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# ASPIRE
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## VOLUME IV

# THE INNOVERSE GRID

APRIL 2026

# LEADERS AT THE HELM: DRIVING RESEARCH, ENABLING IMPACT

## Featuring voices across academia and industry advancing innovation from lab to real-world application.

The April 2026 edition of The Innoverse Grid brings into focus leadership at the intersection of research, industry, and real-world application. As the innovation landscape becomes increasingly outcome-driven, the emphasis is steadily shifting from isolated research efforts to collaborative, translational ecosystems that enable scale and impact.

This edition highlights leaders across IIT Bombay and its extended network who are actively shaping this shift — through industry engagement, applied research, and cross-sector collaboration. Spanning domains such as clean energy, intelligent systems, advanced materials, and environmental technologies, these voices reflect a growing alignment between scientific inquiry and practical deployment.

At ASPIRE IIT Bombay Research Park Foundation, this intersection remains central to our mandate. By enabling structured industry–academia engagement, we aim to support pathways where research can move beyond the laboratory into partnerships, pilots, and scalable solutions.

Through this edition, we bring together a set of perspectives and experiences that underscore what it means to lead in a translational ecosystem — where ideas are not only developed, but actively driven toward impact.

Dear Readers,

Greetings from ASPIRE IIT Bombay Research Park Foundation!

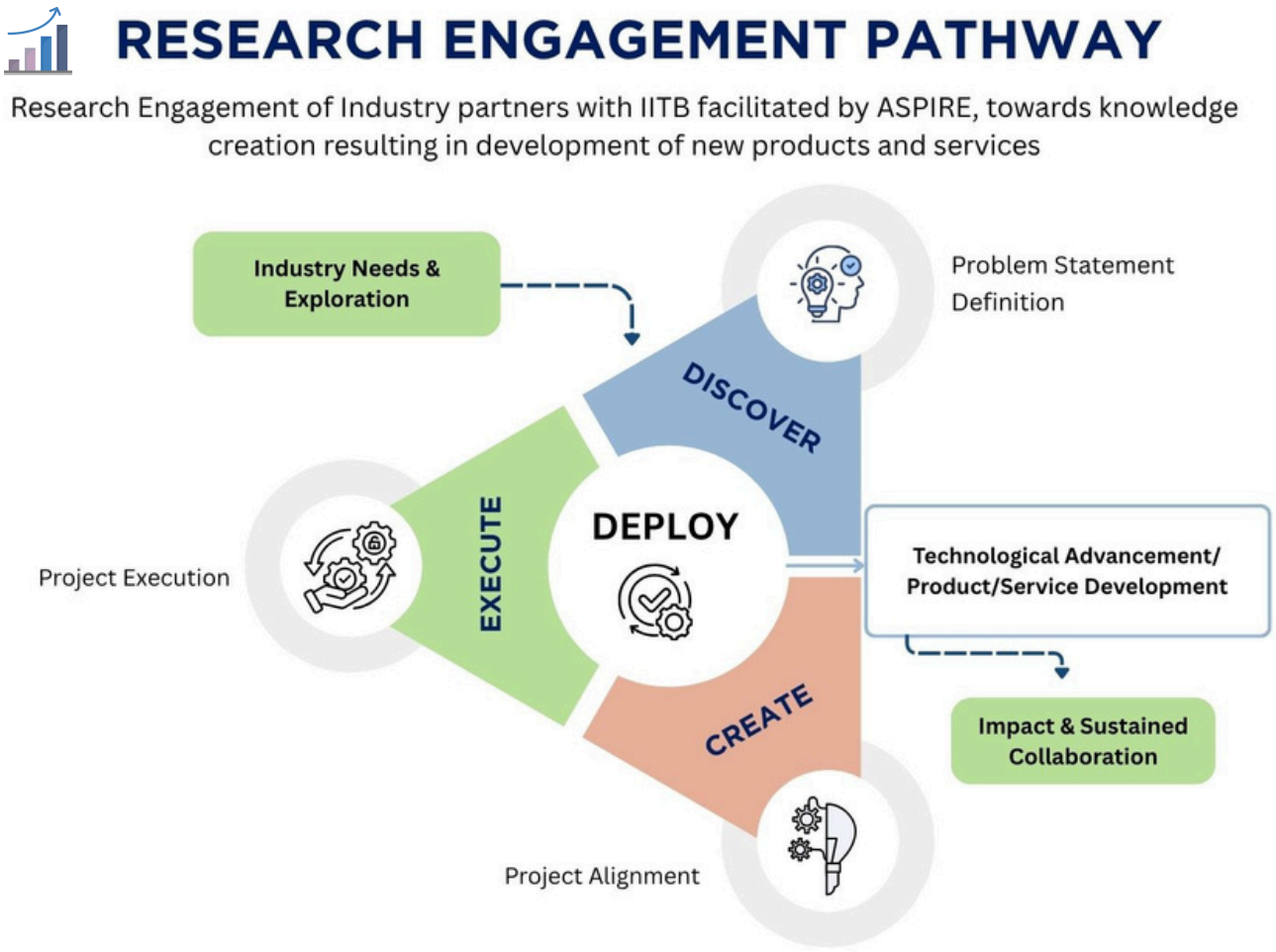
As we begin our 10th year of incorporation and 2nd full year of collocation at the new building of ASPIRE IIT Bombay Research Park, we look forward to the next decade of growth!

