

Hon'ble President Of India Smt. Droupadi Murmu Dedicates Anti-Cancer CAR-T Cell Therapy to The Nation



Hon'ble President of India Smt. Droupadi Murmu addressing the audience

Hon'ble President of India **Smt. Droupadi Murmu** dedicated the new anti-Cancer CAR-T cell therapy NexCAR19 to the nation in the presence of the Hon'ble Governor of Maharashtra **Shri Ramesh Bais**, Guest of Honour; former IIT Bombay Director **Prof. Subhasis Chaudhuri**; Director of Tata Memorial Centre **Prof. Sudeep Gupta**; key contributors led by **Prof. Rahul Purwar**, Department of Bioscience and Bioengineering, IIT Bombay; **Dr. Hasmukh Jain** and **Dr. (Surg Cdr) Gaurav Narula** from the Tata Memorial Centre, Mumbai, among many others on April 4, 2024. A few cancer survivors who were successfully treated with CAR-T cell therapy were also present.

Appreciating the team efforts of IIT Bombay, Tata Memorial Centre and ImmunoACT in making CAR-T therapy available to people, the Hon'ble President of India **Smt. Droupadi Murmu**, in her address said, "*CAR-T cell therapy is considered to be one of the most phenomenal advances in medical science. It has been available in developed nations for some time, but it is extremely costly and beyond the reach of most patients around the world. What is new about the therapy being launched today, as I understand it, is that it costs 90 per cent less than what is available elsewhere. This is the world's most affordable CAR-T cell therapy. Moreover, it is also an example of the 'Make in India' initiative; a shining example of the Atmanirbhar Bharat*".



Prof. Subhasis Chaudhuri, former Director of IIT Bombay, felicitating Hon'ble President of India Smt. Droupadi Murmu

Congratulating the key contributors, the Guest of Honour, Hon'ble Governor of Maharashtra **Shri Ramesh Bais** in his address said, *"In any advanced country, academia-industry collaboration is the key cornerstone. Academia leads in R&D, especially in basic sciences. These R&D provide potential breakthrough applications*



Prof. Subhasis Chaudhuri, former Director of IIT Bombay, felicitating Hon'ble Governor of Maharashtra Shri Ramesh Bais

which need to be translated for commercialization by the industry. The collaboration between the academic institutes of IIT Bombay, Tata Memorial Hospital with industry partners like SINE, Laurus and others is a sterling example on how this can be achieved with benefits to all parties concerned”.

“Cell and gene therapy will be an important aspect of it from treating cancers, to genetic disorders like sickle cell anemia and many other challenges that come with the ageing population. Not only do we have to ensure that we are able to innovate and provide the best technology to our population but also do it in a way where all segments of the society can access it,” he added.

Speaking on this momentous occasion, the Director of Tata Memorial Centre **Dr. Sudeep Gupta** said, “The collaboration between IIT Bombay and Tata Memorial Centre to develop the first indigenous CAR-T cell therapy product has been extremely fruitful and satisfying. This CAR-T cell therapy product will save many lives at much lower cost compared to the cost of such products available outside India. We hope that in years to come, our collaboration will lead to the development of other Cell and Gene Therapy products that will help our patients with various cancers”.

The Institute’s former Director **Prof. Subhasis Chaudhuri**, in his address, said, “The low-cost CAR-T cell therapy is a huge achievement for our country and cancer patients in India and it places India firmly on the global map of cell and gene therapy. He said that we can take pride in the fact that India is now one of the very few countries in the world that can make its own gene therapy for treating cancer. This is a testament to the efforts of several scientists, doctors, nurses and others who worked together relentlessly over the last decade to achieve this goal for our patients”.

The programme was attended by IIT Bombay students, faculty members, the team from Tata Memorial Centre, ImmunoACT and other dignitaries in large numbers.

The entire event was also broadcast live on the YouTube: <https://www.youtube.com/IITBombayOfficialChannel>

About CAR-T Cell Therapy: NexCAR19 CAR-T therapy is India’s first indigenously ‘Made-in-India’ CAR-T therapy; borne from the academia-industry partnership. NexCAR19 is the world’s most affordable CAR-T therapy and it puts India firmly on the global map of advanced cell and gene therapy. The CAR-T cell therapy has been developed by Prof. Rahul Purwar and his team at the BSBE Department, IIT Bombay in close association with Tata Memorial Centre and ImmunoACT.

About ImmunoACT: Spun out from IIT-Bombay in 2018, ImmunoACT is India’s pioneer in the development of the country’s first indigenous Cell & Gene Therapy. With a rapidly expanding pipeline beginning with blood cancers, our mission is to provide affordable access to novel autologous CAR-T cell therapies.



Dignitaries from IIT Bombay, Tata Memorial Centre and ImmunoACT with Hon'ble President of India Smt. Droupadi Murmu (Center) and Hon'ble Governor of Maharashtra Shri Ramesh Bais (seated second from Left)

IIT Bombay Holds Commencement 2024



Chief Guest Mr. Natarajan Chandrasekaran addressing the audience

IIT Bombay held **Commencement 2024** at the Institute's Convocation Hall on May 3, 2024. Mr. Natarajan Chandrasekaran, the Chairman of Tata Sons, the holding company and promoter of all Tata Group companies, graced the ceremony as the Chief Guest and delivered the Commencement address in the presence of the former Institute Director **Prof. Subhasis Chaudhuri**.

Commencement, similar to a traditional convocation ceremony, is a special event to be conducted once every year to gather all students likely to graduate.

The Chief Guest **Mr. Natarajan Chandrasekaran** in his address spoke about three fundamental aspects – Trust, Character and Purpose that determine success in the journey of building a career. He said, *"Building and cultivating trust is very essential to your success. When an organisation and its colleagues trust you, they not only empower you but also embrace you. Secondly, Character is your capacity to prioritize your values over your instincts. It will enable you to be true to your principles. While trust and character will help you to be successful in your career, the purpose that you live for will inspire and guide you and give you fulfillment"*.

Presenting the Institute's Report for the year 2023-24, **Prof. Subhasis Chaudhuri**, former Director of IIT Bombay informed that IIT Bombay continues to be the top-ranked university in the country and among the best in the world.

Wishing the graduating students the best in life, **Prof. Chaudhuri** said, *"The quality of education you have received at IIT Bombay is second to none in the world but what you have learnt is only a foundation – putting up a structure on the foundation is your responsibility. Further, please remember that you all were privileged to have had your education at IIT Bombay and our nation has great expectation from each one of you"*.

IIT Bombay introduced a 'Commencement' event last year so that the students celebrate their journey through IIT Bombay along with all their batch-mates and family members while they embark on a new phase in their lives.



Former Director of IIT Bombay Prof. Subhasis Chaudhuri addressing the students

In the afternoon session, about 2489 students who are likely to graduate, were invited for a photo opportunity with the Director on the dais. The students include (approx) 1249 undergraduates, 1005 postgraduates and 235 PhDs.

Members of the Board of Governors attended the Commencement 2024, besides the graduating students and their parents.

The function was broadcast live on: <https://www.youtube.com/c/IITBombayOfficialChannel>



Students taking pledge during Commencement 2024

Prof. Shireesh B. Kedare Takes Charge As The New Director Of IIT Bombay

The Government of India has appointed **Prof. Shireesh B. Kedare**, Department of Energy Science and Engineering, IIT Bombay as the new Director of IIT Bombay. Prof. Kedare assumed charge as Director on May 6, 2024.

Prof. Kedare, an alumnus of IIT Bombay, completed his B.Tech. and Ph.D. in Mechanical Engineering in 1985 and 1992 respectively. He is an Institute Chair Professor in the Department of Energy Science and Engineering and has served as an Adjunct Professor from 2001 to 2013 and a Professor since May 2013.

Prof. Kedare has held various significant positions in the Institute, other institutes and industries, including the first Professor-in-Chargeship of Centre of Excellence in Oil, Gas and Energy (CoE-OGE), IIT Bombay. He currently is a nominated Member of the Council of IITs, Ministry of Education; a Member of Board of Governors (BoG), IIT Madras among many more.

He has received several awards recognizing his research and teaching excellence, including the Department Award for Excellence in Teaching and Dr. P.K. Patwardhan Technology Development Award. He is a Life Member of Solar Energy Society of India (SESI). He has five patents, published 64 journal papers, 50 conference papers and a Scopus h-Index of 23. He has guided 12 PhDs till date.



Former Director Prof. Subhasis Chaudhuri (Department of Electrical Engineering) handing over charge to Prof. Shireesh Kedare

Celebration Of World Environment Day

On June 5, 2024, IIT Bombay observed **World Environment Day** by conducting cleanliness drives and an awareness campaign in coordination with Dean (Infrastructure Planning and Support) Office, Estate Office, Public Health Office, National Service Scheme (NSS) IIT Bombay, Abhyudaya and Team Shunya on campus.

KV School students also joined in a nature walk. The Public Health Officer interacted with the students and stressed the importance of preserving our environment. Various initiatives including a zero-food waste drive in the hostel messes was observed.

