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INNOVATIONS @ IITH



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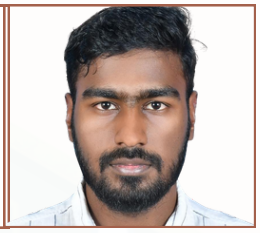
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EDITORIAL EPISTLE

Dear Esteemed Readers,

From the Office of the Dean of Innovation, Translation, and Startups at IIT Hyderabad, I welcome to a special edition of IITH's quarterly e-newsletter किरIITH dedicated entirely to the core engine of our institution: pioneering innovation. India stands at the threshold of a historic entrepreneurial boom, a transformative era whose ultimate success hinges on breakthrough ideas translated into tangible solutions. At IITH, we operate on the firm belief that true innovation requires a hands-on, practical approach to building prototypes, refining designs, and shaping sustainable business models. From day one, our ecosystem blends immersive research and development with a flexible academic curriculum, instilling an entrepreneurial spirit across our campuses and empowering both our ambitious students and esteemed faculty to push technological boundaries.

This vibrant ecosystem is sustained by policies designed to grant our innovators total creative freedom and support India's push for technological self-reliance. Here, first-year BTech students receive direct financial backing to bring early-stage ideas to life, while faculty members are empowered for product development, unburdened by academic publication pressures. To turn these concepts into market-ready realities, IITH hosts four deep-tech incubators equipped with structured mentorship from experts. Furthermore, our state-of-the-art Research Park seamlessly bridges academia and industry, giving resident commercial entities direct access to 345 faculty experts and over 5,700 brilliant young minds, while our Institute Innovation Council and 14 student-led science clubs fuel a constant pipeline of hackathons, robotics challenges, and business skill programs.

In this issue, किरIITH shines a light on the select stories, cutting-edge infrastructure, and passionate individuals driving these breakthroughs, with a special emphasis on their profound societal impact. Within these pages, you will explore how our autonomous navigation testbed (TiHAN) is shaping the future of indigenous drones and self-driving vehicles, how iTIC Incubator supports deep tech innovators, how digital frameworks are reimagining student engagement, and how technology is revitalizing ancient disciplines like Ayurveda. Our feature articles also highlight critical advancements in health, sustainability, and green tech - ranging from healthier urban mobility routing and low-cost sensors for "forever chemicals" to novel wastewater treatments, sustainable farming practices, and even a groundbreaking cervical cancer therapy derived from a common heartburn medication.

Whether examining locally developed lab instrumentation, trash-to-treasure up-cycling, or sustainable practices in filmmaking, this compilation reflects the vast scope and deep commitment of IITH's creative mindshare. I invite you to immerse yourself in this issue, celebrate the transformative work of our innovators.

Warm regards,
Prof. Arabinda Haldar
Issue Editor



Issue Editor

Prof. Arabinda Haldar
Dean - Innovation, Translation & Startups



Prof Mahendra Kumar Madhavan
Dean – Alumni & Corporate Relations



Prof G. Narahari Sastry
Dean - Sponsored Research & Consultancy



Prof. Arabinda Haldar
Dean - Innovation, Translation & Startups



Dr Shuhita Bhattacharjee
Associate Professor
Department of Liberal Arts



Dr Chandra Prakash
Assistant Professor, Department of Mechanical & Aerospace Engineering



Dr Prabhat Kumar
Faculty-in-Charge - Public Relations



Dr Subhojit Kadia
Assistant Professor
Department of Civil Engineering



Dr Ankita Roy
Assistant Professor,
Department of Design



Dr Oves Badami
Assistant Professor
Department of Electrical Engineering



Dr Sonali Srivastav
Assistant Professor,
Department of Design



Dr Bharti Dharapuram
Science Communication Officer



Dr Bhojaraju Gunjal
Chief Library Officer



Mr Vinay Kumar
Public Relations Officer



Cover Page Design by

Ms Nisha
MDes, Dept of Design



Editorial design by

Ms Manjula
Office Executive, PR Office



Dear Friends,

As we present Volume 8, Issue 2 of our newsletter किरIITH, themed "Innovations @ IITH". I am delighted to share yet another chapter in out remarkable journey of excellence, innovation, and global impact.