ASPIRE's vision is to build a thriving research ecosystem at IIT Bombay, through meaningful partnerships between academia, industry and government entities. We aim to drive research engagement of hundreds of industry partners, leveraging the incredibly deep and broad knowledge ecosystem of IIT Bombay.

**Dr. Rajappa Tadepalli**

**CEO, ASPIRE**
**IIT Bombay Research Park Foundation**

Research/Innovation processes are inherently non-linear. Our research engagement model provides structure to improve time to market and increase stakeholder satisfaction. We are piloting a three-bucket process as outlined.




We drive curated research engagements through problem statement definition and alignment (Discover), clear project structuring (Create), and guidance on project execution meeting stakeholder expectations (Execute). We are seeing early results of this model with our member companies in the areas of FinTech, AI-enabled products and services, Robotics, Core materials/chemistry research, among others.

We welcome more industry partners on board – we are here to facilitate acceleration of your Innovation journey.

# From Waste to Wealth: Recycling of Critical Metals for Clean Energy Sectors

India's ambitious decarbonization roadmap includes strategies such as the adoption of electric vehicles, the expansion of solar/wind power infrastructure, and the replacement of fossil-fuel-based metal production processes with green hydrogen.

**– PROF JAYASREE BISWAS**

This demands a steady supply of raw materials, which is at risk due to the current geopolitical scenario. The government of India has identified a few metals as critical, due to their strategic importance and supply vulnerability, and is emphasising the recycling and recovery of these critical metals from urban ores as a potential alternate pathway.

Prof. Jayasree Biswas has been a researcher in process metallurgy and process modelling, with an interest in metal extraction and refining across the ferrous and nonferrous sectors.

Her research group is currently working on the recycling of spent Li-ion batteries to recover battery-grade materials, recycling of spent NdFeB magnets for REE extraction, through a combination of pre-treatment followed by pyro/hyro-metallurgical processes. Her group has established a partnership with recycling industries – Lohum, Attero and Evergreen Recycle Karo through the Centre of Excellence in Critical Minerals, Metals and Materials, IIT Bombay.

Her research group is also working on the challenges of the green transition in the steel sector, and on the recycling and reuse of slag wastes from the steel industry, collaborating with Tata Steel and Jamipol Industries.

# Where is Control, and Where is Learning?

This question sits at the heart of modern robotics, yet it is often blurred by trends that swing too quickly from one paradigm to another. As a researcher in embedded control and mobile robotics at IIT Bombay, my work has consistently tried to bridge this divide—not by choosing one over the other, but by asking how the two can coexist meaningfully.

Control offers guarantees. It gives us stability, safety, and predictability—properties that are non-negotiable when robots operate in real-world environments, whether underwater, on roads, or alongside humans. Learning, on the other hand, offers adaptability. It allows systems to function in uncertainty, to improve with experience, and to make decisions where explicit models fall short.

The challenge is not merely integrating learning into control pipelines, but doing so without sacrificing the rigor that control theory demands. In my research, this translates into developing frameworks where learning augments decision-making—guiding long-term planning or adapting to unknown conditions—while control ensures that every action remains within provable safety bounds.