The Environmental Science and Engineering Department (ESED) at IIT Bombay, in collaboration with the Institution's Innovation Council (IIC), organised a virtual talk by **Dr. Sanat Kumar Saha**, Emeritus Professor at KIIT, a former member of the West Bengal State Council of Higher Education and a distinguished environmentalist, educationist and philanthropist.

Dr. Saha delivered an enlightening presentation on **“Energy Security and Environmental Protection: An Indian Perspective,”** emphasizing the need for global cooperation in addressing environmental challenges. He covered topics such as waste-to-energy conversion, air and water pollution and highlighted the importance of international environmental policies. The Head (ESED) **Prof. Subhankar Karmakar** moderated the talk along with **Prof. Indrajit Chakraborty**.

Dr. Saha's presentation underscored the urgency of environmental conservation and energy security at both national and global level.



IIT Bombay Ranked 118th Globally In The QS WUR 2025



The **Indian Institute of Technology Bombay** has been **ranked 1st in India** and has moved significantly up from 149th rank last year to **118th rank in the Quacquarelli Symonds (QS) World University Rankings 2025**, with an overall score of 56.3 out of 100. It is for the first time ever since its participation that IIT Bombay has been ranked within top 125 in QS rankings. Overall, the Institution improved its 2024 performance by 31 places.

The results were released on June 4, 2024, by QS. The Institute has a score of 86.0 in employer reputation, 79.1 in citation per faculty, 58.5 in academic reputation, 64.5 in employment outcome, 52.5 in sustainability, 14.4 in faculty-student ratio, 4.3 in international faculty, 52.3 in international research network and 1.3 in international students, all scores out of a maximum of 100 points. Among these nine parameters, Employer Reputation indicated the strongest one for IIT Bombay with a rank of 63 globally.

IIT Bombay has been ranked **45th in Engineering and Technology** with an overall score of 79.1 out of 100 in the **Quacquarelli Symonds (QS) World University Rankings by Subject for 2024**. The Institute has been ranked in 4 out of 5 broad subject areas, which include Engineering and Technology, Natural Sciences, Social Sciences and Management, and Arts and Humanities. The Institution improved on its 2023 performance by two places in Engineering and Technology. The results were released on April 10, 2024, by QS, a British company.

The Institute has been ranked 64th for Computer Science and Information Technology, 30th in Data Science and Artificial Intelligence, 42nd for Civil and Structural Engineering, 64th for Chemical Engineering, 63rd for Electrical and Electronics Engineering, 57th for Mechanical, Aeronautical and Manufacturing Engineering and 25th for Minerals and Mining.

Following are the parameter-wise scores earned by the Institute:

- * Best performance in Mathematics with a score of 79.6 in Academic Reputation
- * Best performance in Engineering–Mineral and Mining with a score of 96.2 in Employer Reputation
- * Best performance in Engineering–Mineral and Mining earning the highest score-88.0 in Citations per Paper
- * Highest-scoring subject in Engineering–Mineral and Mining earning score of 80.5 in H-Index indicator

The QS World University Rankings by Subject identifies the world's strongest universities in individual subject areas, covering 55 disciplines as of 2024.

IIT Bombay Receives INFORMS Franz Edelman Finalist Award

IIT Bombay team and **Tata Steel, India**, received the **2024 INFORMS Franz Edelman Finalist Award** during the Edelman Gala night at INFORMS Business Analytics Conference 2024, Orlando, USA, held on April 15, 2024.



IIT Bombay Celebrates International Day Of Yoga 2024



Prof. Shireesh Kedare, Director of IIT Bombay, felicitating Chief Guest Prof. K. Satya Lakshmi, Director of the National Institute of Naturopathy, Pune

IIT Bombay organised the global celebration of the **10th International Day of Yoga (IDY)** with various events designed to promote physical, mental and spiritual well-being on June 21, 2024. These events witnessed robust involvement from students, faculty, staff and their families, underscoring IIT Bombay's dedication to fostering a healthy and balanced lifestyle.

The day began at 6:30 am with a 45-minute Common Yoga Protocol (CYP) drill, a globally renowned yoga program that consistently remains the core of International Day of Yoga celebrations. The Director of IIT Bombay **Prof. Shireesh Kedare** along with other Deans, Registrar and officials attended the programme at the indoor badminton court of Gymkhana on the IIT Bombay campus.

The IDY-2024 festivities at IIT Bombay were further elevated by the esteemed presence of **Prof. K. Satya Lakshmi**, Director of the National Institute of Naturopathy, Pune, who graced the occasion as the Chief Guest. In the evening, Yogastha hosted their flagship event "*The Yogathon Challenge*" featuring 108 rounds of Surya Namaskar, marking the culmination of a series of preparatory Surya Namaskar sessions that began two weeks before June 21.

On this remarkable occasion, the core members of Team Yogastha, the dedicated student body of IIT Bombay, were honoured with Yoga Volunteer certificates from the Ministry of Ayush, Government of India. Yogastha and Civil Engineering Association (CEA), IIT Bombay also organised a workshop on



Team Yogastha felicitated during International Day of Yoga celebrations at IIT Bombay



Participants performing yoga asanas during International Day of Yoga celebrations at IIT Bombay

“Yoga, Spirituality, and Indian Mysticism” by **Prof. Swami Vedajnananda-ji Maharaj** on June 16, 2024.

On May 2, 2024, Yogastha kicked off a grand 50-day celebration chasing up to the IDY. The festivities commenced with a mini-Yogathon challenge, where participants were tasked with completing 54 continuous rounds of Surya Namaskar. This initial event along with the regular morning yoga practices, set the stage for the subsequent 50 days filled with enriching yoga-related activities.

The International Day of Yoga (IDY) 2024 series featured diverse workshops on topics such as Surya Namaskar, the sequential flow of stretching, the benefits of stretching before performing asanas, Tratak kriya, Yog Nidra, pranayama techniques and empowering women through yoga with a focus on hormonal balance. Additionally, Yogastha hosted a five-day yoga camp to guide participants in establishing a weekly yoga routine. These meticulously planned activities made the International Day of Yoga 2024 a memorable and impactful celebration at IIT Bombay.

Two-day Joint Workshop On Quantum Technologies

IIT Bombay and the **University of Chicago** held their inaugural kick-off meeting at the U-Chicago Center in New Delhi, marking the beginning of their collaborative efforts. IIT Bombay is now an international partner of the prestigious Chicago Quantum Exchange (CQE), which is an intellectual hub for the science and engineering of quantum information, anchored by the University of Chicago, Argonne National Laboratory, Fermi National Accelerator Laboratory, the University of Illinois Urbana-Champaign, the University of Wisconsin-Madison and Northwestern University.



Participants during the technical discussions on various quantum technologies

The two-day workshop saw participation from faculty and students at both institutes, along with invited members from the Tata Institute of Fundamental Research (TIFR), industry representatives from companies like Applied Materials, IBM, C-DoT and TCS and delegates from the Department of Telecommunications (DoT).

The two-day meeting, with a welcome note from the Director of IIT Bombay **Prof. Shireesh Kedare**, featured in-depth technical discussions on various quantum technologies and explored potential areas of collaboration. Participants deliberated on the logistics of their partnership, including the establishment of student exchange programs, workshops and summer schools. They also addressed the challenges associated with intercontinental exchanges, proposing potential action items. Additionally, there were discussions on creating a larger ecosystem in collaboration with industry and government agencies, which included participation from Society for Innovation and Entrepreneurship (SINE) and Research Park of IIT Bombay.

SANGAM Conference 2024 Held At IIT Bombay



Prof. Sarthak Gaurav welcoming the guests during the SANGAM conference

IIT Bombay hosted the second edition of the **Summit of Academia Networking with Government, Allied Health Workers, and Medical Professionals (SANGAM)**, a two-day International Health Conference, during April 20-21, 2024 at the Institute campus. The event was organized in partnership with the **Maharashtra University of Health Sciences (MUHS)**. **Prof. Sarthak Gaurav**, Shailesh J. Mehta School of Management, was the Conference Chair.

The conference saw the participation of 20 speakers and more than 200 registrants from all over the country as well as from international institutions. The event brought together leading experts, innovators and policymakers from diverse sectors to discuss and share ideas on the latest trends and challenges in public health focusing on four key themes: (a) Medical Devices (b) AYUSH (c) Mental Health and (d) AI and Digital Healthcare.

The inaugural session was graced by Chief Guest **Mr. Luigi D'Aquino**, Chief of Health, UNICEF India;

Lt. Gen Madhuri Kanitkar (Retd.), Vice Chancellor, Mumbai University of Health Sciences (MUHS); **Prof. Karbhari B. Kale**, Vice Chancellor, Dr. Babasaheb Ambedkar Technological University, Lonere; **Prof. S. Sudarshan**, Deputy Director (Academic and Infrastructural Affairs), IIT Bombay; **Ms. Sujata Saunik**, Takemi Fellow and Additional Chief Secretary (Department of Home Affairs), Government of Maharashtra, among many others.

