Projects	02	01
Ongoing	22	-
Completed	04	-

Outreach/ Publicity Activities:

During the year 2022-23, the Department held various workshops and conferences including:

- Workshop on Young Harmonic Analysts Meeting during January 26-28, 2023. Prof. Sanjoy Pusti was the organizer of this workshop.

- Conference on Functional Analysis and Related Topics-2023 during February 21-25, 2023. Prof. Bata Krishna Das and Prof. Mayukh Mukherjee were the conveners for this conference.

- Workshop on Control Theory meets Theory of Homogenization during February 28-March 4, 2023. Dr. Harsha Hutridurga and Dr. Debanjana Mitra were the organizers of this workshop.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	-	03	35

Department of Mechanical Engineering

The Department of Mechanical Engineering is one of the largest departments at IIT Bombay. In addition to teaching and research, the Department is proud to have its faculty serve in various capacities to ensure the smooth functioning of the Institute. In the 2023 edition of the QS World University Rankings by Subject, IIT Bombay was ranked 68 under the "Engineering - Mechanical, Aeronautical and Manufacturing" programme category.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	64
No. of Post-Doc Fellows	22

Academic Programmes: The Department offers the undergraduate BTech degree and has a postgraduate programme awarding MTech and PhD degrees. The postgraduate programme offers specializations in the areas of thermal and fluid engineering, design engineering and manufacturing engineering. Dual degrees, which confer a combined (BTech + MTech) and (MTech + PhD), are options which students can avail to accelerate their career advancement. Now, students can pursue MTech minor in any of the three specializations, i.e., Thermal, Design and Manufacturing.

Total no. of students on-roll: 1461

Programmes Offered	Students Intake	Degrees Awarded
BTech	176	114
MTech	112	52
PhD	42	34
DD (BTech+MTech)	26	33
DD (MTech+PhD)	-	02
PGDIIT (Exit)	-	03
MS by Research	-	01
IDDDP	-	03

R&D Activities: The Department continues to evolve with the ever-increasing challenges in technology development while maintaining a strong base in the fundamental aspects of Mechanical Engineering. While much of today's research in Mechanical Engineering is of an interdisciplinary nature, the research work of the faculty members of the Department is categorized into three broad streams: Thermal and Fluids Engineering, Design Engineering and Manufacturing Engineering. The Department provides a rich learning environment for students along as well as solutions for challenging industrial problems and for social cause through rigorous methodology of research and development.

Projects	Sponsored Projects	Consultancy Projects
New Projects	33	32
Ongoing	98	55
Completed	14	17

Outreach/ Publicity Activities:

- FOSSEE event "Introduction to OpenFOAM and CFD", a multi-university webinar convened by Prof. Janani Srree Murallidharan

- NSM Workshop on High Performance Computing (HPC) for Computational Fluid Dynamics (CFD) Applications. Prof. Shivasubramanian Gopalakrishnan was the professor-in-charge for this workshop

- Digital Twin Workshop for the Indian Navy convened by Prof. M. S. Kulkarni

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	04	51	187

Department of Metallurgical Engineering and Materials Science

The Department of Metallurgical Engineering and Materials Science continues to excel in a wide variety of areas, ranging from classical metallurgy, especially steel, which is of great importance to the country, to non-metallic materials in various forms and dimensional scales for applications ranging from advanced structural components to electronic, optical, sensing, healthcare and energy harvesting/ conversion/ storage devices.

Over the last 4-5 years, the number of PhD student intake has more than doubled. The Department of Metallurgical Engineering and Materials Science (MEMS) has been ranked second in

the country and at 101 in the world as per QS World University Rankings by Subject for 2023.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	49
No. of Post-Doc Fellows	25

Academic Programmes: The Department continues to design and offer new courses pertinent to cutting-edge areas. The Department offers a four-year BTech programme, a five-year Dual Degree (BTech + MTech) programme, an MTech programme and a PhD programme. The critical strength of the IIT Bombay MEMS Department lies in its ability to balance teaching and research, traditional and emerging materials and applied and basic research. The Department strives for excellence in manpower development.

The Department has also been offering an MTech in Steel Technology for personnel from steel industries, which has been very effective in enhancing the technical capabilities of manpower in major steel industries. The classical teaching combined with short-term courses (continuing education and quality improvement programmes, special training programmes like GIAN and SERB Schools, etc.) has generated an excellent pool of highly motivated and competent manpower for the country. Some of the PhD students of the Department are also successful towards receiving highly renowned international awards due to their excellence in research.

Total no. of students on-roll: 970

Programmes Offered	Students Intake	Degrees Awarded
BTech	145	79
MTech	70	56
DD (BTech+MTech)	-	21
PhD	37	23
DD (MTech+PhD)	-	02
IDDDP	-	06

R&D Activities: There has been a significant contribution from some of the focused research programmes. These include programmes under CoEST (Centre for Excellence in Steel Technology, funded by the Ministry of Steel), providing a platform for critical research collaborations for the Indian Steel Industry, several technological products and a wide range of sponsored research projects.

The Department has started a long-term technical engagement with JSW Steel and has also signed an MoU with them to create a building infrastructure for the JSW-Technology Hub (JSW-TH) for Steel Manufacturing. The CoEST and JSW-TH steels are playing a significant role in the decarbonization efforts of steel plants mandated by the Ministry of Steel, Government of India. JSW Steel has also provided funding towards establishing a Sajjan Jindal Chair Professor at the Department.

Another relatively new collaborative Centre funded by the Department of Science and Technology is the Water Innovation Centre: Technology, Research and Education (WICTRE), which focuses on a very important area, especially considering the present needs of our country.

Projects	Sponsored Projects	Consultancy Projects
New Projects	17	15
Ongoing	66	38
Completed	17	11

Outreach/ Publicity Activities:

- IOE-funded Metals and Materials Industry Summit conducted by students. Prof. Tanushree Choudhury was the convener for this Summit.

- A two-day workshop on Research Proposal Writing convened by Prof. Tanushree Choudhury.

- The Science and Technology of Ironmaking and Steelmaking (STIS-2022) Conference was held during December 13-16, 2022. Prof. N. N. Viswanthan was the convener and Prof. Somnath Basu, Prof. Manish M. Pande and

Prof. Deepoo Kumar were the co-conveners for this conference

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	01	08	272

Department of Physics

The Department of Physics at IIT Bombay started functioning in 1959 and is now one of the largest departments in the Institute. The Department has a tradition of vibrant teaching and offers many research topics making it one of the most preferred destinations for students at all levels. The faculty members of the Department are playing a leading role in establishing a Centre for Quantum Computing at IIT Bombay. An important role of this Centre is to offer an IDDDP programme in quantum computing. Its faculty conduct cutting-edge research in diverse areas.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	48
No. of Post-Doc Fellows	30

Academic Programmes: The Department offers a two-year MSc in Physics programme, a four-year BTech in Engineering Physics and a PhD Programme. A new course called "Fundamental themes in Physics" was made available by the Department to first-year BTech students. The "Electronics" and "Optics" teaching laboratories have been fully refurbished with new equipment. The "Makerspace" lab was set up by Prof. Varun Bhalerao for the 1400 UG first-year students.

Total no. of students on-roll: 556

Programmes Offered	Students Intake	Degrees Awarded
BTech	57	42
DD (BTech+ MTech)	-	07
MSc	60	32
DD (MSc+ PhD)	-	04
PhD	33	22
MPhil (Exit)	-	01
MSc (Exit)	-	02

R&D Activities: The Department's research is organised into thrust areas that are pushing the frontiers of understanding of space and time and of matter and energy in all their forms. The research spans condensed matter physics, photonics, nuclear and elementary particle physics, string theory and cosmology. The establishment of state-of-the-art experimental and computational facilities has allowed us to venture into emergent interdisciplinary areas like nanotechnology, quantum information processing, nonlinear dynamics and biophysics. With a vibrant and active PhD programme, the Department thrives to be one of the leading research institutes in the world.

The research effort in the Quantum Information theory area greatly increased over the previous year. Two brand-new, cutting-edge research labs are being set up in the Department. One is the Electron Beam Lithography (EBL) lab by Prof. Suddasatta Mahapatra and Prof. Kantimay Dasgupta and the other is the Field Sweep Nuclear Magnetic Resonance lab by Prof. Avinash Mahajan. An initiative for satellite-based astronomy called Daksha was proposed by Prof. Varun Bhalerao.

Projects	Sponsored Projects	Consultancy Projects
New Projects	11	-
Ongoing	52	03
Completed	06	-

Outreach/ Publicity Activities:

- The International Conference on Smart Materials for Sustainable Technology II was held during October 13-16, 2022, at IIT Bombay, convened by Prof. Sunita Srivastava.

- The IIT Bombay-ICTP School on Stochastic Thermodynamics in Biology was held during November 28–December 2, 2022, at IIT Bombay and was convened by Prof. Mithun Mitra.

- The Ph.D. Student Symposium 2023 was held during January 28-29, 2023, and was convened by Prof. Sai Vinjanampathy.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	10	18	145

Schools

Desai Sethi School of Entrepreneurship

The Desai Sethi School of Entrepreneurship (DSSE) was set up as a centre in 2014 with a generous donation from alumnus Mr. Bharat Desai to foster innovation and entrepreneurship. It grew to become the School of Entrepreneurship in 2019. DSSE trains aspiring entrepreneurs through education and pre-incubation programmes.

In the last eight years, over 3000 students have benefited from Entrepreneurship courses; over 750 students have embarked on their entrepreneurial journeys; 200+ venture teams have been mentored in the pre-incubation programme; and DSSE students have gone on to lead 60 startups in multiple domains: consumer, enterprise tech, logistics, fintech, edtech, cleantech etc.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	09
No. of Post-Doc Fellows	-

Academic Programmes: The Desai Sethi School of Entrepreneurship (DSSE) offers several theory and lab courses relevant to innovation and entrepreneurship, open to undergraduate and postgraduate (Masters and PhD) students. Students can take these courses as electives from the second year onwards or pursue a BTech (Minor) in Entrepreneurship as an additional degree, provided they complete a minimum of 30 credits. The interactive and experiential pedagogy of these courses is based on class discussions, field assignments and team projects, guest entrepreneurs and case studies. DSSE runs a Proof-of-Concept lab providing the necessary tools and guidance for students to work on design and prototyping of their product ideas. In 2022, DSSE offered ENT101, Introduction to Innovation and Entrepreneurship, along with IDC School of Design to expose students in their early years to entrepreneurial skillsets and mindset.

R&D Activities: In 2022, the Accelerating Technology Commercialization Programme was offered to researchers in a sponsored project by RGSTC (Rajiv Gandhi Science and Technology Commission), Government of Maharashtra. The workshop sessions included Technology Package Development, Intellectual Property, New Product Development, Finance and Go-to-Market.

Projects	Sponsored Projects	Consultancy Projects
New Projects	-	-
Ongoing	01	-
Completed	-	-

Other Highlights:

- In 2022, the IDEAS programme added three new cohorts with 45 teams participating and one Women in Entrepreneurship cohort with six participants. DSSE held workshops for these cohorts on Women As Changemakers, Impact Assessment and How To Be Investor Ready.

- On September 18, 2022, DSSE celebrated Mentors' Day (Hybrid) by felicitating its mentors, including alumni and those who guided aspiring venture teams, for their invaluable contributions. Close to 70 entrepreneurs and mentors attended the conference.

- In September 2022, Prof. Anuradha, Head of DSSE, was felicitated by IIT Bombay as an

achiever-alumna in the initiative IIT Bombay Gen Zero Women.