This balance becomes particularly critical in applications such as autonomous underwater vehicles or multi-agent robotic systems, where uncertainty is inherent and failures are costly. Here, neither pure control nor pure learning is sufficient.

The future of robotics lies not in replacing one with the other, but in understanding their boundaries—and designing systems that respect both.

**– PROF. LEENA VACHHANI**

Translational mobility research succeeds when policy, infrastructure, and AI systems are co-designed with real Indian roads in mind.

**– PROF. ARCHAK MITTAL**

# Building India's Autonomous Mobility Testbed from Campus to Real Roads

At IIT Bombay, we are building an integrated autonomous mobility ecosystem that moves decisively from lab-scale prototypes to real-world deployment.

A full-scale autonomous e-buggy platform, inaugurated at Techfest IIT Bombay 2025 by Hon'ble Shri Nitin Gadkari, Union Minister of Road Transport and Highways, and the Chief Defence Secretary, demonstrates our capability to operate safely in outdoor, unstructured environments using multi-LiDAR sensing, drive-by-wire, and onboard AI.

Complementing this, we hosted the Roboracer F1TENTH Autonomous Grand Prix, where our team secured 3rd place among national and international participants, showcasing strength in high-speed motion planning and control.

These efforts are reinforced through MoUs with KPIT, ITS India, NATRAX, Gahan AI, and DELBY Technologies, positioning IIT Bombay as a hub where academia, industry, and government co-create next-generation mobility solutions tailored to Indian roads and conditions.

# Bharat Innovates 2026 Pre-Summit at ASPIRE Sets Stage for India's Deep-Tech Leap



**MARCH 21–22, 2026**

The Bharat Innovates 2026 Pre-Summit, hosted at ASPIRE IIT Bombay Research Park Foundation, marked a significant milestone in India's deep-tech innovation journey.

The two-day national showcase brought together the country's most promising startups, policymakers, and industry leaders, creating a dynamic platform where research met real-world application.

Inaugurated by Prof. Ajay Kumar Sood, the summit featured an esteemed gathering including Dr. Vineet Joshi, Prof. Abhay Karandikar, Dr. Radhakrishnan Koppillil, and Director of IIT Bombay, Prof. Shireesh Kedare.

Out of over 3,000 applications, 137 startups were selected to present cutting-edge innovations across sectors such as semiconductors, space, climate, and MedTech - reflecting the scale and depth of India's emerging deep-tech ecosystem.

The defining moment of the summit, however, came with the visit of Dharmendra Pradhan, Hon'ble Minister of Education, whose interaction with ASPIRE leadership set the tone for the larger narrative of the event.



Engaging with Prof. Vikram Vishal and Dr. Rajappa Tadepalli, the Minister emphasised that India's innovation strength must now move beyond research and into execution. He highlighted that the true impact of innovation lies in its ability to translate into scalable, industry-ready solutions that benefit society at large.

This conversation underscored the critical role of ecosystems like ASPIRE in enabling this transition, bringing together academia, startups, industry, and government to accelerate the journey from lab to market. The Minister's walkthrough of startup exhibits, including interactions with ventures like UrjanovaC Pvt Ltd, further reflected growing national interest in deep-tech solutions addressing global challenges.

As the Pre-Summit concluded, it set the stage for the next chapter of Bharat Innovates 2026, where selected startups will represent India on a global platform in Nice, France, this June. More than a showcase, the event at ASPIRE stood as a powerful reminder that India's innovation ecosystem is not only growing but steadily transforming ideas into impact at scale.

# WOMEN AT THE HELM – WOMEN'S DAY LEADERSHIP DIALOGUE

**MARCH 2026**

On the occasion of Women's Day, ASPIRE – IIT Bombay Research Park Foundation hosted a leadership dialogue titled "Women at the Helm – Leadership in Action: Women Shaping Research, Industry & Institutional Strategy."

The session brought together leaders from academia, venture capital, industry, and institutional governance to reflect on leadership within complex research and innovation ecosystems.