From insightful discussions on Ayurveda's resurgence and the latest advancements in medical devices to thought-provoking talks on mental health and the integration of AI in healthcare and the forefront of vaccine development, every session was brimming with knowledge and inspiration.

The event concluded successfully with participants receiving a unique opportunity to engage with dynamic panels and networking opportunities, fostering meaningful connections and driving impactful conversations.

Inauguration Of Department Of Industrial Engineering And Operations Research



Glimpses of Department of Industrial Engineering and Operations Research inauguration event

On April 24, 2024, IIT Bombay formally inaugurated the **Department of Industrial Engineering and Operations Research** and also launched a **B.Tech Programme in IEOR** as part of IEOR Symposium 2024.

Prof. Subhasis Chaudhuri, former Director of IIT Bombay, unveiled the new Department's name board whereas **Prof. Avinash Mahajan**, Dean (Academic Programmes) shared his thoughts on the newly launched B.Tech program in IEOR. The event brought together faculty, mentors and students both in person and online to celebrate this momentous occasion.

The Symposium commenced with a warm welcome address by HoD **Prof. Jayendran Venkateswaran**. The highlight of the symposium was the keynote address delivered by **Prof. Manoj K. Tiwari**, Director of the Indian Institute of Management, Mumbai and Vice Chancellor of Tata Institute of Social Sciences.

Prof. Tiwari's insightful speech shed light on the significance of research in industrial engineering and operations management, leaving the audience enthralled.

The Symposium also featured engaging talks by industry stalwarts, including **Ms. Goda Ramkumar**, Vice President of Data Science at *Swiggy*, who shared her expertise on the applications of optimization in business.

The event concluded with a felicitation ceremony honouring **Prof. Prakash G. Awate** and **A. Subhash Babu**, the founding faculty members of the academic area of Industrial Engineering and Operations Research at IIT Bombay for their invaluable contributions to the Department.

Following the Symposium, attendees had the opportunity to explore the ongoing research projects through poster presentations by PhD and MTech students. The presentations provided a glimpse into the cutting-edge research being conducted within the Department, fostering collaboration and knowledge exchange among the attendees.

The IEOR Symposium 2024 was indeed a confluence of ideas and innovations, serving as a platform for academia and industry to come together and chart the path for future advancements in the field of industrial engineering and operations research.

MoU With BFI To Promote Healthcare Innovation

IIT Bombay signed a Memorandum of Understanding with **Blockchain for Impact (BFI)** for catalysing and promoting healthcare innovation to improve public health in India.

The BFI-Biome network aims to build conversations, formulate ideas and partnerships for collaborative projects in cutting-edge healthcare solutions in life sciences as well as enhance the public healthcare sector in India.

This initiative aims to bridge the gap between research and implementation by funding medical research, startups and training programs under their BFI-Biome Network.

The MoU signing event was attended by dignitaries from IIT Bombay and BFI, including **Dr Gaurav Singh**, CEO, Blockchain for Impact and **Prof. Ravindra D. Gudi**, Dean (Alumni and Corporate Relations), IIT Bombay.

The MoU signing strengthens IIT Bombay's commitment to support, accelerate and forge multisectoral collaboration to address the gap between R&D, innovation and implementation in the healthcare and life science sector.



MoU signing ceremony was held at IIT Bombay

MoU To Establish WRCB-HiMedia Bioinnovation Centre



Several officials attended the MoU signing ceremony held at IIT Bombay

IIT Bombay and **HiMedia Laboratories Pvt.** have signed an MoU to establish the **Wadhvani Research Centre for Bioengineering (WRCB) - HiMedia Bioinnovation Centre** to promote research and entrepreneurship in healthcare and life sciences.

The WRCB-HiMedia Bioinnovation Centre will promote impactful translational research projects in healthcare and life sciences at IIT Bombay targeted at post-doctoral fellows, graduating PhDs, staff

scientists and researchers to explore their ideas for commercialization.

The MoU signing event was attended by **Dr. Vishal G. Warke**, Director-HiMedia Laboratories, **Dr. Rahul Joshi**, Global Sales Head - HiMedia, **Prof. Ravindra D. Gudi**, Dean (Alumni and Corporate Relations), **Dr. Abdur Rub**, CEO - WRCB along with key attendees **Prof. Debjani Paul**, Professor-In-Charge-WRCB and **Prof. Abhijit Majumder** (Department of Chemical Engineering, IIT Bombay).

IIT Bombay-Citadel Securities Collaborate For Quantitative Research Lab

IIT Bombay is proud to announce its collaboration with **Citadel Securities** to establish the **IIT Bombay - Citadel Securities Quantitative Research Lab** at the Institute's upcoming Centre for Research in Financial Markets.

The IITB-Citadel Securities Quantitative Research Lab will conduct research across diverse areas of finance, including the application of

mathematical and statistical methodologies in finance and risk management, as well as technological innovation in banking and financial markets. It will also facilitate relevant academic programmes for all students at the undergraduate, postgraduate and post-doctoral levels along with collaboration with banks and financial service companies to create tailored educational and research programmes for students to gain real-world experience and contribute to the field.

The MoU signing ceremony was attended by **Prof. Subhasis Chaudhuri**, former Director of IIT Bombay; **Mr. Jatin Phutela**, Managing Director and COO-India for Citadel Securities; **Prof. Ravindra D. Gudi**, Dean (Alumni and Corporate Relations), IIT Bombay; **Prof. S.V.D. Nageswara Rao**, Head of Shailesh J. Mehta School of Management, IIT Bombay and **Mr. Anand Kumar Sinha**, Head of Systematic Business, APAC for Citadel Securities.



Dignitaries from IIT Bombay and Citadel Securities during MoU signing ceremony

MoU To Establish 'Arun Firodia Research Floor'



Mr. Arun Firodia, Chairman, Kinetic Group (Center) and Prof. Subhasis Chaudhuri, former Director (third from Left) along with IIT Bombay functionaries during the launch of 'Arun Firodia Research Floor'

IIT Bombay has signed a Memorandum of Understanding (MoU) with its Distinguished Alumnus **Mr. Arun Firodia** (BTech, Electrical Engineering, 1965), Chairman, **Kinetic Group**, for supporting strategic initiatives as a part of the Institute's journey of excellence. The Institute will utilize these funds to undertake the expansion of its infrastructure and research activities.

Additionally, this collaboration will establish a **Chair Professorship in Mobility and Electronics**, solidifying IIT Bombay's leadership in research and education in this domain. Through industry collaboration, student engagement and research advancements, we aim to drive innovation and excellence in Mobility and Electronics.

Expressing gratitude, the Institute has dedicated '**Arun Firodia Research Floor**' to furthering research in Electrical Engineering. Mr. Firodia's contributions stand as a testament to the pivotal role that alumni continue to play in the Institute's pursuit of excellence.

IIT Bombay Unveils The Nation's First-Of-Its-Kind GMP Facility

The **10X GMP Facility at IIT Bombay** is the **first-of-its-kind in India** and will help to manufacture products for human trials. This facility will encourage researchers to manufacture breakthrough products in healthcare which are 10 times cheaper, better or faster than anything currently available. This will make treatment of complex diseases like types of Cancer, much more affordable without any compromise on quality and efficacy.

IIT Bombay has a strong pipeline of products awaiting the launch of this GMP. Researchers from IIT Bombay showcased breakthrough treatment solutions based on their cutting-edge research which have gone past animal trials.

This technologically sophisticated GMP has many unique features. It is flexible enough to accommodate a product change every few weeks. While it provides top-of-the-line sterility, the biosafety level can also be flexibly changed to suit the concerned product requirements. As many as four independent products can be simultaneously manufactured in this GMP without risk of cross-contamination. It will also be a partnership opportunity for small and medium-sized Pharma companies which can use this facility because it may not be viable for them to set up and operate such a complex facility on their own.

To learn more about this groundbreaking facility:

<https://www.youtube.com/watch?v=7z9Z4gMoJs0&t=458s>



Distinguished Alumnus Mr. Raj Nair

The establishment of this facility has been funded and programme managed by **Mr. Raj Nair**, a Distinguished Alumnus (B.Tech., 1971, Metallurgical Engineering) of IIT Bombay and Chairman of *Avalon Consulting, Germinait Solutions and AGR Knowledge Services*

Sharing his vision for the Centre, he said, *"The 10X GMP facility has been set up to encourage brilliant researchers at IIT Bombay to aim for breakthroughs that are 10 times cheaper, better, or faster than all known treatments. I believe only that can move the needle for society. The availability of a BSL3 GMP facility on the campus also helps reduce the cost of manufacturing products for human trials and shorten the time it takes to get life-saving solutions to the market. I envision a day in the near future when researchers at IIT Bombay will provide millions of people, with a continual flow of solutions to major*



Prof. Jayesh Bellare speaking during the symposium

human problems ranging from Alzheimer's to cancer, from drug-resistant TB to COVID-19, etc., and all that at a fraction of the cost of treatment available in other parts of the world".

Mr. Ajit Jawle, Chairman of *Knexir Consultants Pvt Ltd* and an esteemed alumnus of IIT Bombay, deserves special recognition for his unwavering dedication to and huge contribution to designing and overseeing every aspect of bringing this unique facility to fruition.