- Two 3-day workshops on Accelerating Technology Commercialization for researchers and faculty members of Maharashtra colleges sponsored by the Rajiv Gandhi Science and Technology Commission were held in October 2022 and March 2023. In each of these workshops, Prof. B. Ravi and Prof. Nishant Tikekar trained more than 25 participants on translating and commercializing academic research.

- The ground-breaking ceremony of the new DSSE building next to the Central Library was held on December 1, 2022.

- DSSE held a hybrid Entrepreneurship Symposium at Victor Menezes Convention Centre, IIT Bombay, on January 31, 2023, attended by over 150 participants. Prof. Meric Gertler, President, University of Toronto, was the Chief Guest and keynote speaker on the occasion. IIT Bombay's Distinguished Alumnus Mr. Bharat Desai, whose contributions and support helped set up DSSE, joined the symposium virtually for a fireside chat. The event also hosted two panel discussions on the evolving role of entrepreneurship education and academic incubators, as well as fostering entrepreneurship education from research to impact. The panelists comprised a mix of illustrious faculty from national and international technology institutes (RNIT Melbourne, IIT Delhi and IIT Madras), leadership from tech startups and DSSE faculty, amongst others.

- A workshop on Entrepreneurship was conducted by Prof. Devdip Purkayastha for all Institute Technical Council (ITC) student members in January 2023. Three of the IDEAS Pre-incubation teams were invited by TechConnect to exhibit their ideas and products at Techfest in December 2022.

- Eminent speakers invited for guest lectures included Mr. Rizwan Koita, Co-Founder, Citius Tech; Mr. Bharat Desai, Co-Founder, Syntel; Mr. Milind Kopikare, VP, Great Learning; Mr. Shantanu Rastogi, MD, General Atlantic; Mr. Salil Donde, CEO, Ventiv Tech; Mr. Anirvan Chatterjee, Co-Founder, Haystack Analytics etc.

⏶ *Director Prof. Subhasis Chaudhuri felicitating Prof. Meric Gertler at DSSE's Entrepreneurship Symposium*

⏶ *Ground-breaking ceremony of the new DSSE Building held on December 1, 2022*

⏶ *Padma Vibhushan Dr. Anil Kakodkar, IIT Bombay's Dean (Strategy) Prof. K.P. Kaliappan and other delegates during Accelerating Technology Commercialization programme held in October 2022*

⬆ *Entrepreneurs and Mentors at DSSE Mentors' Day Celebrations held in September 2022*

⬆ *Mr. Rizwan Koita, Co-Founder of Citius Tech, during a guest lecture on Entrepreneurship*

IDC School of Design

The IDC School of Design (IDCSoD) at IIT Bombay offers an excellent environment for academics, research and applications in the field of design. The School interacts with industries and institutions for promotion and awareness of design. These are in the form of seminars, short-term courses and workshops. In the area of design practice, IDCSoD offers professional design consultancy and advisory services to industries and other organizations. The potential for innovation at IDCSoD lies fundamentally in solving real-world problems.

IDC School of Design envisions a holistic design education that shapes students into responsible contributors to society. It enables them to identify significant contemporary problems, inculcate critical thinking, critique conventional solutions and challenge the status quo to arrive at creative solutions through collaborative team efforts at different levels of society and influence policymaking that leads to innovations.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	56
No. of Post-Doc Fellows	-

Academic Programmes: The IDC School of Design at IIT Bombay has a well-established Master of Design degree (MDes) programme in Industrial Design, Communication Design, Animation Design, Interaction Design, Mobility and Vehicle Design and minor courses, as well as a PhD programme in Design. From the year 2015 onwards, IDCSoD has started a four-year, eight-semester Bachelor of Design (BDes) programme and (BDes+MDes) dual degree is a five-year, ten-semester course, which is available only at the end of the third year. Both of these programmes are credit-based and thus offer the flexibility to progress at one's own pace.

Total no. of students on-roll: 362

Programmes Offered	Students Intake	Degrees Awarded
BDes	37	16
MDes	73	55
DD (BDes+MDes)	-	07
PhD	12	02

R&D Activities: Several kinds of projects are undertaken at IDC, including product-oriented, experimental research, open-ended exploratory research projects, theoretical research and documentation and pedagogic research. Many of

these projects are sponsored by the industry, the ministry and other organizations. The students conduct many projects of varying duration and complexity as part of their academic programme.

Projects	Sponsored Projects	Consultancy Projects
New Projects	03	04
Ongoing	10	12
Completed	04	06

Outreach/ Publicity Activities:

- Pre-PhD Symposium and Post-PhD Consortium, convened by Prof. Jayesh Pillai and Prof. Anirudha Joshi

- Workshop on Design Doctoral Consortium, convened by Prof. Jayesh Pillai and Prof. Anirudha Joshi

- Symposium on Namaste HCI, convened by Prof. Anirudha Joshi

- International Conference on Design Education, convened by Prof. Purba Joshi and Prof. Mandar Rane, held during September 1-3, 2022

- Typography Day 2022 was held during November 18-19, 2022, with support from the India Design Association (InDeAs) and Aksharaya. Workshops on Typography and Calligraphy, followed by a conference dedicated to 'Typography for Children' was conducted. Select posters from the Poster Design Competition were also exhibited.

- Workshops on
  - Towards meaning and expression
  - Typography
  - Thematic Calligraphy
  - Design Workshop Week

Student Achievement:

Khyati Priya, a PhD scholar, has been selected for the prestigious Prime Minister's Research Fellowship (PMRF) for conducting her PhD research on "Affordances in shape-changing interfaces."

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	03	02	51	08

Shailesh J. Mehta School of Management

The Shailesh J. Mehta School of Management (SJMSOM) has occupied its distinct place in the globe as an Institute of excellence in Management, Education and Research. The year 2022-23 was marked by further strengthening and consolidation of the academic programmes of the School. The School offers postgraduate programmes in new, emerging areas and aims to expand the scope of the academic programmes in the Institute.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	28
No. of Post-Doc Fellows	-

Academic Programmes: The School of Management offers Doctoral programme (PhD) in Management, 2-year full-time Master of Business Administration (MBA), BTech (Minor) in management, Executive MBA (E-MBA) jointly with Olin Business School, Washington University in St. Louis USA, certificate programmes, short and long duration in-house and open management development programmes for the corporate executives/ professionals of all areas.

New elective courses introduced during the academic year 2022-23

- Managing Industry 4.0 in enterprise
- Introduction to Management
- Disaster Risk Financing
- Entrepreneurship as Practice
- Quantitative and Algorithmic Trading
- Econometrics of Financial Markets
- Economics of Distribution and Discrimination

Total no. of students on-roll: 430

Programmes Offered	Students Intake	Degrees Awarded
MBA	117	115
EMBA	39	06
PhD	09	08

R&D Activities: Faculty members of the School are engaged in many research and consulting projects in all areas of management, including applied research in rural development, climate change and other interdisciplinary areas. An 'NSE Cogencis Finance Lab' set up at the School, with the assistance of NSE Cogencis to install 5 Cogencis workstations on a pro bono basis, marks an important milestone in enhancing the finance research ecosystem of SJMSOM.

Projects	Sponsored Projects	Consultancy Projects
New Projects	02	02
Ongoing	06	06
Completed	-	-

Highlights:

The School hosted the 4th International Conference on Financial Markets and Corporate Finance. Prof. S. N. Rao, Prof. Varadraj Bapat and Prof. Piyush Pandey were the conveners of this conference.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	-	28	40

Interdisciplinary Groups

Interdisciplinary Programme in Climate Studies

The Interdisciplinary Programme in Climate Studies (IDPCS) [under the project, Department of Science and Technology-sponsored Centre of Excellence in Climate Studies (DST-CoECS)] was initiated at IIT Bombay in January 2012 as one of the first doctoral programmes in India addressing research related to climate change. Faculty from various departments across IIT Bombay are associated with IDPCS, who apply a depth of expertise in their fields to address the complexity of climate change. They apply their expertise to interdisciplinary problems related to climate that cross traditional academic boundaries. Their contributions include traditional core climate and environmental sciences, interdisciplinary technology development, climate-economics and social sciences.

The objectives are to build long-term scientific capacity for studying regional climate change and climate futures, enabling the creation of a pool of multidisciplinary researchers to serve the growing needs for climate change scientists and professionals to serve the R&D and policy needs in private, public and governmental institutions. IDPCS has successfully provided critical assessments to support policy and governmental decision making in air and water resources; climate mitigation; and adaptation measures.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	04
No. of Post-Doc Fellows	-

Academic Programmes: The doctoral curriculum in the IDP in Climate Studies includes core courses in two broad tracks of climate science and climate policy, supplemented by elective courses on a broad range of theoretical and practical topics. IDPCS has began the Interdisciplinary Dual Degree Programme (IDDDP) in Climate Science and Policy for undergraduate students.

Total no. of students on-roll: 66

Programmes Offered	Students Intake	Degrees Awarded
PhD	09	10

R&D Activities: Ongoing research at IDPCS cuts across the domains of climate science, vulnerability and adaptation and mitigation and policy. Investigations address improvement of model physics related to clouds, ocean mixing, aerosol processes, climate change detection and attribution, climate change impacts on cities and communities, adaptation and mitigation responses and the assessment of climate change policies and mechanisms. Research efforts are being propelled not only towards statistical downscaling but also in understanding the feedback from regional perturbations to synoptic scale circulations. A socio-ecological systems perspective is being designed to integrate pollution impacts, climate change-related risks and hazards and anthropogenic environmental degradation to yield a contextual vulnerability assessment that can impact local-level policy and decision-making. Also, the positive/ negative impacts of climate and environmental policies on coastal vulnerability are being assessed. "Transformation" theory, conceptualization and operationalization of "emergent groups" for flood risk governance and integration of climate change uncertainties into adaptation strategies, constitute the three key innovations that are being used to convert climate change knowledge into local-level adaptation and policy for flood risk mitigation. Detection, attribution analysis and modelling of hydroclimatic extremes are being studied. The dynamics of the equatorial Indian Ocean are being studied using Modular Ocean Model. Decision support systems are being developed for studying technology options for sectors contributing to climate change by including technology attributes related to cost, life cycle impacts, technology readiness level and social acceptability.

Outreach/ Publicity Activities:

Workshops

- A workshop on 'Writing Science for Non-Scientists' was organised in collaboration with Research Matters, an online science magazine and a venture of Gubbi Labs, during November 22-24, 2022. Prof. S. Ravichandran was the convener of the workshop.

- A workshop on TUFLOW, convened by Prof. Subimal Ghosh.

- A national roundtable workshop on 'Pathways To Transformation: Coastal, Delta and Desert Communities', convened by Prof. D. Parthasarathy.

- A workshop on 'Thermodynamics of the Earth System' by Prof. Axel Kleidon and Prof. Vinod Gaur convened by Prof. Subimal Ghosh.

- India Meteorological Department (IMD) Pune-IIT Bombay workshop on Climate Services convened by Prof. Subimal Ghosh.

- An interactive session with Prof. Anuradha Narasimhan and Prof. Auroop Ganguly on Climate Entrepreneurship convened by Prof. Subimal Ghosh.

Student Achievements:

- PhD student Sindhuja Kasthala received the Berkner Fellowship worth $2500 to participate in the 2022 American Geophysical Union (AGU) Fall Meeting held during December 12-16, 2022.

- Girish Patidar spent two months in France (Toulouse and Montpellier) under the DST-CNRS project, working with Dr. Stephane Calmant, Dr. Adrien Paris and Dr. Hind OUBANAS on the potential of the SWOT mission for the Mahanadi river basin.