Over the past few months, IITH has continued to strengthen its position as one of India's leading research-driven institutions. Our significant rise to 588th position in the QS World University Rankings 2027, coupled with our growing global research impact, reflects the dedication of our faculty, researchers, students, alumni, and staff in advancing knowledge that creates meaningful societal impact.

Innovation remains at the heart of everything we do. This issue highlights several landmark achievements, including the launch of the Information Age Museum (IAM IGNITE) to inspire future innovators, the introduction of a specialized programme in Nuclear Energy to support India's clean energy aspirations, and new global industry collaborations that strengthen translational research and technology development.

A key focus of our innovation journey is strengthening the connection between research, industry, and product development. In this direction, IITH is advancing Product-Based PhD programmes, designed to encourage researchers to develop innovative products and processes in close collaboration with industry. I am delighted to inform all of you that 30 Product based PhD fellowships were supported by industry this year at IITH. By bringing together academic excellence and real-world technological challenges, these programmes aim to translate research into solutions that create economic and societal value, contributing to the vision of Viksit Bharat.

Our commitment to future-ready talent also extends to emerging strategic technology domains. The MTech in Defence Technologies, offered through the Centre for Interdisciplinary Programs (CIP), provides opportunities to advance expertise in cutting-edge defence research and technology. Such interdisciplinary programmes strengthen India's indigenous technological capabilities and support the journey towards Atmanirbhar Bharat.

Our vibrant innovation ecosystem continues to produce technologies with global relevance. IITH-incubated startups such as Pure Energy and WiSig Networks showcased indigenous deep-tech innovations at Bharat Innovates 2026 in France, demonstrating India's growing leadership in clean energy, semiconductor technologies, satellite communications, and next-generation connectivity. Their achievements reaffirm our commitment to nurturing entrepreneurship that transforms research into impactful solutions.

This edition also celebrates major strategic collaborations in advanced manufacturing, defence, aerospace, healthcare, mobility, and materials science. Initiatives such as the indigenous development of India's first large-scale 100 kg Gas Atomizer, new industry-supported research centres, and strengthened partnerships with national laboratories and global companies reflect our focus on building technologies that contribute to Atmanirbhar Bharat while addressing global challenges.

Beyond research and innovation, we remain committed to building a healthy, sustainable, and inclusive campus. Recognition under the Fit India Vehicle-Free Campus Initiative, our continued promotion of cycling and sustainable mobility, and outreach initiatives aimed at inspiring school students reinforce our belief that technological progress must go hand in hand with social responsibility and environmental stewardship.

As IITH continues its journey of excellence, we remain committed to fostering interdisciplinary research, nurturing future-ready talent, strengthening industry and global partnerships, and creating innovations that benefit society. Through initiatives that connect education and research with real-world challenges, we aspire to empower the next generation of innovators and contribute meaningfully to the making of a Viksit Bharat.

I hope this issue of किरIITH offers you an inspiring glimpse into the diverse accomplishments of our community and motivates all of us to continue pushing the boundaries of knowledge, innovation, and impact.

Prof B S Murty
Director, IIT Hyderabad

Beyond Organic Products : Where is Ayurveda Innovating Today?



KID: 20260201

Exploring how ancient healthcare systems are being reshaped by technology, regulations, science and entrepreneurship is and why we may need a new way to map it. Innovation in Ayurveda makes us think of a new herbal formulation or a company launching a new ayurvedic based product. But innovations have moved far beyond just this traditional image of Ayurveda. Research is being done in Ayurveda using molecular biology and metabolomics. Scientists are exploring whether Ayurveda's emphasis on individual constitution can be investigated through modern genomic approaches. Ayurvedic consultations are being recorded through digital technologies analyse classical texts and support clinical decision making. Pharmaceutical manufacturers are using new analytical methods to make Ayurvedic medicines more consistent and reproducible.