The inauguration ceremony was graced by eminent personalities from both industry and academia, underscoring the significance of this endeavour. Chief Guest **Dr. C. S. Pramesh**, Director of the *Tata Memorial Hospital*; Guest of Honour Padma Shri **Mr. Dr. Raman Gangakhedkar**, former Dr. CG Pandit

National Chair, *Indian Council of Medical Research* and **Dr. G S Bhuvaneshwar**, Adjunct Professor at *IIT Madras* were among the esteemed dignitaries who honoured the occasion with their presence. The Institute was represented by **Prof. Subhasis Chaudhuri**, former Director, **Prof. Ravindra D. Gudi**, Dean (Alumni and Corporate Relations) and **Prof. P. V. Balaji**, Head of the Department of Biosciences and Bioengineering.

A symposium on "**World Class MedTech Manufacturing through Good Manufacturing Practice (GMP) and Quality Management System (QMS)**" was also organised on the occasion, providing a platform for health experts from academia and industry to exchange ideas and insights.

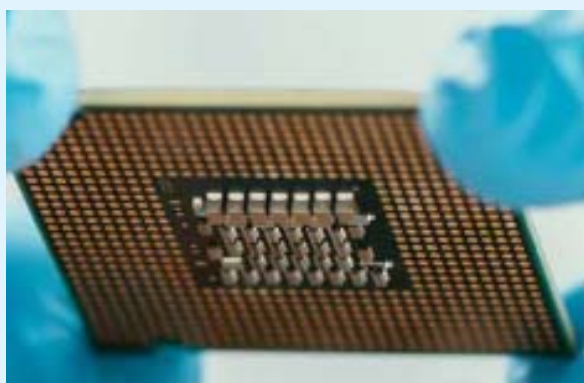


Institute Holds Dhrupad Rudraveena Concert



IIT Bombay, in honour of the late **Ustad Zia Fariduddin Dagar**, organised a **Dhrupad Rudraveena Concert** in honour of his enormous contributions to the field of music education at the Institute on May 11, 2024. A portrait of the late Ustad Zia Fariduddin Dagar was also unveiled by his nephew and artist **Ustad Mohi Bahauddin Dagar** on the occasion.

IIT Bombay And TCS To Build India's First Quantum Diamond Microchip Imager



- The Quantum Diamond Microchip Imager, an advanced sensing tool for semiconductor chip imaging, will help reduce chances of chip failures and improve efficiency of electronic devices
- Collaboration between IIT Bombay and TCS to develop a quantum imaging platform for the non-destructive examination of chips is the first such initiative in India
- Project aligned with the Government of India's National Quantum Mission – an initiative to position the nation as a global quantum technology leader

The **Indian Institute of Technology Bombay** (IIT Bombay) has entered a strategic partnership with the **Tata Consultancy Services** (TCS) (BSE: 532540, NSE: TCS), a global leader in IT services, consulting and business solutions, **to develop India's first Quantum Diamond Microchip Imager**. This advanced sensing tool will hold the potential to unlock new levels of precision in the examination of semiconductor chips, reduce chip failures and improve the energy efficiency of electronic devices.

Over the next two years, experts from TCS will work with Prof. Kasturi Saha, Department of Electrical Engineering, IIT Bombay to develop the quantum imaging platform in the PQuest Lab. This platform will enable better quality control of semiconductor chips, thereby improving product reliability, safety and energy efficiency of electrical devices. Semiconductor chips are an essential component of all modern electronic devices, making them smart and efficient. With the ability to process data and complete tasks, these chips act as the brain of devices across industries such as communications, computing, healthcare, military systems, transportation, clean energy and more.

Prof. Kasturi Saha, Department of Electrical Engineering, IIT Bombay said, *"PQuest group at IIT Bombay is excited to collaborate with TCS on developing a quantum imaging platform for the non-destructive examination of chips, leveraging our extensive expertise in quantum sensing to drive innovation. By working together, we aim to transform various sectors, including electronics and healthcare and propel India forward through groundbreaking technologies and products aligned with National Quantum Mission's Quantum Sensing and Metrology vertical"*.

Dr. Harrick Vin, Chief Technology Officer, TCS, said, *"The Second Quantum Revolution is progressing at an unprecedented speed, making it imperative to pool our resources and expertise to build cutting-edge capabilities in sensing, computing and communication technologies. Our collaboration with IIT Bombay is perfectly aligned with the National Quantum Mission's Quantum Sensing and Metrology vertical. We firmly believe this initiative*

will have a transformative impact on various industries and society, with applications ranging from electronics to healthcare and beyond. By working together, we can drive innovation and create a brighter future for all".

The collaboration between TCS and IIT Bombay is aligned with the National Quantum Mission – an initiative by the government of India to position the nation as a global quantum technology leader. An indigenous Quantum Diamond Microchip Imager that integrates quantum diamond microscopy with AI/ ML-powered software imaging will help India leap ahead in the Quantum Revolution.

Prof. Shireesh Kedare, Director, IIT Bombay said, *"IIT Bombay is happy to announce this collaborative initiative with TCS to develop a quantum imaging platform for the non-destructive examination of chips. IIT Bombay has a wide and deep pool of expertise in different critical domains and we are keen to collaborate with industry to translate the ideas, innovations and research into the technologies and products through such collaborations as well as startups that will take India ahead"*.

As semiconductors continue to shrink in size, traditional sensing methods lack the precision and capabilities to detect anomalies in the chips. The Quantum Diamond Microchip Imager can image magnetic fields, enabling a non-invasive and non-destructive mapping of semiconductor chips, much like an MRI at a hospital. It uses the defects in a diamond's structure, known as Nitrogen-Vacancy (NV) centers, together with the other hardware and software for detecting and characterizing anomalies in semiconductor chips. These diagnostic capabilities will have significant implications for failure analysis, device development and various optimization processes.

This project builds on TCS and IIT Bombay's dynamic partnership since the 1990s, spanning joint research projects, collaborative education programs, internships, faculty development programs and more. Notably, IIT Bombay was the first institute to be signed as an academic partner for TCS' Co Innovation Network (COIN), a platform driving industry-academia collaboration for pioneering solutions.

IIT Bombay Launches Gogri Hub For Membranes Research



The launch event was graced by members of the Gogri family and experts from industry and academia

The **Gogri Hub for Membranes Research**, a Unit of Translational Research Centre - Chemicals and Materials, IIT Bombay was launched on April 23, 2024. The Hub has been set-up through the generous support of the Gogri family, which includes IIT Bombay alumni **Mr. Mirik Gogri** (*Dual Degree, Metallurgical Engineering, 2013*) and **Mr. Renil Gogri** (*B.Tech., Mechanical Engineering, 2008*). The Hub will focus on developing groundbreaking solutions in field of membrane research, science and technology.

The Gogri Hub for Membranes Research aims to propel the advancement of membrane technologies from laboratory prototypes to pilot-scale solutions, addressing critical global challenges such as enhancing access to clean water, improving healthcare delivery and promoting sustainable energy and environmental practices. The Hub hopes to achieve this by fostering active collaboration among researchers, innovators, industry leaders and investors, driving the translation of cutting-edge research into practical, impactful solutions. The key focus areas of work include technologies for water and wastewater treatment, biomedical applications and the energy sector.

The launch event was graced by members of the Gogri family and experts from industry and academia. In attendance were Chief guest **Dr. Kannan Srinivasan**, Director - CSMCRI, CSIR; Guest of Honour **Dr. S. Sridhar** - Chief Scientist, Membrane Separations Lab; **Dr Adil Dhalla**, Managing Director - Start Centre and Singapore Membrane Consortium; **Mirik Gogri and Renil Gogri**. The Institute was represented by **Prof. Subhasis Chaudhuri**, former Director, **Prof. Ravindra D. Gudi**, Dean (Alumni and Corporate Relations), **Mr. Rajesh Gopinathan**, Professor of Practice and Head of Translational Research and Entrepreneurship, **Prof. Swatantra Singh**, Environmental Science and Engineering Department.

The event also included two panel discussions, where they explored the themes of "*Indigenisation and Sustainability of Membranes in Healthcare and Water*" and "*Potential of Membrane Technologies in India in the Energy and Separation Sector*".

Watch the event here:

<https://www.youtube.com/watch?v=4erDNN7Es0w>



IIT Bombay Hosts International Delegates



Prof. Shireesh Kedare met delegates from France

IIT Bombay hosted a delegation from **École Polytechnique, France**. Prof. Shireesh Kedare, Director of IIT Bombay, along with Prof. K.V.K. Rao, Deputy Director (Finance and External Affairs) and Prof. Sudarshan Kumar, Dean (International Relations) met the Prof. Dominique Rossin, Provost of École Polytechnique, Ms. Gaëlle Le Goff, Director of International Affairs and Mr. Paul Forien, Deputy Director of International Affairs.