- PhD student Srinath Haran Iyer has received a consolation prize for his paper titled *'Comparison of different coal power plants in India retrofitted with calcium looping based CCS system'* at the 8th International Conference on Advances in Energy Research 2022 Conference.

- PhD student Manish Kumar Dhasmana, a student of Prof. Arpita Mondal, won the AGU

Precipitation Student Award.

- Prof. Phuleria's PhD student Navinya Chimurkar received the European Geosciences Union (EGU) Early Career Scientist's Travel Support. He presented *"Understanding Climate Impact and Indoor Emission Nexus: Size Resolved Exfiltration Factor"* in #EGU23.

- PhD student Nandini Suresh has been selected as a 2023 Asian Development Bank (ADB) Intern. She would be working on *"Categorizing climate change policies in developing Asia"* under the Economic Research and Regional Cooperation Department. She works with Prof. Trupti Mishra.

- PhD student Navinya Chimurkar was selected for the prestigious Fulbright-Kalam Climate Doctoral Fellowship 2023-2024 by the United States-India Educational Foundation. He works with Profs. Harish Phuleria and Chandra Venkataraman on carbonaceous aerosols, emission inventory and particle optics. With the Fullbright Kalam fellowship, he will be working on understanding the climate impact of sectorally distinct optical information of the brown carbon and preparing a mitigation plan for India.

- PhD student Tannu Kaushik was selected for the prestigious Prime Minister's Research Fellowship. He works with Profs. Arnab Dutta and Vikram Vishal at IIT Bombay.

- PhD student Taveen Kapoor's work was featured on the Elsevier Environment *'Journal of Aerosol Science'* cover of the November 2022 edition.

- PhD student Vikas Kumar's flash talk presentation, "Ensemble Machine Learning Approach for PM2.5 Reconstruction Using MERRA-2 and Long-term Analysis for India (1980-2021)" was selected for Health and Air Quality Applied Sciences Team Meeting at Wiscons held in October'22. https://youtu.be/ovRpARiRpKo

Other Highlights:

- Prof. Indu J. was invited by NASA Jet Propulsion Laboratory (NASA JPL) for a talk and to witness the launch of SWOT satellite from Vandenberg

Space Force Base and represented IIT Bombay and India.

- Prof. Sridhar Balasubramanian (IDPCS-associated faculty from Department of Mechanical Engineering) co-founded 'WeatherCast', a weather tech start-up, incorporated in May 2022 and incubated at Society for Innovation and Entrepreneurship (SINE), Indian Institute of Technology (IIT) Bombay and the Centre for Innovation Incubation and Entrepreneurship (CIIE), Indian Institute of Management (IIM) Ahmedabad. It focuses on developing a tech-driven hybrid model for offering reliable and intelligent weather and microclimate services by blending meteorology, fluid dynamics, machine intelligence, data analytics and environmental engineering. It aims to provide precise short-range forecasts, impact-based forecasts and weather warnings. Using expert analysis tools, the start-up provides customized solutions, which would help plan operations, thereby preventing damage and losses. **Website:** https://www.weathercast.in/ **Twitter:** https://twitter.com/WeatherCastIN

- Prof. Pradip Kalbar (IDPCS-associated faculty from CUSE) and his team commissioned their new low-cost water supply intervention, 'Manifold,' in Dongaria region near Kolkata.

- The first initiative in 'Climate Services' by team of IDPCS professors for farmers in Satara district.

▲ *(From R-L) Prof. Pennan Chinnasamy with Mr. Avinash Mishra (Niti Aayog, Adviser Water and Land Resources), Ms. Lea Wermelin (Danish Minister for Environment), Hon'ble Jal Sakthi Minister Mr. Gajendra Singh Shekhawat, Mr. Flemming Møller Mortensen (Danish Minister for Development and Nordic Cooperation), Mr. Ashok (Director, Namami Gange Programme) and Ms. Pooja Kapur (Indian Ambassdor for Denmark) during the whitepaper launch at the @IWAHQ Water Congress 2022 in Denmark*

• IDPCS celebrated its 10th anniversary on May 2, 2022. Dr. M. Ravichandran, Secretary, Ministry of Earth Sciences (MoES), was the Chief Guest. IDPCS released a brochure on its anniversary. On the occasion, IIT Bombay also signed an agreement with the India Meteorological Department, Pune, for developing user-friendly weather forecasting applications and to contribute significantly to the global fight against climate change. The entire ceremony video can be viewed on the IDPCS official YouTube channel: IDPCS 10th Anniversary Celebrations Inaugural Ceremony | 2nd May 2022

▲ *(From L-R) Prof. Milind Atrey, Dean (Research and Development) IIT Bombay (sitting) and Mr. K. S. Hosalikar, Head (IMD Pune) (sitting) along with Prof. Subimal Ghosh (Convener, Climate Studies and Professor, Department of*

Civil Engineering, IIT Bombay), Special Guests Dr. Nisha Mendiratta (DST), Dr. Akhilesh Gupta (Secretary, SERB), Director of IIT Bombay Subhasis Chaudhuri and Chief Guest Dr. M. Ravichandran (Secretary, Ministry of Earth Sciences, GoI) during signing of MoU on May 2, 2022

▲ *Dr. Akhilesh Gupta presented the award to IDPCS alumni Dr. Kushal Tibrewal and Dr. Arushi Sharma, who won the Centre's logo competition for designing the decadal anniversary logo on May 2, 2022*

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	02	-	40

Educational Technology

The Interdisciplinary Programme in Educational Technology (IDP-ET) started in the Institute in 2010-11. The IDP-ET conducts research in areas of pedagogies and tools for technology-enhanced learning. In addition to Institute courses for PhD and MTech, the IDP-ET organizes short-term courses and Massive Open Online Courses (MOOCs) on effective teaching-learning with emerging technologies and educational research methods through Continuing Education Programme (CEP), National Programme on Technology Enhanced Learning (NPTEL) and IITBombayX. The

faculty members, post-doctoral research scholars and PhD students of the IDP-ET play a significant role in the organization of international conferences, carrying out government and industry-sponsored projects and providing consultancy.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	06
No. of Post-Doc Fellows	01

Academic Programmes: The group offers a PhD and MTech programme in Educational Technology. The IDP-ET continues to offer core courses and electives in various topics in educational technology. These courses have had enrolment from BTech, MTech and PhD students in other academic programmes within the Institute. A new course 'Educational Text Data Analysis (ET - 622)' has been added to the curriculum in 2022-23.

Total no. of students on-roll: 55

Programmes Offered	Students Intake	Degrees Awarded
MTech	02	05
PhD	05	01

R&D Activities: The main research areas of focus of the IDP-ET are as follows:

- **Technology-Enhanced Learning of Disciplinary Practices (TELeaD):** TeLeaD focuses on developing students' cognitive skills such as design thinking, problem-posing, estimation, algorithmic thinking, modelling, data representation and analysis and divergent-convergent thinking.

- **Teacher Use of Educational Technology (TUET):** TUET focuses on research-informed development and outreach of ideas and innovations to empower teachers to use educational technology effectively.

- **Educational Data Analytics (EDA):** Educational Data Analytics is an emerging field where data pertaining to student behaviour in

a computer-mediated environment are used to analyse cognitive and affective states.

- **Exploration of Emerging Technologies for Education (EmergE):** Identify potential benefits that emerging technologies such as augmented reality, virtual reality, wearable devices etc., might afford in the teaching-learning process and design appropriate learning activities using such technologies.

New equipment purchased:

- Pupil Core Eye-Tracker

- Interactive touch table for collaborative learning

Projects	Sponsored Projects	Consultancy Projects
New Projects	-	-
Ongoing	05	01
Completed	02	-

Outreach/ Publicity Activities:

The Centre organized various outreach activities including:

- Prof. Sahana Murthy convened following two workshops:

1. Workshop on 'Sensitization of EdTech Tools and Strategies' organized for Kotak Education Foundation (KEF) employees and teachers from schools affiliated with KEF on November 8, 2022.

2. Workshop on 'Logical Thinking and Emerging Educational Technologies' organized for students of Grades 6-8 from municipal schools in Mumbai on February 27, 2023.

- The faculty and alumni of the EdTech Group officially launched the *EdTech Society* in April 2022 to improve instruction and learning through the use of educational technologies in India.

- *EdTech* Tulna, a quality evaluation framework, has been used in two state government procurement tenders. The IDP in Educational Technology, in partnership with the Central Square Foundation, has created the framework.

- IIT Bombay and the Naval Institute of Educational and Training Technology

(NIETT) Kochi signed an MoU on July 15, 2022, to focus on collaborative R&D activities and outreach between Educational Technology, IIT Bombay and NIETT.

- Anthony Prakash, a PhD student, was selected for the IEEE Technical Community on Learning Technology (TCLT) Student Award 2022.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	02	28	06

⬆ *Outreach workshop on Emerging Technologies held for school students*

Industrial Engineering and Operations Research

Industrial Engineering and Operations Research (IEOR) was established as one of the first interdisciplinary programmes at IIT Bombay in 1976. IEOR has a depth and breadth of capability that makes the programme unique in the country. The discipline offers a blend of theory, modelling and application, drawing from traditional as well as modern areas of operations research, together with a system view derived from long-standing principles of industrial engineering. IEOR contributes significantly to achieving the goals through various activities such as offering academic programmes, conducting continuing education programmes (CEP) and carrying out research projects of different types. It also has a very vibrant alumni group.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	10
No. of Post-Doc Fellows	01

Academic Programmes: IEOR offers PhD, MTech, (MSc+PhD) dual degrees and IDDDP. IEOR also offers a UG Minor. IEOR offers a range of courses in the areas of optimization, stochastic models, simulation, statistics, machine learning, artificial intelligence, deep learning, supply chain, logistics, operations, service systems etc. Also, the IEOR curriculum includes computational labs that train students on various modelling and software tools that can help implement operations research theory and algorithms to solve practical problems.

Total no. of students on-roll: 141

Programmes Offered	Students Intake	Degrees Awarded
PhD	07	01
DD (MSc+PhD)	16	01
MTech	32	25
MSc (Exit)	-	12
MS by Research	-	01
PGDIIT (Exit)	-	01

R&D Activities: The core areas of research include theoretical and computational optimisation, convex optimisation, probabilistic and stochastic models, data analytics, machine learning, reinforcement learning, deep learning, Markov decision processes, queueing theory, simulation modelling and analysis, system dynamics methodology, optimal control, game theory and networks, mathematical finance, logistics and transportation, railway operations and supply chain analysis. Faculty members served as referees for several journals and international conferences. IEOR has hosted several visitors from academia and industry during 2022-23. Faculty members visited various universities to pursue joint research.

Projects	Sponsored Projects	Consultancy Projects
New Projects	03	-
Ongoing	07	-
Completed	02	-

Outreach/ Publicity Activities:

- A one-day workshop on Games and Networks was held on July 11, 2022, at IIT Bombay, convened by Prof. K. S. Malikarjuna Rao.

- A one-day workshop on Games on Empirical research on corruption - Challenges and new practices and Stochastic Choice was held on December 6, 2022, at IIT Bombay and was convened by Prof. K. S. Malikarjuna Rao.

Student Activities:

Several PhD students presented their research publications at national and international conferences and won awards for their work, including:

- IEOR research scholar Divya Jyoti Bajpai was awarded the prestigious PMRF fellowship.

- Manoj Kumar (a doctoral student at IEOR, IIT Bombay) and Anoop K. P. (a post-doctoral fellow at IEOR, IIT Bombay) won the *Commendable Paper Award* for their co-authored paper titled *"An innovative modelling framework for freight consolidation in transportation planning"* at the Ninth International Conference on Business Analytics and Intelligence (BAICONF2022) held at IIM Bangalore (IIMB) during December 15-17, 2022.