Ayurvedic knowledge is being utilised by startups working in digital healthcare, biotechnology and new products. Even the systems that regulate, standardize and evaluate Ayurveda are evolving. Collectively these developments prove , Ayurveda is not simple being preserved, It is being transformed. But the bigger question is whether we can see the full picture.

Traditional knowledge to scientific questions

One of the most interesting changes in modern Ayurveda is not the replacement of traditional knowledge with modern science. It is the attempt to ask new scientific questions about knowledge that has existed for centuries. Like in reverse pharmacology , conventional drug discovery often starts with a molecule identified in the laboratory and then investigates whether it could become a medicine. Reverse pharmacology can begin in the opposite direction. An Ayurvedic physician may have observed a therapeutic effect repeatedly in clinical practice. Observation can be taken as a starting point by the researcher then the researcher can identify the potential therapeutic lead, and then investigate it through laboratory studies, safety evaluation and mechanistic research.

The direction of discovery changes.

This creates a bridge between what Ayurveda has observed in patients and what modern biomedical research can measure and explain. A similar bridge is being explored through Ayurgenomics and systems biology. Ayurveda has long emphasized that people differ in their constitution and may not respond identically to the same intervention. Modern research is beginning to investigate such individual variation using genomics and other biological data. Research on concepts like prakriti leads to exploring whether Ayurvedic ideas about individual constitution can be examined alongside genomic variability and other biological characteristics.

Whereas researches are also able to study several layers of biological information with multi omics approaches. The important point is not that genomics has suddenly "proved" an Ayurvedic concept. Rather, Ayurveda is becoming a source of research questions that can be investigated using tools that were unavailable to earlier generations.
That is a very different kind of innovation.

What happens when Ayurveda enters the clinic

Innovation is not only happening in discovering how the medicine works but also changing how ayurvedic treatments are delivered and evaluated. Modern clinical research uses randomized and pragmatic clinical trials, multicentric studies and real world evidence with standardised treatment protocols to evaluate Ayurvedic interventions across diverse patient populations. This does not mean making every treatment identical, but rather creating consistency in what is documented and evaluated while preserving the individualized approach that is central to Ayurveda.

Can technology change how Ayurveda diagnoses ?

Diagnosis is another area where traditional Ayurvedic practice is meeting modern technology. Researchers are exploring digital pulse analysis, biomarkers, imaging and machine learning based tools to capture and support the interpretation of clinical information.

The goal is not to replace the Ayurvedic physician, but to make observations more measurable, comparable and analyzable. This could strengthen research, support clinical decision making and create new possibilities for integrating Ayurvedic diagnosis with modern healthcare systems.

AI in Ayurveda

When we say Artificial intelligence it can sound disconnected from traditional medicine system until we look at the vast textual and clinical knowledge Ayurveda already contains. Natural language processing can help organize and analyse classical texts, making it possible to identify patterns and connections across large bodies of knowledge that would be difficult to examine manually. The same approach can extend to clinical practice. Digital Ayurvedic health records can structure patient histories, treatments and outcomes, diagnosis, allowing this information to be more easily retrieved and analysed. AI could then support prescription analysis, research data mining and clinical decision making. The new possibilities created for Ayurveda will include its accumulated knowledge could become not only readable but also computationally searchable. However this can depend on standardized terminology and interoperable health records. If the same Ayurvedic concept is recorded differently across hospitals then digital systems cannot easily connect the information.

Therefore the challenge is not simply to build AI tools but to make the ayurvedic knowledge within digital healthcare ecosystem.

Medicine looks the same but the manufacturing process behind is not Patients remain unaware of some of the biggest innovations in Ayurveda. A familiar tablet or a capsule may look the same but may now be processes using improved extraction methods or through automated manufacturing processes. Which now has led to ayurvedic formulations be produced at a larger scale with greater consistency.

Chromatographic fingerprinting, mass spectroscopy , DNA barcoding and such technologies prove that quality testing has also evolved. These can help with characterize formulations, identify their chemical components and verify plant materials. These advances improve reproducibility and traceability, helping ensure that different batches maintain consistent quality as Ayurvedic products move towards large-scale manufacturing and international markets.