Moderated by **Dr. Aishwarya Ramachandran**, a researcher working at the intersection of technology, policy, and innovation ecosystems, the dialogue featured:

- **Prof. Leena Vachhani** – Associate Dean (R&D), IIT Bombay
- **Ms. Vandana Rajadhyaksha** – Co-founder, Colossa Ventures LLP
- **Ms. Poyni Bhatt** – Chairperson, SEDEMAC | Former CEO, SINE – IIT Bombay
- **Ms. Juili Limaye** – Fragrance Innovation Lead, Unilever South Asia
- **Ms. Priyanka Jain Atal** – Chief Legal Officer, IIT Bombay

The discussion explored the realities of decision-making within multi-stakeholder institutional environments, where leaders must balance research priorities, industry engagement, governance frameworks, and long-term organisational strategy.

## Key Highlights:

- **Leadership in complex institutional systems**

Speakers reflected on how leadership in research-intensive organisations often requires navigating diverse stakeholder expectations while grounding decisions in structured analysis and long-term institutional thinking.

- **Institution-building and research translation**

Panellists emphasised the importance of institutional processes, documentation, and collaborative frameworks that enable research to translate into deployable technologies and industry partnerships.

- **Evolving professional environments**

The dialogue also touched on the changing nature of professional ecosystems, including the growing influence of digitalisation, sustainability priorities, and evolving organisational cultures.

# QCODE AT ASPIRE IIT BOMBAY RESEARCH PARK FOUNDATION: POSITIONING QUANTUM FOR ENTERPRISE-READY IMPACT

**APRIL 2026**


The inauguration of Deloitte India's Quantum Centre of Disruption for Enterprises (QCoDE) at ASPIRE signals a more defined shift in India's quantum journey - from exploratory research to enterprise-aligned application. Embedded within IIT Bombay's research environment, the centre brings together Deloitte's global quantum capabilities with academic expertise and an evolving industry–innovation interface.

As articulated by Mr. Romal Shetty, CEO, Deloitte South Asia, the initiative reflects an ambition to position India not just as a participant, but as a global hub for quantum innovation — driven by early capability-building, enterprise use-cases, and ecosystem collaboration.

Complementing this perspective, Dr. Renata Jovanovic, Partner and Chief Scientific Officer at Deloitte South Asia, emphasised the importance of translating quantum from theoretical promise into solutions for complex industrial challenges, particularly across domains such as materials science, logistics optimisation, and cybersecurity.
With Deloitte India establishing a presence within ASPIRE, the focus moves toward building structured pathways for engagement - where emerging technologies like quantum can be examined not just for their potential, but for their applicability across industry contexts.

At a broader ecosystem level, Dr. Rajappa Tadepalli, CEO, ASPIRE, emphasised the need to connect research efforts with innovation pathways that enable adoption. The ability to bring together researchers, enterprises, and emerging ventures within a single framework is central to translating technological progress into measurable outcomes.

These perspectives were further explored through a panel discussion featuring Prof. Siddhartha Santra, Prof. Himadri Shekhar Dhar, Prof. Sai Vinjanampathy, and Prof. Rahul Maitra. Drawing from their respective domains, the discussion brought out a layered view of India's quantum landscape.

Prof. Santra highlighted where India demonstrates credible research depth today, while also pointing to the need for sustained investment in foundational capabilities. Prof. Dhar emphasised that "readiness" must move beyond awareness towards building engineering capacity and hands-on experimentation. Prof. Vinjanampathy reflected on the importance of institution-led ecosystems such as QUICST in connecting research, infrastructure, and talent at scale. Prof. Maitra, in turn, underscored the need to evolve interdisciplinary approaches to both research and curriculum, ensuring that the next generation is equipped not just as specialists but as contributors to a broader quantum ecosystem.

As quantum technologies continue to evolve, initiatives such as QCoDE indicate a more deliberate approach — one that brings together research, industry, and innovation ecosystems to shape how and where quantum can deliver tangible value.

# INFOSPOT LAUNCH: ENABLING INDUSTRY ACCESS TO IIT BOMBAY TALENT

**APRIL 2026**

ASPIRE IIT Bombay Research Park Foundation recently hosted the inaugural session of Infospot, a new initiative designed to foster meaningful dialogue between the IIT Bombay ecosystem and its industry partners.