- Debamita Ghosh was awarded *Best Graduate Forum Presentation-Runner Up* for her paper titled *"Fixed Budget Beam Identification in Millimeter Wave Systems via Unimodal Bandits,"* co-authored with Prof. Manjesh Kr. Hanawal, at the 15th International Conference on COMmunication Systems and NETworks (COMSNETS), held at Graduate Forum in Bangalore during January 3-8, 2023.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	-	16	10

⬆ *The IEOR graduates of 2020 and 2021 batch during the reunion Convocation ceremony hosted by IIT Bombay on August 6, 2022*

⬆ *Participants and faculty during the workshop on Games held at IIT Bomay*

Systems and Control Engineering

The Systems and Control Group, formed in 1977, is a unique interdisciplinary programme in the country. Many of the alumni of the group hold senior positions in the control and automation industry and research laboratories in the country.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	16
No. of Post-Doc Fellows	02

Academic Programmes: The Group offers postgraduate programmes in MTech and PhD in the broad area of Systems and Control.

Total no. of students on-roll: 79

Programmes Offered	Students Intake	Degrees Awarded
MTech	21	11
PhD	05	07

R&D Activities: The research focus of the core group is in the areas of nonlinear control, robotics, path-planning, embedded control, coordination of autonomous vehicles, multi-agent systems, sliding mode control and applications, fractional-order modelling and control, optimization and optimization-based control, stochastic processes, game theory, stochastic control, optimization, economics, information theory and combinatorial coding theory, control theory, NMR spectroscopy, nonlinear and geometric control, quantum information and control. In addition, research in the areas of process control, identification, behavioural theory, matrix computation and automotive control is being pursued by the associate faculty members.

The experimental lab at Systems and Control is geared towards introducing students to hardware and software that implement control theories learnt as part of coursework. A variety of setups based on mechanical, electrical and chemical principles are made available to the students for this purpose. As part of core coursework, all Masters' students are expected to understand modelling, communication, sensor calibration and control of hardware to accomplish different control objectives.

Prof. Vivek Natarajan recently developed a new research facility, the "Continuum Dynamics and Control Laboratory". Experimental setups are being constructed in this lab to showcase control algorithms created for flexible structures.

Projects	Sponsored Projects	Consultancy Projects
New Projects	04	03
Ongoing	15	03
Completed	02	04

Outreach/ Publicity Activities:

- Prof. Leena Vachhani participated in TechConnect and other exhibitions for the demonstration of a spherical robot, an autonomous underwater vehicle and the social impact of Agro-IoT (through TIH).

- The paper titled *"Geometric Second-Order Laplacian Flow for Consensus on Lie Groups"*, by Rama Seshan (IIT Madras), Prof. Ravi N. Banavar (IIT Bombay) and Arun D. Mahindrakar (IIT Madras) has been chosen as one the three best student papers of the European Control Conference 2022.

- A conference on Innovations in Nonlinear Control 2023 was organized during February 13-17, 2023, and was convened by Prof. Debasish Chatterjee.

- A workshop on Mechanics and Control 2023 was organized during March 15-18, 2023, and was convened by Prof. R. N. Banavar.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	-	08	25

Ashank Desai Centre for Policy Studies

The Centre was set up in 2016 to boost the study of public policy. It was renamed as Ashank Desai Centre for Policy Studies (ADCPS) in 2021. During the academic year 2022-23, the Ashank Desai Centre for Policy Studies continued its mandate of core policy research in various sectoral areas.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	09
No. of Post-Doc Fellows	-

Academic Programmes: ADCPS offers a Doctoral programme and Master's programme in Public Policy.

Total no. of students on-roll: 88

Programmes Offered	Students Intake	Degrees Awarded
MPP	15	17
PhD	08	-

R&D Activities: Policy studies is a relatively nascent discipline in India. Currently, the Centre is involved in five key policy research areas: digital society and governance, social policy (education, ageing, identity), technology and policy, urban policy, water, sanitation, energy and climate change.

Projects	Sponsored Projects	Consultancy Projects
New Projects	04	01
Ongoing	04	03
Completed	-	-

Outreach/ Publicity Activities:

- ADCPS and the Bavarian School of Public Policy hosted a "Summer School" at TU Munich and a "Winter School" in Kerala in November and December 2022, respectively.

- ADPCS launched *'Living Lab for Just Transitions Alleppey: A Project of IIT Bombay'* in March 2023 to advance ongoing work on local governance relating to challenges of water sanitation and flood resilience.

- ADCPS organized three policy dialogues on:
  1. Environmental Legislations, led by Prof. N.C. Narayanan
  2. Emerging Issues in Rural Drinking Water Governance in coordination with TISS Mumbai, led by Prof. N.C. Narayanan
  3. Gig and Platform Economy in coordination with NITI Aayog, led by Prof. Shishir K. Jha

- The third edition of *Atelier: Talking Policy Through Cinema*, the annual film festival, was organized during September 21-24, 2022, by Prof. Prabhir Vishnu Poruthiyil.

- During the year 2022-23, about 16 policy-relevant talks were conducted on various topics.

- The first ADCPS working paper series, titled *'Changing Role of the State in Rural Drinking Water Governance in India,'* was released. The link to the paper is: https://www.cps.iitb.ac.in/research/wps/.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	07	09	14

Centre for Machine Intelligence and Data Science

The Centre for Machine Intelligence and Data Science (C-MInDS) at IIT Bombay was set up in February 2020 to contribute towards the growing significance of the role of Artificial Intelligence (AI), Data Science (DS) and related areas in different application domains. The activities of the Centre leverage the existence of a strong interdisciplinary academic community and the important research

endeavours carried out by various researchers and faculty members. The Centre aims to be engaged actively to nurture the future talent pool in AI and DS primarily through research, teaching, and collaboration with industry and the government.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	02
No. of Post-Doc Fellows	

Academic Programmes: The Centre offers a Master of Science (MS) by Research and a Doctor of Philosophy in Machine Learning (ML) and Artificial Intelligence (AI), an Interdisciplinary Dual Degree Programme (IDDDP) and a Minor Programme in Artificial Intelligence (AI) and Data Science (DS).

Total no. of students on-roll: 18

Programmes Offered	Students Intake	Degrees Awarded
MS by Research	12	-
PhD	06	-

R&D Activities: The associated faculty members of CMInDS are engaged in industrial R&D projects with several organizations in different research areas, including natural language processing (NLP) and speech technologies, image processing and computer vision, decision-making systems, materials modelling and discovery, as well as foundational research in machine learning (ML) and deep learning (DL).

The Centre is also working on drafting Grand Challenges in the areas of Public Data and AI/ML in engineering. Recently, a lab space for researchers and students has been setup with dedicated servers and GPUs for large ML models.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total			391 (in 2022 by CMInDS Associated faculty members)	

Centre of Studies in Resources Engineering

Established in 1976, the Centre of Studies in Resources Engineering (CSRE) is noted for its research in the areas of machine learning, synthetic aperture radar and hyperspectral image analysis, GPS applications, high-performance computing, geospatial IoT, mineral exploration, agro-informatics, cryosphere, water resources, hydrology and so on. The Centre's work was published in some of the best-known journals and presented in several prestigious conferences.

The Centre continues its international collaborations in areas such as microwave remote sensing, geology and mineral resources and data sciences in agriculture. The Centre has developed excellent infrastructure in terms of state-of-the-art software, hardware, laboratories and air-borne hyperspectral imaging.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	11
No. of Post-Doc Fellows	01

Academic Programmes: The Centre offers MTech and Minor programme in Geoinformatics and Natural Resources. A total of 17 electives and core courses are offered by the Centre.

Total no. of students on-roll: 113

Programmes Offered	Students Intake	Degrees Awarded
MTech	32	24
PhD	12	08
DD (MTech +PhD)	-	01
PGDIIT (Exit)	-	01

R&D Activities: The Centre has been actively working on many research and development activities through projects covering geoinformatics and applications to earth systems. The major fields of research include optical and microwave remote sensing; geo-computation and GIS; satellite image processing and analysis; IoT; photogrammetry,

GNSS & GPS; oceanography and marine science; atmospheric studies; agroinformatics and precision agriculture; water resources; climate change modelling; snow, glaciers and ice studies; natural hazards and disaster management; forestry and ecology; infrastructure planning; geology and mineral exploration; planetary sciences; surveying and geodesy; urban development and town planning. In addition, the Centre also engaged in various consultancy services in the area of geoinformatics and its applications to natural resources exploration and management.

Projects	Sponsored Projects	Consultancy Projects
New Projects	03	04
Ongoing	16	11
Completed	-	05

Outreach/ Publicity Activities:

During the year 2022-23, the Centre held various events including:

- International Workshop (Hybrid) on Remote Sensing of Cryosphere (WRSC 2023), conducted during March 13-15, 2023. Prof. Gulab Singh was incharge for this workshop

- 2nd International Soil Moisture School, organized during March 15-17, 2023, convened by Prof. Avik Bhattacharya and Prof. Karthikeyan Lanka

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	04	04	24	47

⬆ *Participants of International Soil Moisture School held during March 15-17, 2023 at IIT Bombay*

Centre for Technology Alternatives for Rural Areas

The Centre for Technology Alternatives for Rural Areas (CTARA) was established at IIT Bombay in 1985 with a vision to develop appropriate technology solutions through fieldwork for the informal sector.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	13
No. of Post-Doc Fellows	02

Academic Programmes: The Centre offers an MTech programme in Technology and Development with a focus on training development sector professionals and a PhD programme. It also offers Technology and Development Supervised Learning (TDSL). A new one-year "Masters in Development Practice" programme on the guidelines of the Master in Engineering (M. Eng.) programme was launched in the year 2022 for young professionals in development sector with field experience to build their academic and analytical abilities.

Following five new courses were proposed in the year 2022-23:

1. Development Perspectives: Ideas, Approaches and Theories
2. Bamboo Construction for Rural Infrastructure

3. Health and Wellness through a lifecycle approach
4. Data for Development
5. Design of Bamboo Structures

Total no. of students on-roll: 130		
Programmes Offered	Students Intake	Degrees Awarded
MTech	29	31
DD (MTech+PhD)	-	01
PhD	09	05

R&D Activities: Research is being conducted in Nandurbar, an aspirational district, on effective breastfeeding practices and the training of HCWs using Health Spoken Tutorials to decrease malnutrition in babies under 3 months of age.

A memorandum of understanding (MOU) was signed between Save the Children (Bal Raksha Bharat) and CTARA, IIT Bombay, solidifying their commitment to collaborative efforts in achieving common goals of Maternal, Infant and Young Child Nutrition (MICYN) during the Poshan Dialogue Symposium held on January 18, 2023.