Regulation innovations

Wider reach and commercialisation of Ayurveda has led to regulation becoming an important form of innovation. Quality certification, standards, clinical guidelines are creating more ways to ensure safety and quality. This helps Ayurvedic innovations become more trustworthy, reproducible and easier to scale.

Ayurveda beyond medicines

Ayurveda's horizons are now moving into functional foods and nutraceuticals, while interdisciplinary education connects it with disciplines biotechnology, engineering, entrepreneurship and more startup culture leading to the development of startup and incubators. Together, these developments are creating new pathways for Ayurveda to reach wider society.

Connecting Ayurveda's innovation ecosystem

Ayurveda is generating innovations across science, clinical practice, pharmaceuticals, diagnostics, digital health , but the developments are scattered across patents, institutions, research papers and companies. This makes it difficult to see who is innovating, which technologies are progressing, where the gaps lie and where opportunities for collaboration exist.

Proposing a innovation atlas of Ayurveda that could bring these pieces together by mapping various domains of innovation including knowledge, pharmaceutical, diagnostic, regulatory, industrial and social adoption. Rather than being just a database, it could become a living map connecting researchers, institutions, industry and policymakers, helping Ayurveda move from isolated innovations towards a more connected innovation ecosystem.

[1] Ms Samhita Kiran
M.Tech. Student, Department of Entrepreneurship and Management

Beyond the Fastest Route: Can We Make Our Journeys Healthier?


[1]


[2]

KID: 20260202

When we open a navigation app, one of the first questions we ask is, "What is the fastest way to get there?" But the shortest may not always be the 'best' route. What makes a route 'best' can vary depending upon the need, choice, context and socio-economic conditions.

In most cases, however, our focus is on reaching the destination in the shortest possible time or by the shortest available route, irrespective of where we are heading towards – be it a school, hospital, market, office, place of worship or any other destination. However, the shortest route may not offer best travel experience every time. It may take us through heavily congested roads or areas with deteriorated air quality, whereas a slightly longer route may provide comparatively better environmental conditions. Thus, the route that appears best in terms of distance or travel time may not necessarily be the best choice from an environmental or health perspective. For people, who travel through the same road every day, these nuances can become increasingly important.

Conventional navigation applications, such as Google Maps, have transformed the way we travel. They help us find routes, estimate travel time and identify traffic conditions, making daily journeys more convenient. However, they primarily help us reach our destination efficiently. **Healthy Route takes a different perspective by asking whether the route can also be assessed from a health and environmental point of view.**

This idea led to the development of **"Healthy Route: Health-Aware Routing Beyond the Fastest Path"**, a health-aware navigation application that considers factors beyond travel time. The app brings together air quality, traffic conditions and user-related health considerations to help users compare alternative routes.

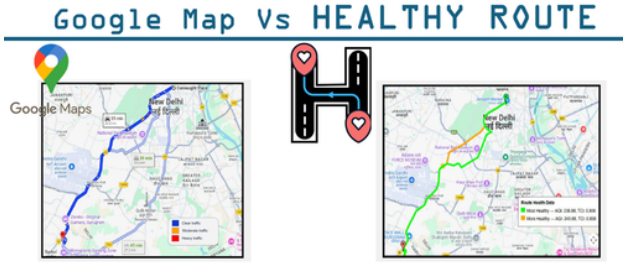


Figure. (A) Google Maps and (B) Healthy Route. While conventional navigation focuses on route and travel information, Healthy Route additionally presents routes from a health and environmental perspective.

Bringing Health to Navigation

The central idea behind Healthy Route is to bring environmental and health parameters into everyday route planning. At the basic level, the system incorporates air quality and traffic conditions while evaluating "healthiness" of different routes. Air quality is represented here in terms of Air Quality Index (AQI), which provides an easy way of understanding the overall quality of air.

Traffic conditions add another important dimension, as the experience of travelling through a heavily congested road can differ considerably from that of travelling along a relatively free-flowing route.

In its advanced version, the app offers more personalized approach to route assement. Instead of treating every traveller in same category, the system can consider user-related information.