The positive discussions focused on the development of a collaborative relationship between the two premier institutes. The delegation also visited Society for Innovation and Entrepreneurship (SINE) and Centre for Machine Intelligence and Data Science (C-MInDS) in IIT Bombay.



Consulate General of France in Mumbai Dr. Philippe Maurin, Science and Higher Education Attache visited IIT Bombay on March 27, 2024.

Dr. Maurin met Prof. Sudarshan Kumar, Dean (International Relations) and Prof. Krishna P. Kaliappan, Dean (Strategy) to discuss steps to enhance cooperation between IIT Bombay and universities in France.



University of Houston, USA at IIT Bombay



Alderman Professor Michael Mainelli, FCCA, FCSI(Hon) FBCS, Lord Mayor of the City of London 2023-24 visited IIT Bombay on February 15, 2024. At IIT Bombay, **Prof. S Sudarshan**, Deputy Director (Academic and Infrastructural Affairs); **Prof. Sudarshan Kumar**, Dean (International Relations) and **Prof. Sachin Patwardhan**, Dean (Research and Development) interacted with Prof. Mainelli.

This was an great opportunity for UK and Indian education leaders to deliberate, exchange ideas and approaches to internationalization and establish research innovation and academic partnerships.

Students News



Ms. Amreen Khan, a Ph.D. student at the Centre for Research in Nanotechnology and Science (CRNTS), has been awarded for outstanding research under PhD category by the Society for Biomaterials, USA 2024. She was selected for her research on developing innovative biomaterials for cancer theranostics and wound healing under the guidance of **Prof. Rohit Srivastava** (Department of Biosciences and Bioengineering), **Prof. Jayesh Bellare** (Department of Chemical Engineering) and **Prof. Mayuri Gandhi** (Centre for Research in Nanotechnology and Science).

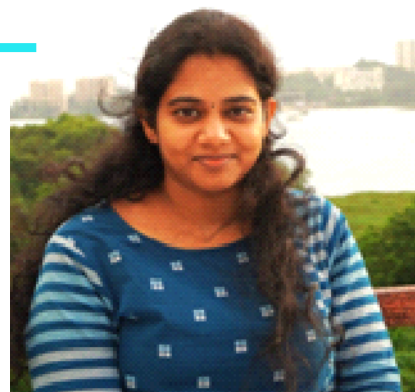
Dr. Pravin Varade, a Ph.D. student of **Prof. Ajit Kulkarni** and **Prof. N. Venkatramani** (Department of Metallurgical Engineering and Materials Science), has been selected for the **Best PhD Thesis Award** for his thesis, "*Investigation of Piezoelectric Behaviour of Multifunctional Alkali and Alkaline-earth Ceramics*" and **Best Oral Presentation Award** at the **International Conference on Advanced Functional Materials and Devices (AFMD-2024)**, at SRM University, Chennai in February 2024.



Ms. Sayoni Sarkar, a Ph.D. student of Center for Research in Nanotechnology and Science (CRNTS), IIT Bombay, has been awarded the **second prize** out of 600+ ideas in the flagship **New Generation Ideation Contest** for her work on "*Hollow 3D nanostructures of defect-rich ceria quantum dots synthesized via continuous flow route for solar-driven green H₂ production*". The Contest was organized by Hindustan Petroleum Corporation Limited on March 27, 2024, at HP Green R&D Centre, Bengaluru.

This is anticipated to contribute to the country's net-zero targets and aligns with HPCL's mission of maximizing green energy generation by 2030. Her supervisors are **Prof. Ajit Kulkarni** and **Prof. Rohit Srivastava**.

Ms. Athira KV, a Ph.D. student in the Department of Civil Engineering, has **won second prize** in the **student poster competition** for her presentation titled "*Evapotranspiration Estimation Using Multimodel Ensemble (abstract number: 435162)*" at the **2024 American Meteorological Society (AMS) Annual Meeting 38th Hydrology Conference**. She is the only Indian student and second Asian student to win in this competition in the last 10 years! **Prof. Eswar Rajasekaran** is her supervisor.



IIT Bombay Team Wins At 'US Solar Decathlon Design Challenge 2024'

Team SHUNYA (Sustainable Housing for an Urbanizing Nation by its Young Aspirants), a student-driven technical team at IIT Bombay, representing India, has secured **first place** in the Multifamily Housing Division at the **US Solar Decathlon Design Challenge 2024** for **Project Samsara**. IIT Bombay students **Mr. Ali Khan, Mr. Varun Padake, Ms. Simran Chaudhury, Ms. Zenab Kagzi and Mr. Prabhat Sharma**, along with **Prof. Gurubalan Annadurai**, represented the team in the competition during April 19-21, 2024 in NREL, Golden, Colorado, USA.



Project Samsara involved deep retrofitting of a slum rehabilitation housing (SRH) building near Century Mills, Mumbai, India. The goal of the retrofit is to enhance health and safety within SRH occupants through architectural and engineering interventions. The team adopted innovative void strategies (creating empty spaces) based on structural limitation, daylight autonomy, ventilation and energy performance to improve air circulation and create spaces for community engagement. Additionally, a membrane-based heat pump system for achieving thermal comfort and a smart demand management system for improved grid interaction were designed.

After implementing several such interventions, the retrofit proposal increased the habitable area by 60%, improved daylight autonomy by 35% and introduced two external fire staircases for safety. Also, the building became Net Positive Energy, IGBC Net Zero Water with Net Positive Carbon over the life span of the building. Most importantly, all these strategies were planned so that the building could be retrofitted without moving any tenant out of the building. Continuing the legacy, this is the third trophy won by the team in a row in the US Solar Decathlon competition.

Notification

Prof. Perumal Vedagiri, Department of Civil Engineering, has been appointed as **Dean (Infrastructure Planning and Support)** w.e.f. June 12, 2024

Prof. Venkata Santosh Kumar Delhi, Department of Civil Engineering, has been appointed as the **Associate Dean-I (Infrastructure Planning and Support)** w.e.f. June 12, 2024

Prof. Ruchi Anand, has been appointed as the **Head, Department of Chemistry** w.e.f. May 1, 2024

Prof. Sukumar Srikant, has been appointed as **Head, Systems and Control Engineering** w.e.f. June 5, 2024

Prof. Prasanna Gandhi, Department of Mechanical Engineering, has been appointed as the Professor Incharge of the **IITB-Monash Research Academy** w.e.f. May 31, 2024

Prof. Snehal S. Awate, Shailesh J. Mehta School of Management, has been appointed as the Professor Incharge of the **HDFC-Ergo IIT Bombay (HE-IITB) Innovation Lab** w.e.f. May 16, 2024.

Prof. Rakesh Mote, Department of Mechanical Engineering, has been appointed as **Warden, Hostel No.17** w.e.f. June 6, 2024

Prof. Rajbabu Velmurugan, Department of Electrical Engineering, has been appointed as **Chairperson of GATE-JAM 2025**.

Prof. Arpita Sinha, Systems and Control Engineering Group, has been appointed as **Vice Chairperson of GATE-JAM 2025**.

Prof. Pradeepkumar P. I., Department of Chemistry, has been appointed as **Vice Chairperson of GATE-JAM 2025**.

Dr. Nayan Dabholkar, Chief Hospitality Manager (Scale-C), Hospitality Section, has been designated as **Additional Registrar** w.e.f. June 4, 2024

Mr. Yogesh S. Patil, Deputy Registrar (Hostel Coordinating Unit), has been designated as the **Central Public Information Officer (CPIO) of IIT Bombay** w.e.f. June 6, 2024

IIT Bombay Hosts Annual CSR Conclave 2024

IIT Bombay concluded its much-anticipated **3rd Annual CSR Conclave** on June 14, 2024. The theme of this year's conclave, '*Unlocking CSR for Impactful Research*', brought together domain experts, industry heads and corporate leaders to explore the pivotal role of corporate social responsibility (CSR) in propelling research initiatives and technological advancements, that have the potential to empower both the society and the nation. Over 200 corporate delegates attended the event.

Reflecting IIT Bombay's legacy of innovation and excellence, the conclave underscored the Institute's leadership in societal advancement and nation-building. The Institute has employed a comprehensive three-pronged approach to drive impactful research and technological advancements. Consequently, IIT Bombay has invested in areas of strategic national importance such as defence, quantum technology, AI and cybersecurity. It continues to drive economic growth and societal progress in critical sectors like semiconductors, green energy and pharmaceuticals. Finally, innovations emerging from the Institute significantly impact key domains like healthcare, sanitation and education. All these research projects' outcomes align with the Sustainable Development Goals (SDGs).

The Conclave commenced with a warm welcome from **Prof. Shireesh B. Kedare**, Director of IIT Bombay, who set the tone for the day's discussions and activities. Prof. Kedare emphasized the Institute's commitment to innovation for societal impact and its role as a leader in driving research and technological advancements that address pressing societal challenges.



Distinguished Alumnus Mr. Adil Zainulbhai addressing the audience during Annual CSR Conclave 2024

Prof. Kedare expressed his optimism for the conclave stating, *"I encourage each of you to think about how you can contribute to or enhance these initiatives. The path to a sustainable and equitable future requires collective effort and shared wisdom. It is up to us, as leaders in our respective fields, to ensure that our actions today create a positive and sustained effect on the generations to come"*.