Projects	Sponsored Projects	Consultancy Projects
New Projects	05	-
Ongoing	29	06
Completed	07	03

Outreach/ Publicity Activities:

The Centre organized various outreach activities including:

- **Symposiums:**
1. SEED Annual Symposium on Sustainable Energy and Entrepreneurship Development
2. One-day symposium titled "Poshan Dialogue" to explore opportunities for multi-sectoral coordination and collaboration aimed at strengthening Maternal, Infant and Young Child Nutrition (MICYN)

- **Workshops:**
1. Unnat Bharat Abhiyan (UBA) workshops

2. Three-day workshop for spinning cotton yarn on the charkha for the IIT Bombay students
3. IIT Bombay-FOSSEE Mapathon workshop in Tirupati and Tamil Nadu
4. Two-week training workshop on Data-Driven Agriculture: Tool and Techniques at CTARA for Parbhani Agriculture University
5. GRACERS workshop
6. National Workshop on Preparedness, Mitigation and Management of Heat Wave for 2023
7. Workshop on Malnutrition in babies and mothers in Bhavnagar, Gujarat
8. Mapathon workshop series
9. Exposure Visit of Jashpur (Chhattisgarh) High School students to IIT Bombay under Collector's Initiative
10. Roundtable discussion on 'Multidimensional poverty, food security, and the role of safety nets in India'

- **Training programmes:**
1. Child Nutrition Training In Nandurbar
2. Participatory Rural Appraisal (PRA) training
3. Interaction with IIT Bombay Alumni in Civil Services
4. Trainings of senior Class-I Officers of the Maharashtra Government in Data appreciation and Management
5. Training and handholding workshop for developing Rural Development Centre like CTARA at IIT Indore

- **Seminars:**
1. The Diversification of Agroecosystems: Uncovering Indicators and Outcomes
2. Nutrition through Life Cycle: Lifelong Health and Prevention of Diseases
3. Cotton Tales from Vidarbha: The Longue durée and a Longitudinal Study
4. Gaon Connection, Rural Journalism
5. Nutrition: The Magic of Breast Milk
6. Story of "Story of Makers", a multi-dimensional initiative in the field of education

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	02	03	28

SEED Annual Symposium on Sustainable Energy and Entrepreneurship Development

Symposium on 'Poshan Dialogue'

Centre For Urban Science and Engineering

The Centre for Urban Science and Engineering (C-USE) was set up in 2013 with the focus to improve the urban quality of life. Though in its nascent stage, the Centre has been able to leave its mark as one of the major academic units contributing to the emerging field of urban science and engineering. The Centre aims to combine science and technology with sustainable, equitable and human-friendly design to deliver innovative and holistic services to improve the quality of life of the rapidly urbanizing population in the developing world.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	06
No. of Post-Doc Fellows	-

Academic Programmes: The Centre currently offers Master of Technology and PhD programmes. The Centre is interdisciplinary in nature and has multifaceted faculty (core and associated).

Total no. of students on-roll: 45

Programmes Offered	Students Intake	Degrees Awarded
MTech	10	07
PhD	06	06

R&D Activities: The Centre is actively involved in basic and applied research and consultancy and provides high-quality technical advisory support through various R&D projects and consultancy to various organizations. The research activities of the Centre focus on new products and solutions related to housing, transport, water management, energy efficiency, urban informatics, health, governance, urban poverty and citizen science while mitigating the effects of natural disasters and climate change. The Centre aims to establish links with various institutes in India and abroad, addressing urban challenges.

Projects	Sponsored Projects	Consultancy Projects
New Projects	01	02
Ongoing	06	03
Completed	01	01

Outreach/ Publicity Activities:

- The 1st ACM workshop on Advancements in Building Energy Benchmarking Systems was held virtually as part of the ACM BuildSys conference in New York. Prof. Chirag Deb was the co-chair of the workshop.

- A workshop titled "What's in a meter?," was held in collaboration with Teesside University to disseminate the findings from the project funded by the British Academy and was convened by Prof. Arnab Jana

- A workshop on "Liquid Waste Management in Rural and Urban Areas: Strategies to Scale-up

Eco-Prudent Solutions" was held on June 2, 2022, organized by IIT Bombay for the DST funded project "Innovation Centre for Eco-Prudent Wastewater Solutions (IC-EcoWS)". Prof. Pradip Kalbar was the convener.

- A workshop on "Strategies to Improve Intermittent Water Supply and Pathways to Achieve 24x7 Continuous Water Supply" was held on February 23, 2023, under a CSR-funded sponsored research project by STEM Water Distribution and Infrastructure Company Pvt. Ltd., Thane. Prof. Pradip Kalbar was the convener.

- A symposium on Urban Pedagogy was held during March 17-18, 2023, and was convened by Prof. Himanshu Burte.

Student Achievements:

- Jeetika Malik has won the Prestigious Naik and Rastogi Award for Excellence in Ph.D. Research (2020-2022).

- Ashish Nair has received the Prestigious Prime Minister's Research Fellowship in the Year 2023.

- The paper presented by Dr. Anujkumar Ghorpade and co-authored by Abhishek Kumar Sinha and Prof. Pradip Kalbar on 'Zonal Storage with Hydraulic Isolation Structures for Equitable Water Supply' (A novel method for water distribution design) was awarded the first prize at the 55th Annual IWWA Convention, Pune, conducted in January 2023.

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	01	08	14	17

Koita Centre for Digital Health

The Koita Centre for Digital Health (KCDH) at IIT Bombay is the first-of-its-kind in India, focusing on driving academic programmes, research and industry collaborations in digital health. KCDH was established in June 2021 with a generous contribution from IIT Bombay alumni Rekha Koita (BTech, Metallurgical Engineering and Materials Science, 1992) and Rizwan Koita (BTech, Electrical Engineering, 1992), under the aegis of the Koita Foundation (www.koitafoundation.org), to address the needs of engineers, clinical professionals and entrepreneurs in digital health and to develop technology for social benefits. KCDH has successfully completed its two years of operations and crossed many important milestones. As envisioned, KCDH has become a multi-disciplinary hub of digital health activities at IIT Bombay. More than 60 faculty members from 20 different departments and centres are actively involved in the Centre's activities. KCDH is proud to have a world-class advisory board with renowned members from diverse backgrounds, including the CEOs and ex-presidents of leading global medical technology firms, directors of renowned hospitals and professors from top universities around the world.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	03
No. of Post-Doc Fellows	01

Academic Programmes: KCDH offers a PhD programme in Digital Health, an Interdisciplinary Dual Degree Programme (IDDDP) in Healthcare Informatics and a Minor programme in Healthcare Informatics. These courses are offered to all students as an institute elective.

The following two new courses have been introduced in the year 2022-23:

- DH 803 Wearable Health Technologies

- DH 307 R&D Project Course

KCDH continues to provide support services

to KCDH and other students for internships and in-semester projects.

Total no. of students on-roll: 10

Programmes Offered	Students Intake	Degrees Awarded
PhD	12	-

R&D Activities: To promote interdisciplinary collaborations, KCDH signed MoUs with various digital health partners (DHP), including Sankara Netralaya, Kokilaben Dhirubhai Ambani Hospital and Medical Research Institute, KEM Hospital and Tata Memorial Hospital.

KCDH has also has established a computational lab equipped with 12 GPU systems, 4 high-performance workstations and 2 high-performance GPUs, enabling students and faculty with access to high-end computational facilities to conduct cutting-edge research and analysis using the latest technology.

Outreach/ Publicity Activities:

- In a one-of-a-kind collaboration, IIT Bombay and Maharashtra University of Health Sciences (MUHS) signed an MoU in February 2023 to promote interaction between the technology institute and the health sciences university. The MoU enables both institutions to share resources for academics and R&D in diverse areas of mutual interest. Prof. Subhasis Chaudhuri, Director, IIT Bombay and Lt. Gen. Dr. Madhuri Kanitkar, Vice Chancellor-MUHS, signed the MoU.

- IIT Bombay has signed an international memorandum of understanding (MoU) with Johns Hopkins University for a joint Breakthrough Research Grants programme. The programme enables catalytic funding for up to three collaborative research projects involving IIT Bombay and JHU faculty. The Koita Centre for Digital Health at IIT Bombay

and John Hopkins University, USA, will jointly fund the projects.

- 'Digital Health' was one of the five themes organized by the Koita Centre for Digital Health (KCDH) in the RB Memorial virtual conference on April 19, 2022, titled 'Translational Research in Medicine (TRIM) in the memory of late Prof. Rinti Banerjee, a pioneer scientist in the field of nanomedicine, drug delivery and biomaterials, hosted by Department of Biosciences and Bioengineering (BSBE).

- An orientation workshop for state-level Joint Directors/ Directors of Ayushman Bharat Digital Mission in the Ayushman Bharat Digital Mission (ABDM) framework and ABDM national rollout was hosted by KCDH in partnership with the NHA (National Health Authority)

- Talk on 'How modelling and digital transformation can improve healthcare' by Prof. Michael O'Sullivan, University of Auckland.

- Session on 'Cyber Security in Digital Health' by Prof. Chris Bain, Monash University

- Session on 'The role of MRI and MR Spectroscopy in clinical medicine'

- Fireside Chat by Mr. Rizwan Koita on 'Career Opportunities in Digital Health'

- Panel discussion on 'Digital Health Infrastructure in India'

- Interaction with Mr. Rizwan Koita and Ms. Rekha Koita on 'Advancement possibilities and adoption of digital healthcare in India'

- Webinar Talk on 'Digital Health: Path to a Global Career'

- Workshop on 'Hands-on Analysis of Healthcare Data'

Publications:

	Books Published	Chapters in Books	Papers in Conference	Papers in Journals
Total	-	01	11	18

⬆ *MoU signing ceremony with Maharashtra University of Health Sciences in February 2023*

⬆ *Interaction of donors Ms. Rekha and Mr. Rizwan Koita with KCDH students, faculty and staff*

Centre for Research in Nanotechnology and Science and Sophisticated Analytical Instrumental Centre

IIT Bombay is one of the leading institutes in the country for Nanoscience and Nanotechnology research. The Centre for Research in Nanotechnology and Science (CRNTS) was formed in the year 2005 through a generous grant from the Department of Science and Technology (DST), Government of India. This Centre engages in interdisciplinary research in nanoscience and nanotechnology.

Total no. of faculty (Assistant/ Associate/ Full Professors/ Adjunct/ {Visiting-teaching faculty)	-
No. of Post-Doc Fellows	01

Academic Programmes: The associated faculty members in CRNTS are faculty members in various academic units at IIT Bombay who guide the enrolled PhD students on both fundamental and applied aspects of nanoscience and nanotechnology research.

Total no. of students on-roll: 98

Programmes Offered	Students Intake	Degrees Awarded
PhD	07	11

R&D Activities: The broad research areas at CRNTS include Nanomaterials; Nanosensors; Nanoelectronics; Nanobiotechnology and Nanomanufacturing. Some current research topics include: Micromechanical theory for explaining the colloidal aggregation phenomenon; Nanoparticles and nanocomposites for removal of organic pollutants and heavy metals from water; Nanostructures for Environmental Biosensors; Ecotoxicological studies on nanomaterials; 3D printing for the development of flexible electronic devices and sensors; Polymer composite membranes for water-oil separation; Investigation of damage mechanisms in nanocomposites using

experiments and multiscale modeling; and Structure-property correlations of additively manufactured nano-concrete.

The Centre hosts the Sophisticated Analytical Instrument Facility (SAIF), which houses a variety of well-maintained major analytical instruments in operation. SAIF IIT Bombay, funded by DST, serves as an academic, research and scientific service provider and a facilitator available for users across the country. Various additional advanced instrumentation facilities have been set up in CRNTS to meet the advanced instrumentation needs of IIT Bombay researchers across various academic units. PhD research scholars from various academic units are trained to operate the advanced instrumentation facilities to enhance their utilization and facilitate state-of-the-art research at IIT Bombay. SAIF/ CRNTS also supports various interdisciplinary academic activities and research by conducting workshops, webinars and training programmes.

A wide range of analytical techniques for chemical analysis and material testing and characterization, including qualitative and quantitative elemental analysis, molecular analysis, structure determination, surface topographic studies and physical, optical and electrical characterization of materials are available in SAIF and CRNTS. Around 2964 users from academic institutes, national labs and industry utilized the SAIF and CRNTS facilities at IIT Bombay to analyze 27,826 samples during the financial year 2022-23.