A route is also an exposure pathway

Human beings are exposed to air pollution not only through the places where they live or work, but also while travelling through a city. For many people travelling through a city can also constitute a significant part of their daily environmental exposure. Two people travelling between the same locations may experience different conditions depending on the roads they choose. A route through a heavily congested corridor may provide a very different environment from a route through less congested areas. For someone who makes the same journey regularly, these differences can become an important part of their everyday travel experience.

From an idea to a working prototype

Developing Healthy Route involved bringing together the ideas of mobility, environmental conditions and health. The project began with a simple question about conventional navigation: *what if reaching a destination quickly was not the only consideration when choosing a route?*

This led to exploring how information about the conditions experienced during a journey could be incorporated into everyday route planning. The project progressed from this initial idea to a working prototype that brings these different aspects together. One of the challenges was to make this information meaningful and easy to understand way for everyday travellers. Rather than presenting users with complex environmental or health-related information, the app translates these considerations into simple route choices that can be compared.

Towards healthier urban mobility

Healthy Route represents an early step towards a broader vision of health-aware urban mobility. Future development could make the system increasingly responsive to changing environmental and traffic conditions while offering more personalised route assessments. As cities become more crowded and travel patterns become increasingly complex, such approaches could help people consider factors beyond distance and travel time when planning their daily journeys. Perhaps the question we ask our navigation systems in the future will not be only **"How fast can I get there?"**, but also **"What kind of journey will I have along the way?"**

[1] Dr. Ambika S
Assistant Professor, Department of Civil Eng
[2] Ms. Antara Roy
PhD Scholar, Department of Civil Eng

Beyond the Noticeboard: Rethinking How Students Participate on Campus



KID: 20260203

Campuses are full of opportunities, but information about them is scattered across WhatsApp groups, Instagram pages, emails, posters and word of mouth. Students who are new, or who sit outside the right circles, often miss out entirely. Through interviews with club heads and a student survey, I have been exploring whether a campus-specific digital layer could bring opportunities, places and communities into one view. What began as an app idea has turned into a research question about how students discover activities, participate in them, and stay involved afterwards.

There are hundreds of opportunities on a campus, be it in the form of clubs, workshops, competitions, talks, sports or informal communities. But discovering the right one is often more difficult than organizing it in the first place. Information is spread across WhatsApp and Instagram, posters, emails, and personal contacts. For some students, especially those who are new to a campus or have not yet found their own circle, an opportunity can easily be missed simply because they never hear about it.

I first noticed this during my B.Tech. I was involved in different clubs and activities, and I also had the opportunity to observe how similar activities were organised in other colleges. I noticed that participation often depended on something as simple as being in the right group at the right time. During my M.Tech, I started looking at this more closely by talking to club heads and students, conducting interviews, and carrying out a student survey. These conversations made me think beyond just event discovery. I began wondering whether a digital platform could help students discover opportunities, stay involved, and at the same time make it easier for them to navigate the campus and find their place within its communities.

Origin of the idea

The idea started out simply enough: to make the discovery of campus life less of a chore. There was a pattern in campus life that I began noticing during my B.Tech years. Some activities were widely known, while others remained within a small circle. If an aspiring entrepreneur was notaware of such opportunities, they might let a workshop pass them by. A student could be entirely unaware of a competition until it was too late to register, or a photography enthusiast might never know that a community existed. These experiences made me realize how much participation can depend on information reaching the right people.

I set out to look at the problem more closely and spoke with club heads and other students, which put it in a new light. At first, my focus was on the events themselves, but over time I saw an event as merely one stop on a longer journey.

Consider a student who discovers a workshop, attends it, meets like-minded people, joins their community and eventually contributes by organizing something of their own. I began to see this as a journey:

Discover → Participate → Connect → Continue → Contribute

Surrounded by opportunities, yet unable to find them

Most campuses already generate many opportunities. There are technical workshops, cultural activities, sports, competitions, talks and club meetings.