He also elaborated on the Institute's robust technological ecosystem, saying, *"At its heart are the Centres of Excellence and state-of-the-art labs that are pushing the boundaries of what is possible in science and technology. We look forward to further collaborations and breakthroughs that will shape the future of science and technology, both nationally and globally"*.



Panel discussion during Annual CSR Conclave 2024

The event witnessed the convergence of eminent personalities, including Distinguished Alumnus Mr. Adil Zainulbhai (B.Tech., Mechanical Engineering, 1977), Chairman of the Capacity Building Commission, Government of India, who presided as the Chief Guest. Mr. Zainulbhai, with his wealth of knowledge and experience from his tenure as the Chairman of McKinsey India and the Quality Council of India, enriched the event's discussions and inspired innovative approaches to CSR partnerships. Additionally, Distinguished Alumnus Dr. Ganesh Natarajan (PhD, School of Management, 2005), Executive Chairman and Founder of 5F World, engaged in an insightful Fireside Chat with Mr. Adil Zainulbhai. Their collective experience offered an in-depth understanding of the art of building corporate partnerships.

Mr. Zainulbhai reflected on the significance of CSR partnerships in his address stating, *"The theme 'Unlocking CSR for Impactful Research' serves as a clarion call for industry and academia to join forces and leverage corporate social responsibility (CSR) in propelling innovation and societal progress. As an alumnus of this esteemed Institute, it is my profound honour to witness the impactful legacy being forged by my alma mater through endeavours such as this Conclave. By strategically investing CSR resources into innovative research, we can drive technological advancements that not only address societal needs but also catalyse sustainable development"*.

Mr. Zainulbhai's thought-provoking address was followed by **Mr. Ravi Gedela**, CEO of the IIT Bombay Development Relations Foundation, who highlighted the Institute's commitment to fostering impactful collaborations and leveraging CSR initiatives for societal progress. The conclave also featured a fireside chat featuring Mr. Zainulbhai and moderated by **Mr. Ganesh Natarajan**, another esteemed IIT BOMBAY alumnus, who provided further insights into the significance of CSR partnerships and collaborative efforts in driving societal impact.

The conclave featured two impactful panel discussions. The first panel titled **'Impact of**

Corporate Partnerships through CSR to Advance Research in Areas of Technology' highlighted the need to foster a collaborative environment, where new ideas and strategies can emerge to fuel technological innovations for the progress of society and the nation. In the second panel titled **'Simplifying Decisions on CSR Partnerships with Academia'**, panelists explored the transformation of Corporate Social Responsibility (CSR) from a peripheral activity to a core strategic function. Additionally, the panelists delved into how leveraging partnerships with academic institutions can yield valuable research and innovative solutions, ultimately leading to impactful CSR outcomes.

Other highlights of the conclave included the **'Tech Showcase'** where faculty members from IIT Bombay showcased cutting-edge innovations and research initiatives through a diverse array of presentations. These provided valuable insights into addressing critical societal issues, demonstrating the Institute's dedication to translating research into tangible and meaningful results. The Tech Exhibition stalls highlighted technologies developed by various centres, including the Koita Centre for Digital Health (KCDH), the Wadhwani Research Centre for Bioengineering (WRCB), the Biomedical Engineering and Technology Innovation Centre (BETIC), the Trust Lab, the EV Lab and more.

The event also marked the launch of the **'Annual CSR Catalogue, 2024,'** which highlighted several research projects at the Institute across sectors such as education, healthcare, nutrition, rural development, entrepreneurship and women empowerment. The catalogue provided detailed information on ongoing projects and opportunities for partnerships, fostering collaboration and transparency and enhancing the impact of contributions.

The day culminated with the Strategic Partnership Awards ceremony that recognised and honoured IIT Bombay's leading partner organisations for their outstanding contributions to driving positive change and societal impact. These ranged from setting up centres of excellence, establishing hubs and labs, providing chair professorships to faculty members and supporting various initiatives.

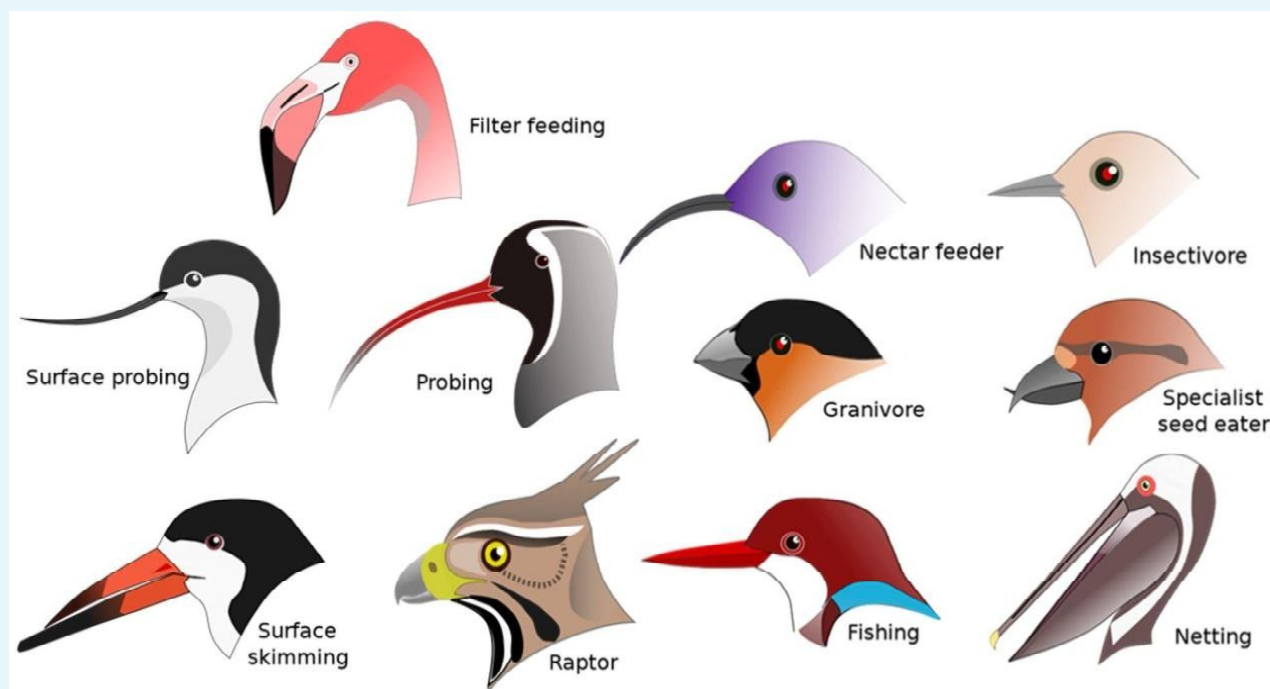
As the Annual CSR Conclave at IIT Bombay drew to a close, it underscored the critical role of CSR partnerships in fostering innovation, advancing research and addressing pressing societal challenges, toward a future defined by progress, inclusivity and resilience.



From (L-R) Mr. Ravishankar Gedela - CEO, Development and Relations Foundation, IIT Bombay, Prof. Ravindra Gudi, IIT Bombay Dean (Alumni and Corporate Relations), Distinguished Alumnus Dr. Ganesh Natarajan and Mr. Adil Zainulbhai during the launch of the Annual CSR Catalogue 2024

Research in focus

Study Reveals How New Species Evolve Without Geographic Barriers



Not to scale

L. Shyamal, CC-by-SA-2.5

Bird beaks have evolved differently based on what they feed. Credit: L. Shyamal

Researchers at IIT Bombay discover the role of environmental resources, genes and mating in species in the development of new species in the same area, challenging the traditional view that new species can develop only in distinct geographies.

The evolution of life on Earth from around 3.5 billion years ago to today has shaped the planet's biodiversity. This has included the transition from organic molecules to single-cell organisms, to multicellular organisms, and finally, complex life forms (like mammals and birds). Yet, how new species come into being remains a mystery!

A new study conducted by scientists from the Indian Institute of Technology Bombay (IIT Bombay), Mumbai published in NPJ Systems Biology and Applications, has shed light on the process of speciation, meaning the formation of new species, in the absence of

geographic barriers. Traditionally, it is believed that speciation largely occurs when populations of a species are isolated from each other by geographical barriers such as mountains or bodies of water. This is called allopatric speciation. However, the new IIT Bombay research suggests that speciation can happen even when populations live in the same area without geographical barriers. This mode of speciation is called sympatric speciation. *"While there is ecological evidence in favour of this (sympatric) hypothesis, there is no experimental evidence. And in the absence of a laboratory model in which to study sympatric speciation, it is difficult to understand it as a process. The motivation of our work is to understand how the environment and the underlying genetics can lead to sympatric speciation and design biologically insightful experiments,"* remarks **Prof. Supreet Saini**, Professor at the Department of Chemical Engineering and DBT/ Wellcome Trust (India Alliance) Fellow at IIT

Bombay and the lead researcher of this study, as the motivation behind this study.