Following three are the Department of Science and Technology (DST)-funded new facilities recently installed in the Centre:

⬆ *CHNS (O) Analyzer at SAIF/ CRNTS Model Flash smart V CHNS/ O, Thermo Fisher Scientific Pvt. Ltd., USA*

1. **A CHNS (O) Analyzer** is an instrument that allows the estimation of CHN/ CHNS/ O at percentage levels up to a high concentration level. It is used for the determination of the elemental composition of a sample and for determining product quality. This instrument can simultaneously measure all elements and is equipped with an autosampler.

2. **Thermogravimetry/ Differential Thermal Analyzer (TG-DTA)** has applications in the estimation of thermal stability for quality assurance and safety purposes, kinetics analysis, determination of glass transition temperature and in endothermic (melting) and exothermic reactions (crystallization).

⬆ *Thermogravimetry/ Differential Thermal Analyzer (TG-DTA) Model: NEXTA STA300, Hitachi, Japan*

3. **Differential Scanning Calorimetry (DSC)** has applications in the determination of glass transition temperature, melting and crystallization temperature, percent crystallinities, compositional analysis of blends, thermal histories, thermal denaturation of proteins, purity determination and drug compatibility studies.

⬆ *Differential Scanning Calorimetry (DSC) Model: DSC7020, Hitachi, Japan*

4. **A Laser Raman Imaging System (LRIS)** is a central facility at IIT Bombay recently installed in SAIF/ CRNTS through IOE fund. It has applications in pharmaceuticals and cosmetics, geology and mineralogy, carbon materials, semiconductors, life sciences and polymer science.
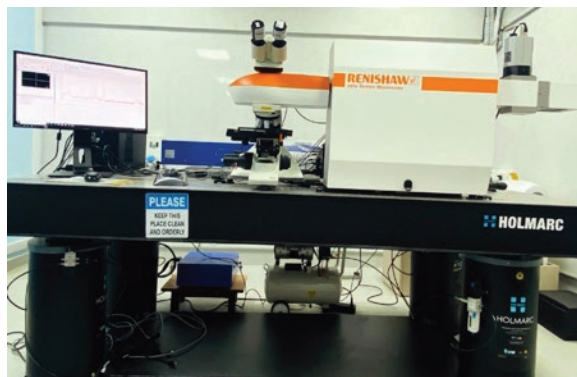
Laser Raman Imaging System (LRIS)
Model: Invia Reflex, Renishaw, UK

Projects	Sponsored Projects	Consultancy Projects
New Projects	-	-
Ongoing	02	04
Completed	01	-

Outreach/ Publicity Activities:

During the year 2022-23, the Centre organized various webinars and workshops on sophisticated instruments, including Latest advancements in new XRD, Non-ambient and SAXS applications; CHNSO Elemental Analyser and its Applications; Nano Particle Characterization by Dynamic Light Scattering; Theory and Instrumentation of DSC and TGA and their applications in various fields; ICP-OES-Simultaneous and Cost Effective Multi-Elemental Analysis; Introduction to Atom Probe Tomography (APT), fundamentals, technology, specimen preparation and example of applications; Flexible and easy to use SEM for the widest range of samples; Basics of TEM and Analytical Electron Microscopy (AEM); Material Characterization by Thermal Analysis Techniques.

SAIF/ CRNTS received a large number of visitors from academia and industry across the country and abroad for exploring the areas of collaboration and learning. Major ones are as follows:

- National Polytechnic Institute of Mexico
- Amity University Mumbai
- Department of Physics,University of Mumbai
- Amar Equipment, IIT Bombay Research Park
- National Centre for Nanoscience and Nanotechnology, University of Mumbai
- Indian Oil Corporation
- Bhartiya Vidyapeeth, Navi Mumbai
- Sumatibhai Shah Ayurved Mahavidyalaya, Pune
- K.C. College, Mumbai
- Bhavan's College, Mumbai
- Pillai College of Engineering, Navi Mumbai
- Prof. Jacek Piotr Fiutowski and Thomas TølbølSørensen from University of Southern Denmark (SDU) Denmark
- Prof. Andrew Hursthouse, Prof. Fiona Henriquez-Mui and Dr. Kiri Rodgers from The University of the West of Scotland (UWS), Scotland and Prof. John Connolly, Glasgow Caledonian University (GCU), Scotland

Students from Pillai College of Engineering, Navi Mumbai visit SAIF/ CRNTS, IIT Bombay

SAIF Technical Officers visit Roha Industrial Area

PUBLICATIONS

The number of publications by faculty members of IIT Bombay are steadily increasing. From 2024 papers published in national and international journals during the year 2018-19, the total number of papers published in 2022-23 has increased by 351 papers in mere five years, taking the total number of papers published to 2375. Similar trends can be observed for the papers presented and chapters in books published authored by the Institute's faculty, in the graph given below::
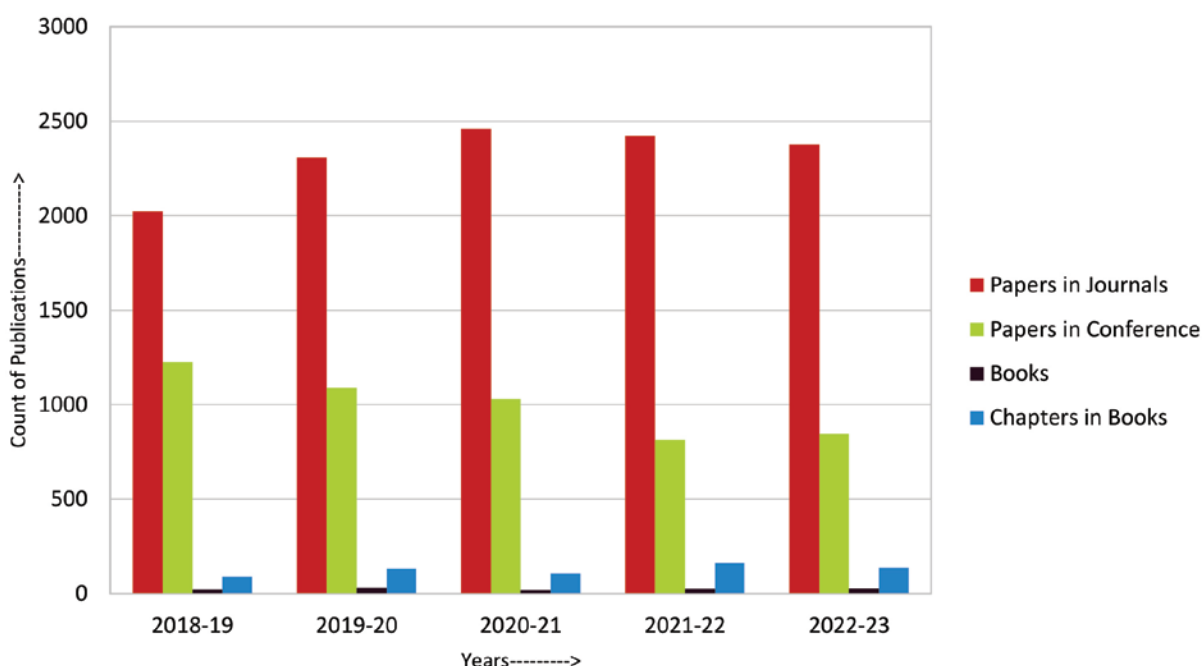
Year	Papers in Journals	Papers in Conferences	Books	Chapters in Books
2018-19	2024	1225	21	89
2019-20	2308	1090	29	131
2020-21	2461	1030	18	107
2021-22	2423	807	23	163
2022-23	2375	845	26	136

ORGANIZATION

Chairman, Board of Governors
Dr. Pawan Goenka
(upto July 11, 2022)

Chairman, Board of Governors
Dr. Sharad Kumar Saraf
(from July 12, 2022)

Prof. Subhasis Chaudhuri
Director

Prof. S. Sudarshan
Dy. Director (Academic and
Infrastructural Affairs)

Prof. K.V.K. Rao
Dy. Director
(Finance and External Affairs)

Prof. Milind Atrey
Dean (Research and
Development)

Prof. Avinash Mahajan
Dean (Academic Programmes)

Prof. Ravindra Gudi
Dean (Alumni and Corporate
Relations)

Prof. Tom V. Mathew
Dean (Infrastructure Planning
and Support)

Prof. Tapanendu Kundu
(Dean (Students Affairs
(upto March 2, 2023)

Prof. Suryanarayana Doolla
Dean (Students Affairs)
(from March 3, 2023)

Prof. Amit Agrawal
Dean (International Relations)

Prof. Neela Natraj
Dean (Faculty Affairs)

Prof. K.P. Kaliappan
Dean (Strategy)
(from August 3, 2022)

Prof. Siddhartha Ghosh
Dean (Educational Outreach)
(from June 13, 2022)

Prof. S. V. Kulkarni
Dean (Administrative Affairs)

Mr. Ganesh K. Bhorkade
Registrar

IIT COUNCIL

The Minister In-charge of Technical Education in the Central Government	1	Shri Dharmendra Pradhan, Hon'ble Minister of Education, Government of India, Shastri Bhavan, New Delhi – 110 001.	Chairperson

Chairman of Each Institute (Ex-officio)			
Kharagpur	2	Dr. Rajendra Prasad Singh (from 12.07.2022) Shri Sanjiv Goenka (up to 11.07.2022) Chairperson, BoG, IIT Kharagpur [Chairman, RP-Sanjiv Goenka Group pvt. Ltd., Kolkata]	Member
Bombay	3	Dr. Sharad Kumar Saraf (from 12.07. 2022), Dr. Pawan Goenka,(up to 11.07. 2022) Chairperson, Board of Governors, IIT Bombay, Mumbai-400076 [Chairman, Technocraft Industries (India) Ltd., Technocraft Group, Bombay, Technocraft House, A-25, MIDC, Marol Industrial Area, Road No. 3, (Opposite ESIS Hospital), Marol Industrial Area, Andheri (East), Mumbai – 400 093]	Member
Madras	4	Dr. Pawan Goenka, Chairperson, BoG, IIT Madras, Chennai – 600 036 [MD and CEO, Mahindra and Mahindra, Mahindra Towers GM Bhosale Marg, Worli, Mumbai]	Member
Kanpur	5	Dr. K. Radhakrishnan Chairperson, BoG, IIT Kanpur, Kanpur – 208 016. [Former Chairperson, Space Commission/ Secretary, Dept. of Space and former Chairman, ISRO]	Member
Delhi	6	Dr. R. Chidambaram Chairperson, Board of Governors, IIT Delhi [Former PSA to the Government of India, DAE-Homi Bhabha Chair Professor Bhabha Atomic Research Centre, Trombay, Mumbai- 400085] New Delhi – 110 016.	Member