Today, different activities use different channels. One club may post on Instagram. Another may rely on WhatsApp. A department may send an email, while an informal activity may spread entirely through friends. This works reasonably well for students who are already connected to the right groups. It can be much harder for someone who has just joined a campus or has interests outside their existing social circle. A student can therefore be surrounded by opportunities without knowing that they exist. Figure 1 shows how information spreads across these channels and where opportunities get lost.

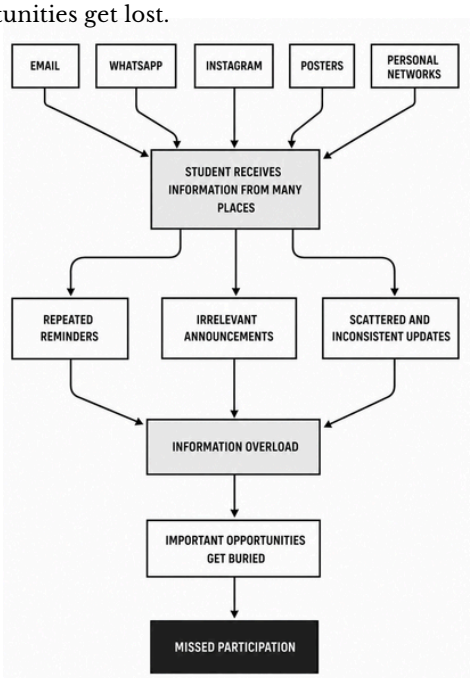


Figure 1. From Fragmented Information to Missed Participation

Campus opportunities reach students through multiple channels, creating repeated reminders, irrelevant announcements and scattered updates. As information accumulates, important opportunities can become difficult to identify.

The platform I am exploring brings these opportunities together based on what may be relevant to a student, rather than requiring the student to know where each piece of information is posted.

The campus beyond the buildings

As I thought more about how students experience a campus, I began thinking about the physical environment as well. A student may know that a laboratory, department or facility exists but still have difficulty finding it or understanding what happens there.

Conventional maps are useful for locating a campus and its major buildings. Inside a large campus, however, students may need more specific information about routes, facilities and places relevant to their daily activities.

This led me to explore a campus-specific guide that treats locations as more than points on a map. A place could be connected to the activities, facilities and communities associated with it. Figure 2 shows how such a layer would sit between the physical campus and the student.

The platform could help students understand what a community does, what interests it is built around and how someone can participate. It would not be about forcing interaction. Instead, it would make potentially relevant communities easier to discover.

What happens after the event?

Another question emerged as the idea developed: **What happens when an event ends?**

An event has a beginning and an end. A useful connection does not necessarily have to.

A student might meet someone during a workshop and never interact with them again. Someone interested in research might want to speak with a senior student but hesitate to approach a stranger. A participant may want to continue learning about a topic but not know whom to contact.