The researchers used a genetic-based model to investigate the factors that contribute to speciation when populations live in the same geographic area. This theoretical study focused on a population of birds using simulated data and specifically looked at how three aspects that encourage speciation, namely, disruptive selection, sexual selection, and genetic architecture play a role in driving and maintaining sympatric speciation.

Disruptive speciation

"In sympatric speciation, the "divide" in the population can be created due to non-uniform resources present in the environment, and geography has no role to play here. This is called ecological disruptive selection," explains co-author **Pavithra Venkataraman**, PhD student & a Prime Minister's Research

Fellow at IIT Bombay. In other words, disruptive selection is a process by which individuals with extreme traits have a higher fitness than those with intermediate traits. Pavithra adds, "Disruptive selection is necessary for speciation to occur in sympatry because it (a) favours heritable differences in the population, and (b) ensures that the offsprings produced by the mating of individuals belonging to two different groups do not survive. These two factors are extremely important for maintaining biodiversity in sympatry."

In this study, the researchers focused on a physical trait of the birds - the beak size. The birds in the population had to adapt their beak size to best utilise two types of food resources, A (say, nuts) and B (flower nectar). Birds with small beaks will be better at utilising resource A, while those with longer beaks will be more efficient at utilising resource B.

Role of sexual selection

Sexual selection, on the other hand, is a type of natural selection driven by competition for mates. It can lead to the evolution of elaborate traits that are attractive to potential mates. In this study, the researchers looked at how female mating preference, based on a male's intensity of the trait (unique character), could play a role in speciation.

"Sexual selection has been thought to be one of the main, or often, the sole driver of sympatric speciation. Essentially, it was thought that some members of the populations could evolve a 'bias' towards a trait like feather colour, and a difference in this bias could lead to sympatric speciation. For example, consider a bird population where there are

two types of feathers - blue and red. If a bias evolves among the blue birds to only mate with their kind, sympatric speciation would occur because the red birds don't mix their genes with the blue ones," explains Pavithra. In other words, this could lead to populations with distinct blue and red traits.

"The drawback of this hypothesis is that there is no basis for such a bias to evolve unless there is a fitness benefit. In other words, why does a blue bird mate only with a blue one, reducing its mate pool is not clear," questions Pavithra.

The researchers then also incorporated the ability of the bird to utilise resources in the environment into their model. Surprisingly, the researchers found that sexual selection based on special traits did not contribute to speciation in sympatry. Instead, they found that the preference for mates based on a relevant trait that helps in utilising the environmental resources better (in this case, beak size), was the driving force behind speciation. The study also acknowledges the possibility of lower fitness of the offsprings due to sexual selection.

Genetic architecture has a key role

Furthermore, the researchers discovered that genetic architecture, or how genes control the trait under selection, was a crucial factor in determining the likelihood of sympatric speciation. If the genetic architecture allowed changes in beak size, then a new species could develop even with a weak role of disruptive selection.

On the limitations of the study, Prof. Saini mentioned, *"In our model, we assume that birds from the two groups mate without any bias and that this bias does not change with time. This may not be true in natural*

populations, where a bias based on the beak size is expected to evolve. It is also possible for the birds of the two groups to evolve with distinct markers that help them distinguish their "kind" from the other."

Nevertheless, this study provides valuable insights into the conditions and mechanisms that can lead to sympatric speciation. It challenges the traditional view that speciation can only occur in geographical isolation and highlights the importance of genetic architecture and ecological selection in driving the formation of new species.

"A large part of our research effort is to take lessons from theory and to design experiments for understanding how reproductive barriers evolve between members of the population in sympatry. Towards this, we work with yeast to demonstrate & establish a laboratory model to study speciation in sympatry," adds Prof. Saini while indicating the path ahead.

By unravelling the mysteries of speciation, scientists are gaining a deeper understanding of the incredible diversity of life on our planet and the processes that generate it. By demonstrating how sympatric speciation can occur, even with relatively low levels of disruptive selection, the researchers have provided a framework for future experimental studies on biodiversity. This knowledge could open up new avenues for research and help scientists better understand the mechanisms behind the biodiversity on Earth. With the imminent threat of climate change, perhaps this can also shed light on the impacts of climate change on biodiversity at large.

Article written by: Sudhira H.S.

Link to published work: <https://www.nature.com/articles/s41540-024-00332-w>

Institute Colloquium / Lectures



Prof. Michael L. Klein, Laura H. Carnell Professor of Science and Director of the Institute for Computational Molecular Science, College of Science and Technology at Temple University in Philadelphia, US, delivered Prof. N. R. Kamath Distinguished Institute Lecture titled “*Knots in Polymers*” on April 16, 2024



Adv. Niranjan Mundargi, Criminal Counsel, Bombay High Court, other Special Criminal Courts, delivered an Institute talk titled ‘*Three new Criminal Laws (Bharatiya Nyaya Sanhita, 2023, Bharatiya Nagarik Suraksha Sanhita, 2023 and Bharatiya Sakshya Adhiniyam, 2023)*’ on April 30, 2024



In the
Wilderness



Photo Credit :

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@pranadhprabhakar

Awards and Distinctions

Prof. Debabrata Maiti, Department of Chemistry, has joined as the Editor-in-Chief for Thieme Chemistry journal *SYNLETT*, starting January 2024. Prof. Maiti is the first Editor-in-Chief from India in the history of Thieme Chemistry journals.
<https://www.wrcb.in/news/prof-debabrata-maiti-is-synlett-new-editor-in-chief/>

Prof. Rohit Srivastava, Department of Biosciences and Bioengineering, has been awarded the highly esteemed **Shri Om Prakash Bhasin Award** under the Health and Medical Sciences category for the year 2018 in New Delhi. The award carries a prize of one lakh Indian rupee, a plaque and a citation.

<https://www.wrcb.in/news/prof-rohit-srivastava-receives-the-prestigious-shri-om-prakash-bhasin-award/>

Prof. Santanu Banerjee, Department of Earth Sciences, has joined as a Member of the Editorial Review Board of the Journal *Sedimentary Geology-Elsevier*

Prof. Juzer Vasi, Department of Electrical Engineering, has been honoured with the **Lifetime Achievement Award** for his pioneering contributions to India's micro/nanoelectronics, photovoltaics and electron Devices Society ecosystem by IEEE Electron Devices Society at the **8th IEEE EDTM Conference** held at Bangalore during March 3-6, 2024.

https://www.linkedin.com/posts/udayan-ganguly-b851ab6_professor-juzer-vasi-was-honored-by-ieee-activity-7172766805009154048-Z7Ma?utm_source=share&utm_medium=member_desktop

Prof. Rahul Sapkal, Ashank Desai Centre for Policy Studies, has been awarded the **Best Paper and Rudra Dutta Young Labour**

Economist Award at the 64th Indian Society of Labour Economist Annual Conference held at Central University of Hyderabad during March 29-31, 2024. This is a prestigious award conferred for conducting innovative studies in the areas of labour economics/ studies.

The research paper titled "**Power efficient Analog Assisted Digital Voltage Regulator for implantable medical devices**" by **Prof. Rajesh Zele**, Department of Electrical Engineering, co-authored with his PhD students **Mr. Shubham Jain** and **Mr. Sumit Khalapure**, won the **Best Paper award at IEEE conference 'Latin American Symposium on Circuits and Systems (LASCAS) 2024'** held in Uruguay.

Prof. Souvik Mahapatra, Department of Electrical Engineering, has developed a "**Mahapatra Model**" in collaboration with the R&D team of Synopsis, a leading Electronic Design Automation (EDA) company, that will be using the name in their S-Device User Guide and other official Synopsys materials to refer to the IIT-Bombay reliability model. This work would enable co-optimisation of Power Performance Area and Reliability (PPAR) in Design Technology Co-Optimisation (DTCO) efforts.

Prof. Subimal Ghosh, Department of Civil Engineering, has been awarded the prestigious **Alexander von Humboldt Medal** by the *European Geosciences Union* for his significant contributions in hydrometeorology, climate services, climate education and societal impacts related to the complex South Asian Summer Monsoon System. He is the second Indian to receive this Medal.

Prof. Kasturi Saha, Department of Electrical Engineering, has been awarded the **APL-sponsored Young Applied Physicist Award** at the National Physicists' Conclave 2024.

Prof. Amartya Mukhopadhyay, Department of Metallurgical Engineering and Materials Science, along with former PhD students **Bachu Sravan Kumar** and **Anagha Pradeep**, received the **Bharat Petroleum Corporation Ltd. (BPCL) Innovation Award** for the '**Development of High Sodium containing high performance P2-structured 'Layered' Sodium Transition Metal Oxide-based Cathode for Na-ion Batteries**'.

Prof. Rajiv O. Dusane and **Prof. Amartya Mukhopadhyay**, Department of Metallurgical Engineering and Materials Science, along with **Rashmi Tripathi** (former PhD student) and **Vaishali Chauhan** (PhD student), received the **Bharat Petroleum Corporation Ltd. (BPCL) Innovation Award** for the '**Development of Silicon nanostructures on Copper for application as anode in Li-ion battery**'.