The first session, conducted in collaboration with the IIT Bombay Placement Cell, brought together member companies for a focused and insightful engagement on navigating the institute's structured placement ecosystem.

The session provided a comprehensive overview of the placement and internship process, including key timelines, procedures, and participation pathways for organizations. It also offered clarity on how companies can effectively engage with IIT Bombay to access its highly skilled talent pool.

More than an introductory interaction, the session served as a strategic deep dive into enabling companies to move beyond transactional hiring toward structured, long-term talent engagement.

The strong participation from member companies reflected a growing interest in building deeper, outcome-driven collaborations with IIT Bombay.

As an ongoing initiative, Infospot aims to facilitate a series of focused conversations that help industry partners better understand and engage with various sections and departments within the IIT Bombay ecosystem.

# STRENGTHENING ENGAGEMENT THROUGH INDUSTRY & ACADEMIC VISITS

Alongside hosting flagship initiatives like Infospot, ASPIRE IIT Bombay Research Park Foundation has continued to see strong engagement through a series of visits from industry leaders, academic institutions, and research organizations.

Over the past few months, ASPIRE welcomed representatives from companies such as Tata Motors, JSW Steel, Tata Steel, Laxmi Organic Industries, and others, who visited to understand the Research Park's model, explore collaboration opportunities, and engage with ongoing R&D efforts.

The Research Park also hosted global academic and research delegations, including TU Wien, University of Illinois Urbana-Champaign, students from Tohoku University, alumni of IIT Bombay, as well as scientists from Defence Research and Development Organisation.

These visits reflect ASPIRE's growing role as a convergence point for industry, academia, and research, enabling stakeholders to gain deeper insights into the Research Park's operational model and the diverse research areas being supported. Research parks like IIT Bombay's are designed to bridge academia and industry by enabling collaborative R&D and real-world application of innovation.

Through such engagements, ASPIRE continues to strengthen its position as a platform for meaningful collaboration, knowledge exchange, and innovation-driven partnerships.


Baker Hughes
Stronger
together
People first,
energy forward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東北大学
TOHOKU


ASPIRE IITB Research Park Foundation


IIT BOMBAY
NANOFABRICATION FACILITY


DEMYSTIFYING
QUANTUM ECOSYSTEM
Algorithms for Leaders

# Our Members


APPLIED MATERIALS
make possible
BHARAT FORGE
KALYANI
BHUKHANVALA INDUSTRIES PVT. LTD.
DEFENCE | NUCLEAR | AEROSPACE
cloudmojo
CORE
Energy Systems Limited
CTECH
A Sine-IITB Company
Deloitte.
DevRev
EMERGY
HONDA
igrenEnerg
InSolare
Solar Power Unleashed
L&T Precision Engineering and Systems
MULTI NANO SENSE
TECHNOLOGIES PRIVATE LIMITED
muRata
nanosniff
NeoDocs
Measure What Matters
RISHABH
KCDD
SustLabs
TEJASE AEROSENSE
UBISOFT
Unilever
hei
RadNet
atomberg
Powai Labs.
isnessing innovation
vcons
ADITYA BIRLA
HINDALCO
TATA
TATA STEEL
antsLAB
INGENERC
Excellence Through Insight
ideaForge
Create. Inspire
Keetup
JSW Steel
ARRDY
B.P.ENTERPRISES
Baker Hughes
Gallagher
Insurance | Risk Management | Consulting
HUBBLEHOX
IFP
Your Sustainable Oil Partner
nuvama
KAYNES SEMICON
KRYSTALVISION
Mercedes-Benz
NEDO
NTT
POGLI
RAJ SPIRIT SUPPLIERS
A CHEMICAL UNIT
TEL
TOKYO ELECTRON
Welspun ONE
TNSQAI
Crafting a New Paradigm For Healthcare
Keetup
ROHM
SEMICONDUCTOR
IHI
INGENERC
Excellence Through Insight
TATA
TATA POWER
ANANTH TECHNOLOGIES
DOLBY
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Proxima
Exports
nuvama
IFB
Industries Limited
Deets
Digital
Your Impact Partner

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# Stay Connected

The Innoverse Grid captures only a part of the broader ecosystem ASPIRE continues to build. For more on our programmes, partnerships, and upcoming initiatives, visit:

**www.iitbresearchpark.com**