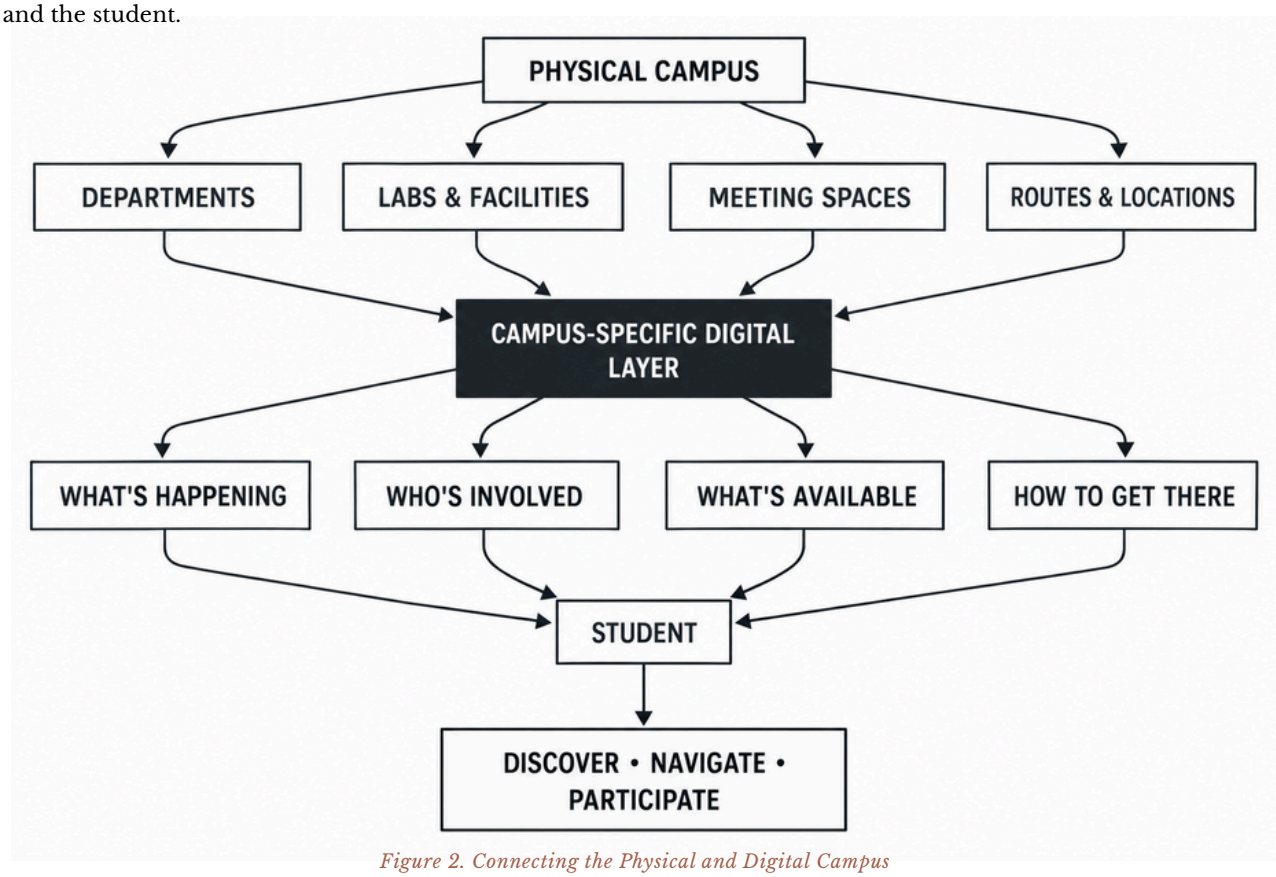


Figure 2. Connecting the Physical and Digital Campus

The proposed campus-specific digital layer connects physical locations with information about activities, facilities and communities, helping students understand what is happening around them, where it is happening and how they can participate.

My experience with clubs raised another question: **What makes a student move from attending an activity to becoming part of a community?**

Students arrive on campus with different social networks. Some find groups quickly. Others take longer. A student may enjoy a club event but still not know how to become more involved. Someone interested in a particular subject may want to meet others with the same interest but not know where to begin.

I began exploring whether the platform could support more structured interactions. Instead of sending an open-ended networking request, a student could indicate that they are looking for a short conversation around a particular topic, while another member of the community could indicate their willingness to help.Whether students would use such a system remains an open research question. That is something I need to test rather than assume.

Can the campus extend beyond its boundaries?

The same problem also appears between institutions. Students already participate in hackathons, competitions, workshops, conferences and cultural events organized by other colleges.

Discovering these opportunities often depends on following the right organization or knowing someone there. This raises the possibility of cross-college opportunity discovery. A student interested in entrepreneurship could discover a relevant event at another institution, while organizers could potentially reach students beyond their own campus.

But several questions remain. Would students travel for opportunities they discover this way? Would organizers benefit from reaching students from other institutions?

Designing for behavior, not just features

One of the biggest lessons from developing this idea is that useful features do not automatically create a useful product. It is easy to build an event listing, map, community directory or messaging system. The difficult part is understanding whether students will use them.

This has pushed my research beyond technology and entrepreneurship and towards questions of behavior. How do students discover activities? What makes them participate? Why do some return while others attend only once? What prevents someone from approaching a new community?