Prof. Vikram Vishal, Department of Earth Sciences, has been awarded as the **INSA Distinguished Lecture Fellowship 2024** award.

Prof. Swatantra Pratap Singh, Environmental Science and Engineering Department, has been elected as **INSA Young Associate 2024**.

Prof. Subrato Banerjee, Department of Economics, has joined as the Editorial board member of "*Nature - Humanities & Social Sciences Communications*".

Prof. Pushpak Bhattacharyya, Department of Computer Science and Engineering, has been appointed as the **Chairman of the National Committee on "Indian Language Standards"** by the Ministry of Electronics and Information Technology to examine the encoding, font, search performance and language technology applications for all 23 official languages of the country.

Prof. Rajesh Zele, Department of Electrical Engineering, along with his Ph.D. students **Shubham Jain** and **Sumit Khalapure**, has been awarded the '**Best Paper Award**' at *IEEE conference LASCAS 2024*.

Prof. S. Shankaranarayanan, Department of Physics, along with his Ph.D. student **Mahesh Chandran** has received the **honorable mention** for their essay in the *Gravity Research Foundation essay competition (75th edition)*.

Prof. Milind Atrey, INOX Chair Professor of Cryogenics, Department of Mechanical Engineering, has been elected as the Member of the *International Academy of Refrigeration (IAR)*. Prof. Atrey is the first member from India of this Academy.

Conferences

The **BiOME Lab** at the **Department of Mechanical Engineering**, organised **BiOMEx '24**, a two-day international symposium on Musculoskeletal Biomechanics in Engineering and Medicine during May 3-4, 2024. The symposium was in collaboration with the Biomedical Engineering and Technology Innovation Centre (BETIC) and the Wadhwani Research Centre for Bioengineering (WRCB). **Prof. Darshan S. Shah** was the convener for this symposium.

The **Department of Humanities and Social Sciences, IIT Bombay**, organised a **National Conference on Agency and Value** during June 3-4, 2024. The event was in collaboration with Institute of Eminence, IIT Bombay, Tattvanveshi Philosophical Society: Forum for Philosophy and Professor Geeta Ramana's Memorial Research Scholar Forum, Department of Philosophy, University of Mumbai. **Prof. Ranjan Panda** was the convener.

Workshops

The **Behavioural Lab** at **Shailesh J. Mehta School of Management (SJMSOM), IIT Bombay** organised a one-day workshop on **Consumer Neuroscience** on May 2, 2024. The speakers were marketing stalwarts **Prof. Arvind Sahay**, MDI Gurgaon and **Ms. Sunila G. Benjamin**, Director, Neuro and Design, APMEA, NIQ BASES.

A hands-on training with eye-tracking methodology led by **Prof. Arti D. Kalro**, **Prof. Dinesh Sharma**, **Prof. Mayank Pareek** and **Ms. Shruti Trehan** was also conducted following the workshop. This workshop was supported by the *Institute of Eminence funding, Sanki Machine Tools Pvt. Ltd., and Tiden Technologies*.

The **Department of Humanities and Social Sciences, IIT Bombay**, organised a two-day workshop on *Pali Buddhist Literature: An Overview* on May 3, 2024. **Mr. Wimal Hewamanage**, Professor in Pali and Buddhist Studies, Department of Buddhist Studies, University of Colombo, Sri Lanka was the speaker. **Prof. C.D. Sebastian** was the convener.

The **Department of Humanities and Social Sciences, IIT Bombay**, organised a two-day workshop on **Self and Society** during June 1-2, 2024. The event was in collaboration with Institute of Eminence, IIT Bombay. **Prof. Ranjan Panda** was the convener.

The **Department of Energy Science and Engineering, IIT Bombay** in association with **University of Groningen** organised a two-day joint workshop on **Biohydrogen and Fuel Cell systems** during June 3-4, 2024.

Appointments



Dr. Saket Kumar Choudhary, has been appointed as Assistant Professor Grade I in the Koita Centre for Digital Health w.e.f. March 28, 2024



Prof. Mahendra Shahare, has been appointed as Assistant Professor Grade I in the Department of Humanities and Social Sciences w.e.f. April 16, 2024



Dr. Neha Chatterji, has been appointed as Assistant Professor Grade I in the Department of Humanities and Social Sciences w.e.f. May 13, 2024



Dr. Vivek Kumar, has been appointed as Assistant Professor Grade II in the Department of Earth Sciences w.e.f. May 13, 2024



Prof. Uditendu Mukhopadhyay, has been appointed as Assistant Professor Grade I in the Department of Physics w.e.f. June 18, 2024

Retirements on April 30, 2024

Prof. P. Vellaisamy, Department of Mathematics, retired after 33 years of service



Prof. Shyam R. Asolekar, Environmental Science and Engineering Department, retired after 31 years of service



Prof. Devang V. Khakhar, Department of Chemical Engineering, retired after 37 years of service



Mr. Sunil L. Dhiwar, Sr. Assistant Registrar, Legal and Right to Information Unit, retired after 33 years of service



Mr. Mohan M. Waidande, Sr. Lab Assistant, IIT Bombay Campus School and Junior College, retired after 36 years of service



Mr. Mangesh V. Khale, Sr. Mechanic, Electrical Maintenance Division, retired after 37 years of service



Ms. Anita B. Hiregange, Sr. Primary Teacher, IIT Bombay Campus School and Junior College, retired after 34 years of service



Mr. Vivek G. Bhadange, Sr. Administrative Superintendent (P), Materials Management Division, retired after 33 years of service



Retirements on May 31, 2024

Mr. Vasant J. Vandurkar, Technical Officer (Scale-II)-A(P), Department of Mechanical Engineering, retired after 34 years of service



Mr. Vilas B. Ghanekar, Sr. Multiskilled Assistant, Department of Mechanical Engineering, retired after 37 years of service



Mr. Raghunath D. Adhav, Sr. Security Guard, Security Section, retired after 32 years of service



Mr. Manohar M. Mane, Sr. Security Guard, Security Section, retired after 32 years of service



Mr. Ramesh H. Boke, Sr. Security Guard, Security Section, retired after 31 years of service



Mr. Vijay N. Gawade, Administrative Assistant (P), Central Library, retired after 32 years of service



Mr. Shantilal M. Solanki, Multiskilled Assistant C, IIT Hospital, retired after 22 years of service



Ms. Shirley Stanley, Multiskilled Assistant B, Hostel No-11, retired after 32 years of service



Retirements on June 30, 2024

Dr. Nayan S. Dabholkar, Additional Registrar, Guest House, retired after 29 years of service



Dr. Vinodkumar R. Prasad, Sr. Assistant Registrar, Industrial Research and Consultancy Centre, retired after 38 years of service



Ms. Nafisa G. Kazi, Administrative Superintendent (P), IIT Hospital, retired after 36 years of service



Mr. Vasant K Birare, Multiskilled Assistant C, National Cadet Corps, retired after 33 years of service



CEP courses scheduled during July, August, September 2024			
No	Course Title	Course Coordinator/ Department	Duration
Open Programmes : (July 2024)			
1	Design, Construction And Recent Developments On Concrete Pavements	Prof. Dharamveer Singh, Department of Civil Engineering	July 3, 2024 (3 days)
2	Financial Analytics (For IIT Bombay Alumni only)	Prof. Piyush Pandey Shailesh J. Mehta School of Management	July 8, 2024 (2 days)
3	Next-Gen Innovation: AI And Design Thinking	Prof. Sandesh Ramu, IDC School of Design	July 15, 2024 (20 days)
4	Electric Mobility	Prof. Prashant Date, Department of Mechanical Engineering	July 17, 2024 (4 days)
5	Lean and Six-Sigma Techniques For Process Improvement In Industries	Prof. Manoranjan Sahu, Environmental Science and Engineering Department	July 26, 2024 (3 days)
In-House Programmes:			
6	TechTrends	Prof. Siddhartha Ghosh, Department of Civil Engineering	July 1, 2024 (6 days)
7	Interaction Design Driven Innovations	Prof. Anirudha Joshi, IDC School of Design	July 11, 2024 (2 days)
8	Bituminous And Concrete Pavements For Runway	Prof. Dharamveer Singh, Department of Civil Engineering	July 19, 2024 (2 days)
In-House Programmes: (August 2024)			
9	Service Design Driven Innovations	Prof. Anirudha Joshi, IDC School of Design	August 22, 2024 (2 days)
Open Programmes: (September 2024)			
10	Prompt Design In Chatgpt, Dall-E and Midjourney For Entrepreneurs	Prof. Sandesh Ramu, IDC School of Design	September 1, 2024 (2 days)
11	Machinery Vibration And Noise	Prof. Dhanesh Manik, Department of Mechanical Engineering	September 25, 2024 (3 days)
In-House Programmes:			
12	Product Design Driven Innovations	Prof. Anirudha Joshi, IDC School of Design	September 19, 2024 (2 days)