Guwahati	7	Dr. Rajiv I. Modi, Chairperson, Board of Governors, IIT Guwahati, Guwahati – 781 039.	Member
Roorkee	8	Shri. B. V. R. Mohan Reddy Chairperson, BoG, IIT Roorkee Roorkee – 247 667.	Member
Bhubaneswar	9	Dr. Rajendra Prasad Singh, Chairperson, Board of Governors, IIT Bhubaneswar, Bhubaneswar (Odisha). [Chairman and Managing Director, Power Grid Corporation and Independent Director, Azure Power Global Ltd.]	Member
Gandhinagar	10	Dr. Rajiv I. Modi (from 12.07.2022) Shri Sanjiv Goenka (up to 11.07.2022) Chairperson, Board of Governors Indian Institute of Technology Gandhinagar	Member
Hyderabad	11	Dr. B. V. R. Mohan Reddy Chairperson, BoG, IIT Hyderabad. (A.P.) [Chairman and Managing Director, Infotech Enterprises Ltd. Plot No. 11, Software Unit Layout, Infocity, Madhapur, Hyderabad – 500081]	Member
Jodhpur	12	Dr. R. Chidambaram, Chairperson, BoG, IIT Jodhpur, Jodhpur (Rajasthan) [Former PSA to the Government of India, DAE- Homi Bhabha Chair Professor, Bhabha Atomic Research Centre, Trombay, Mumbai- 400085]	Member
Indore	13	Prof. D. B. Phatak Chairperson, BoG, IIT Indore, Indore (M.P.)	Member
Mandi	14	Prof. Prem Vrat, Chairperson, BoG, IIT Mandi, Mandi (H.P.) [Retired Professor of IIT Delhi and Founder Director, IIT Roorkee, New Delhi]	Member
Patna	15	Mr. Anand Deshpande, Chairperson, Board of Governors, Indian Institute of Technology Patna (Bihar). [Founder, Chairman and Managing Director, Presistent Systems Inc. Pune]	Member
Ropar	16	Dr. K. Radhakrishnan Chairperson, Board of Governors, Indian Institute of Technology Ropar (Punjab)	Member

Varanasi	17	Dr. Kota Harinarayana, Chairperson, Board of Governors, Indian Institute of Technology (BHU), Banaras Hindu University, Varanasi -221 005 (U.P.) [Former Scientist DRDO and Former Vice Chancellor, Hyderabad University, Bengaluru (Karnataka)]	Member
IIT (ISM) Dhanbad	18	Prof. Prem Vrat, Chairperson, Board of Governors, IIT (ISM) Dhanbad [Retired Professor of IIT Delhi) and Founder Director, IIT Roorkee, New Delhi]	Member
IIT Dharwad	19	Shri Vinayak Chatterjee, Chairperson, Board of Governors, IIT Dharwad [Co-Founder and Chairperson Feedback Infra Services Pvt. Ltd.]	Member
IIT Palakkad	20	Shri Ramesh Venkateswaran Chairperson, Board of Governors, Palakkad. [Visiting Faculty, Indian Institute of Management (IIM), Bengaluru]	Member
IIT Jammu	21	Dr. Sharad Kumar Saraf Chairperson, Board of Governors, IIT Jammu. [Chairman and Managing Director, Technocraft Group of Industries, Mumbai]	Member
IIT Bhilai	22	Shri Krishnamurthi Venkataramanan Chairperson, Board of Governors, IIT Bhilai. [Former Managing Director and CEO, Larsen and Toubro Limited (L&T Limited)]	Member
IIT Goa	23	Secretary (HE), MoE, Department of Higher Education, Chairperson, Board of Governors, IIT Goa.	Member
IIT Tirupati	24	Secretary (HE), MoE, Department of Higher Education, Chairperson, Board of Governors, IIT Tirupati.	Member

Director of Each Institute (Ex-officio)			
Kharagpur	25	Prof. V. K. Tewari Director, IIT Kharagpur, Kharagpur – 721 302.	Member
Bombay	26	Prof. Subhasis Chaudhuri, Director, IIT Bombay, Mumbai – 400 076.	Member

Madras	27	Prof. V. Kamakoti, Director, IIT Madras, Chennai – 600 036.	Member
Kanpur	28	Prof. Abhay Karandikar, Director, IIT Kanpur, Kanpur – 208 016.	Member
Delhi	29	Prof. Rangan Banerjee, Director, IIT Delhi, Hauz Khas, New Delhi – 110 016.	Member
Guwahati	30	Prof. Parameswar K. Iyer (from December 2022) Prof. T. G. Sitharam (upto December 2022)	Member
Roorkee	31	Prof. Kamal Kishore Pant (from 12.10.2022), Prof. Ajit Kumar Chaturvedi (up to 11.10.2022), Director, IIT Roorkee, Roorkee – 247 667.	Member
Bhubaneswar	32	Prof. Shreepad Karmalkar (from 17.11.2022), Prof. V.K. Tiwari (up to from 16.11.2022), Director, IIT Bhubaneshwar, Samantapuri (Rear side of Hotel Swosti Plaza), Jaydev Vihar, Bhubaneswar – 751 013, Odisha.	Member
Gandhinagar	33	Prof. Rajat Moona (from 21.09.2022), Prof. Amit Prashant (up to 20.09.2022), Prof. Sudhir K. Jain (upto 03.04.2022) Director, IIT Gandhinagar, Vishwakarma Govt. Engg. College (VGEC) Campus, Chandkheda, Visat-Gandhinagar Highway, Ahmedabad – 382424.	Member
Hyderabad	34	Prof B. S. Murty, Director, IIT Hyderabad, Ordnance Factory Estate, Yeddumailaram – 502205, Andhra Pradesh.	Member
Jodhpur	35	Prof. Santanu Chaudhury, Director, IIT Jodhpur, IIT Rajasthan Camp Office Jodhpur – 342 011.	Member
Indore	36	Prof. Suhas Joshi, Director, IIT Indore, Institute of Engineering and Technology, DAVV Campus, Khandwa Road, Indore -452 017.	Member
Mandi	37	Prof. Laxmidhar Behera Director, IIT Mandi, PWD Rest House, 2nd Floor, Near Bus Stand, Mandi – 175 001. (Himachal Pradesh)	Member

Patna	38	Prof. T.N. Singh (from 10.09.2021) Prof. Pushpak Bhattacharyya, (up to 09.09.2021) Director, IIT Patna, Govt. Polytechnic, Pataliputra's Colony, Patna – 800 013.	Member
Ropar	39	Prof. Rajeev Ahuja, Director, IIT Ropar, Nangal Road, Rupnagar, Punjab – 140 001.	Member
Varanasi	40	Prof. Pramod Kumar Jain, Director, Indian Institute of Technology (BHU), Varanasi – 221005 (UP).	Member
Dhanbad	41	Prof. Rajiv Shekhar, Director, Indian Institute of Technology (IIT) (ISM), Dhanbad, Jharkhand– 826004.	Member
Tirupati	42	Prof. K.N. Satyanarayana, Director, Indian Institute of Technology Tirupati, Andhra Pradesh– 517506.	Member
Palakkad	43	Prof. A. Seshadri Sekhar (from 20.09.2022), Prof. P. B. Sunil Kumar (up to 19.09.2022), Director, IIT Palakkad, Kerala – 678557.	Member
Goa	44	Prof. B. K. Mishra, Director, IIT Goa, Goa, 403401.	Member
Bhilai	45	Prof. Rajiv Prakash (from 20.09.2022) Prof. Rajat Moona (up to 19.09.2022) Director, IIT Bhilai, Chhattisgarh 492015.	Member
Dharwad	46	Prof. Venkappayya R. Desai (from 20.09.2022) Prof. Seshu Pasumarthy (up to 19.09.2022) Director, IIT Dharwad, Karnataka 580011.	Member
Jammu	47	Prof. Manoj Singh Gaur, Director, IIT Jammu, Jammu and Kashmir 181 221.	Member
Chairman, University Grants Commission (Ex-officio)	48	Prof. M. Jagadesh Kumar Chairman, University Grants Commission, Bahadurshah Zafar Marg, New Delhi – 110 002.	Member
Director-General, Council of Scientific and Industrial Research (Ex-officio)	49	Dr. S. C. Mande, Director General (DG) of Council of Scientific and Industrial, Research (CSIR), Government of India, Anusandhan Bhawan, 2, Rafi Marg, New Delhi – 110 001.	Member

Chairman of the Council of the Indian Institute of Science, Bangalore (Ex-officio)	50	Dr. P. Rama Rao, Chairman, Governing Council of IISc. Bengaluru, (and Former Vice Chancellor, University of Hyderabad, Balapur, Hyderabad 50005) Indian Institute of Science Campus, Bengaluru – 560 012.	Member
Director of the Indian Institute of Science, Bangalore (Ex-officio)	51	Prof. Govindan Rangarajan, Director, Indian Institute of Science, Bangalore – 560 012.	Member
Three Nominees of the Central Government			
To represent the Ministry concerned with Technical Education	52	Dr. Rakesh Ranjan, Additional Secretary (TE), Ministry of Education, Department of Higher Education, 118-C Shastri Bhawan, New Delhi -110015.	Member
To represent the Ministry of Finance	53	Secretary (Expenditure), Ministry of Finance, Department of Expenditure, North Block, New Delhi – 110 001.	Member
To represent any other Ministry	54	Secretary, Department of Information Technology, Electronics Niketan, CGO Complex, Lodhi Road, New Delhi – 110003.	Member
Nominee of the Visitor Council for Technical Education (AICTE)	55	Prof. Anil D. Sahasrabudhe, Chairman, All India Council for Technical Education (AICTE), 7th Floor, Chanderlok Building, Janpath, New Delhi – 110 001.	Member
Nominees of the Visitor (minimum three) (maximum five)	56	Prof. Avinash Kumar Agarwal, Department of Mechanical Engineering, IIT Kanpur, Kanpur, Uttar Pradesh.	Member
	57	Prof. Shreepad Karmalkar, Professor, Department of Electrical Engineering, IIT Madras, Chennai – 600 036.	Member

	58	Shri S. N. Subrahmanyan, CEO and MD Larsen and Toubro Limited.	Member
	59	Shri S. Somanath, Chairman, ISRO, and Secretary, Department of Space.	Member
	60	Dr. Shekhar C. Mande, Former Secretary, DSIR and Director Ceneral, CSIR, New Delhi.	Member
Three Members of Parliament (Two from Lok Sabha) (One from Rajya Sabha)	61	Mr. Kunar Hembram, Hon'ble Member of Parliament (Lok Sabha), Vill. Kanyadoba, P. O. and P. S. Jhargram, Distt. Jhargram – 721507, West Bengal.	Member
	62	Mr. Lavu Sri Krishna Devarayalu, Hon'ble Member of Parliament (Lok Sabha), 10, Western Court Annexel, New Delhi - 110001.	Member
	63	Shri Prabhat Jha, Hon'ble Member of Parliament (Rajya Sabha), C-501, Swaran Jayanthi Sadan, Dr. Bishamber Dass Marg (Near R.M.L), New Delhi-110001.	Member
	64	Shri K. Sanjay Murthy, Secretary (Higher Education), and the current Chairperson, BoG of two IITs at Tirupati, and Goa, Ministry of Education, Department of Higher Education, Shastri Bhawan, New Delhi.	Member
	65	Ms. Darshana M. Dabral, Joint Secretary and Financial Advisor (JS&FA) Ministry of Education, Department of Higher Education, New Delhi.	Member

Members of the Board of Governors		
Nominated by Visitor	Dr. Sharad Kumar Saraf (from 12.07, 2022 Dr. Pawan Goenka (upto July 11.07. 2022). Chairman, Technocraft Industries (India) Ltd. Technocraft Group, Bombay, Technocroft House, A-25 MIDC, Marol Industrial Area, Road No.3, Opp ESIC Hospital, Andheri (East), Mumbai – 400 093.	Chairman
Ex-officio	Prof. Subhasis Chaudhuri, Director, IIT Bombay, Powai, Mumbai – 400 076.	Member
Council Nominees (Four)	Dr. Rakesh Ranjan, Additional Secretary, Ministry of Education (TE), 118-C, Shastri Bhawan, New Delhi - 110015.	Member
	Prof. Aniruddha B. Pandit, U.G.C. Professor, Department of Chemical Engineering, Institute of Chemical Technology Bombay, Matunga, Mumbai - 400019.	Member
	Prof. Paresh K. Joshi, Room 106 NIUS Building, Homi Bhabha Centre for Science Education, TIFR, V.N. Purav Marg, Mankhurd, Mumbai -400088.	Member
State Government Nominees (Two)		
MAHARASHTRA State Nominee	Secretary, Higher and Technical Education Government of Maharashtra, Mantralaya, Mumbai – 400 032.	Member
DADRA AND NAGAR HAVELI State Nominee	Shri Praful K. Patel, Administrator, U.T. of Daman and Diu and Dadra and Nagar Haveli, Silvasa - 396 230.	Member
Senate Nominee	Prof. Virendra Sethi, Environmental Science and Engineering Department, IIT Bombay, Mumbai 400 076.	Member
Senate Nominee	Prof. Narayan Rangaraj, Industrial Engineering and Operations Research (IEOR), IIT Bombay, Mumbai - 400 076.	Member
Ex-officio	Mr. Ganesh Bhorkade, Registrar, IIT Bombay, Mumbai – 400 076.	Secretary

Members of the Finance Committee	
Dr. Pawan Goenka, MD and CEO, Mahindra and Mahindra, Mahindra Towers GM Bhosale Marg, Worli, Mumbai]	Chairman
Prof. Subhasis Chaudhuri, Director, IIT Bombay, Mumbai – 400 076.	Member (Ex-officio)
Dr. Rakesh Ranjan, Additional Secretary, Ministry of Education (TE), Department of Higher Education, Government of India, Shastri Bhavan, New Delhi – 110 015.	Member
Mr. Sandeep Asthana, B2-1101, Mahindra Eminente, Near Patkar College, S. V. Road, Goregaon (West), Mumbai – 400 062.	Member
Mr. Sanjog Kapoor, Joint Secretary and Financial Advisor, Ministry of Human Resource Development, Department of Higher Education, Technical Section-1, Government of India, Shastri Bhavan, New Delhi – 110 015.	Member
Prof. K. V. K. Rao, Dy. Director (Finance and External Affairs), IIT Bombay, Mumbai – 400 076.	Member
Mr. Ganesh Bhorkade, Registrar, IIT Bombay, Mumbai – 400 076.	Secretary (Ex-officio)

Members of the Building and Works Committee	
Prof. Subhasis Chaudhuri, Director, IIT Bombay, Mumbai – 400 076.	Chairperson
Superintending Engineer, Office of the Supdt. Engineer, Mumbai Central Circle-1, CPWD, 5th Floor, Pratishtha Bhavan, 101 MK Road, Mumbai – 400 020.	Member
Superintending Engineer, Mumbai (P.W.D) Circle, 25 Murzban Road, Fort, Mumbai – 400 001.	Member
Mr. K. Srinivas, Head, Architectural and Civil Engg. Division, BARC, North Site, Trombay, Mumbai – 400 085.	Member
Shri Vinod P. Chithore Chief Engineer, Vigilance, MCGM MCGM Vigilance Office, MTNL Exchange Road, Nityanand Nagar, Ghatkopar (West) Mumbai – 400086.	Member
Prof. Tom Mathew, Dean (Infrastructure Planning and Development), IIT Bombay, Mumbai – 400 076.	Member
Mr. Ganesh Bhorkade, Registrar, IIT Bombay, Mumbai – 400 076.	Member-Secretary (Ex-officio)

SUMMARY OF ACCOUNTS

CONSOLIDATED ACCOUNTS: BALANCE SHEET AS ON 31/03/2023

(Amount in Rupees)

Particulars	Schedule	Current Year 2022-2023	Previous Year 2021-2022
SOURCES OF FUNDS			
CORPUS/ CAPITAL FUND	1	4,75,44,79,267	3,03,75,14,848
DESIGNATED/ EARMARKED / ENDOWMENT FUNDS	2	9,96,13,62,399	11,10,02,15,269
CURRENT LIABILITIES AND PROVISIONS	3	26,23,83,75,572	25,59,96,66,321
TOTAL (A)		**40,95,42,17,238**	**39,73,73,96,438**
APPLICATION OF FUNDS			
FIXED ASSETS			
TANGIBLE ASSETS	4	10,06,81,72,746	4,77,41,38,055
INTANGIBLE ASSETS	4	14,47,61,368	26,70,48,809
CAPITAL WORKS-IN-PROGRESS	4	9,41,02,00,261	12,70,64,49,132
INVESTMENTS FROM EARMARKED/ ENDOWMENT FUNDS	5	1,75,69,64,079	3,27,92,95,132
INVESTMENTS OTHERS	6	1,30,00,00,000	2,03,00,00,000
CURRENT ASSETS	7	14,94,60,30,778	14,24,63,72,163
LOANS, ADVANCES AND DEPOSITS	8	3,32,80,88,006	2,43,40,93,147
TOTAL (B)		**40,95,42,17,238**	**39,73,73,96,438**
SIGNIFICANT ACCOUNTING POLICIES	24		

INCOME & EXPENDITURE FOR THE YEAR ENDED 31/03/2023

(Amount in Rupees)

Particulars	Schedule	Current Year 2022-2023	Previous Year 2021-2022
Income			
Academic Receipts	9	1,47,65,95,844	96,35,90,656.1
Grants/ Subsidies (Irrevocable Grants Received)	10	7,63,63,00,913	6,87,16,42,929
Income From Investments	11	90,02,74,926	88,44,32,322
Interest Earned	12	94,27,371	1,11,16,029
Other Income	13	76,55,92,558	57,60,29,130
Prior Period Income	14	25,40,550	1,22,522
Total (A)		**10,79,07,32,162**	**9,30,69,33,588**
Expenditure			
Staff Payments and Benefits (Establishment Expenses)	15	6,06,85,92,109	6,39,15,92,893
Academic Expenses	16	1,08,52,93,332	1,09,25,69,281
Administrative And General Expenses	17	1,60,89,98,484	1,28,21,84,606
Transportation Expenses	18	72,66,010	49,28,760
Repairs & Maintenance	19	58,59,78,652	37,34,24,622
Finance Costs	20	7,76,10,336	9,05,47,269
Other Expenses (Write-Off)	21	41,47,539	1,04,26,012
Prior Period Expenses	22	2,83,210	73,09,667
Depreciation	4	1,88,90,37,108	89,86,84,705
Total (B)		**11,32,72,06,780**	**10,15,16,67,815**
Balance Being Excess of Income Over Expenditure (A-B)		-53,64,74,618	-84,47,34,227
Adjusted from Capital Fund (Depreciation)		1,88,90,37,108	89,86,84,705
Adjusted from Capital Fund (Write-Off)		16,33,932	1,04,26,012
Transfer to Hefa		59,03,60,000	41,00,00,000
Transfer to Capital Fund (3 -C)		56,49,42,912	35,04,60,413
Transfer to General Reserve - Main Account		5,00,00,000	
Transfer to Ircc Fund		-34,77,63,838	-1,12,01,81,960
Transfer to General Reserve - Donation Account		19,61,94,398	25,53,53,813
Balance Being Surplus/ (Deficit) Carried to Corpus/ Capital Fund		30,04,62,950	16,87,44,224
Balance Being Surplus/ (Deficit) Carried to Corpus/ Capital Fund		-34,77,63,838	-1,12,01,81,960
Significant Accounting Policies	23		
Contingent Liabilities and Notes on Accounts	24		

Note : Deficit transferred to General Reserve Rs. 34,77,63,838 /- is on account of acturial value provision in r/o Leave Encashment, Gratuity and Pension

RECEIPT AND PAYMENT FOR THE PERIOD FROM 01/04/2022 TO 31/03/2023

(Amount in Rupees)

RECEIPTS	Amount	PAYMENTS	Amount
I. Opening Balances		**I. Expenses**	
a) Cash Balances	2,97,915	a) Establishment Expenses	4,34,96,01,313
b) Bank Balances		b) Academic Expenses	2640027402
i. In Current accounts	68,06,20,673	c) Administrative Expenses	1,42,66,69,825
ii. In Deposits accounts	0	d) Transportation Expenses	68,78,889
iii. Savings accounts	0	e) Repairs And Maintenance	54,54,22,893
		f) Prior Period Expenses	0
II. Grants Received		**II. Payments against Earmarked/ Endowment Funds**	60,62,064
a) From Government of India	8,30,50,00,913		
b) Grant in aid due in 2021 - 2022 received in 2022 - 2023	0		
c) From State Government	0		
d) From Other sources (details)	0		
III. Academic Receipts		**III. Payments against Sponsored Projects/ Schemes**	1,77,03,81,740
a) Fee from Students	1,03,73,96,341		
b) Other Receipts from Students	27,88,73,083		
c) All India Entrance Examination Receipts	16,47,63,290		
IV. Receipts against Earmarked/ Endowment Funds	14,10,78,259	**IV. Payments against Sponsored Fellowships/ Scholarships**	40,86,08,921
V. Receipts against Sponsored projects/ Schemes	2,73,33,96,045	**V. Investments and Deposits made**	0
		a) Out of Earmarked/ Endowments Funds	0
		b) Out of own funds (Investments - Others)	0
VI. Receipts against sponsored Fellowships/ Scholarships	36,31,22,624	**VI. Term deposits with Scheduled Banks**	18,97,37,52,090
VII. Income on investments from	0	**VII. Expenditure on Fixed Assets and Capital Works - in - Progress**	
a) Earmarked/ Endowment Funds	0	a) Fixed Assets	2,21,44,03,068
b) Other investments	0	b) Capital Works - in - Progress	24,50,88,502

RECEIPTS	Amount	PAYMENTS	Amount
VIII. Interest received on		**VIII. Other Payments including statutory payments**	3,09,96,65,415
a) Bank Deposits	1,42,03,91,684		
b) Loans and Advances			
c) Savings Bank Accounts			
d) Accrued Interest			
IX. Investments encashed	20,79,28,05,185	**IX. Refunds of Grants**	
X. Term Deposits with Scheduled Banks encashed		**X. Deposits and Advances**	
		a) Advances account	1,12,12,45,486
		b) Refundable Deposits	12,93,17,560
		c) Recoverable Deposits	1,66,40,300
XI. Other income (including Prior Period income)		**XI. Other Payments**	
a) Continuing Education programme	3,36,96,697	a) Grants from other organisations	1,32,09,62,866
b) Miscellaneous Receipts	20,44,51,840	b) Sundry Creditors	1,91,44,64,468
c) Guest House receipts	6,67,19,586	c) Loan - Inter Department	12,049
		d) Surplus transfer to Endowment	
		e) Other Payments - Main Account	40,37,88,872
		f) Other Payments - Donation Account	13,78,84,745
		g) Other Payments - IRCC Account	3,52,96,66,172
XII. Deposits and Advances		**XII. Closing balances**	
a) Advances account	1,47,41,484	a) Cash in hand	1,28,959
b) Refundable account	18,82,79,914	b) Bank balances	
c) Recoverable Deposits	3,00,000	Current Accounts	95,40,80,789
XIII. Miscellaneous receipts including Statutory receipts	83,02,76,114		
a) Other Adjustable Accounts			
XIV. Any Other Receipts			
a)Grants from other Organisations	1,92,52,31,972		
b) Sundry Debtors	3,98,99,62,457		
c) Loan - Inter Department			
d) Other Receipts - Main Account	1,19,06,826		
e) Other Receipts - Donation Account	3,88,82,398		
e) Other Receipts - IRCC Account	1,99,25,59,087		
TOTAL	**45,21,47,54,387**	**TOTAL**	**45,21,47,54,387**

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

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