A platform can be technically well designed and still fail if it does not fit the way students behave.

From an app idea to a research question

An app idea has gradually become a research question. As the various elements of the project have started to come together, a pattern has emerged. An event takes place at a location, and a student sees it as an opportunity. Participation brings people together. Some may become part of a community, which in turn can create further opportunities.

It is a cycle that goes something like this:
Places → Opportunities → Participation → People → Communities → New Opportunities
Figure 3 shows this cycle.



Figure 3. A Connected Campus Participation Cycle

The proposed framework views campus participation as a continuing cycle in which places create opportunities, opportunities encourage participation, and participation brings people and communities together, potentially leading to new opportunities.

For now, I find myself with more questions than I do answers. One has to think why a student would opt for another platform given their dependence on WhatsApp and Instagram. Are clubs prepared to put in the work to keep up an additional channel? And as for the students, will they be inclined to engage with opportunities beyond their usual circle or stick to the communities they are familiar with? The mere act of constructing a platform is no answer to that.

So my aim in the coming phase is to put these notions to the test with the campus community and see how the platform is used by both students and clubs. There is a need to keep refining things, to separate what truly has value from what might seem useful on paper but does little to alter student behavior. In a way, an observation has turned into the essence of my research: in what manner can we open up the campus? I do not view a campus as just its classrooms and buildings; it is also the people's communities and the chance encounters that define the experience of being a student there. I am looking to see if a digital medium can be of service in uniting some of this without diminishing what gives campus life its meaning.

This is about more than churning out yet another app. What I want to do is examine a new approach to the digital campus, one that allows students to get their bearings, become involved and put them in contact with people and communities they may never have otherwise found.

[1] Mr Abhiram Ramachandran
MTech Student, Techno-Entrepreneurship
Department of Entrepreneurship & Management

Building the Future of Autonomous Mobility: Inside TiHAN-IITH's Journey from Testbeds to Real-World Solutions

KID: 20260204



Autonomous mobility is often imagined as a distant future—self-driving cars navigating cities, drones flying without pilots, and air taxis transporting people above congested roads. At the Technology Innovation Hub on Autonomous Navigation Foundation at IIT Hyderabad (TiHAN-IITH), that future is being developed through a very practical approach: building, testing and validating autonomous systems in real-world conditions. Established under the National Mission on Interdisciplinary Cyber-Physical Systems, TiHAN

IITH brings together autonomous systems, intelligent connectivity, advanced engineering and safety-focused solutions to address the complex mobility challenges of India. What makes this work particularly significant is its emphasis on Indian conditions. Autonomous systems cannot simply be developed for ideal roads, perfect weather and predictable environments. They must cope with unstructured roads, diverse traffic, poor visibility, GPS-denied environments, industrial sites and difficult terrain. TiHAN-IITH's work brings together testing infrastructure, multimodal datasets, autonomous vehicles, drones, connected mobility and aerial systems to create technologies that are designed for these realities.

From the Laboratory to the Real World

One of the central ideas behind TiHAN-IITH is that autonomy must be validated beyond simulation. The TiHAN Testbed provides a dedicated environment for testing aerial and terrestrial autonomous navigation, combining road infrastructure, intersections, test tracks, hangars, ground control stations, simulation tools and a dedicated aerial test zone, the facility as a 10-acre integrated testbed with multiple multimodal tracks and scenarios.



Figure 1. TiHAN Autonomous Navigation Testbed

This infrastructure allows researchers and technology developers to investigate how autonomous systems behave under controlled but realistic conditions. Signalized and unsignalized intersections, smart poles, V2X communications and environmental emulators create opportunities to reproduce situations that autonomous vehicles are likely to encounter outside the laboratory.

The philosophy is simple but important: an autonomous system is only as useful as its ability to operate safely when conditions are imperfect. That philosophy extends to TiHAN IITH's advanced testing facilities. The Rainfall Simulator can reproduce varying rainfall intensities, while the Wind Shaper Facility enables controlled dynamic wind testing for UAVs and eVTOL platforms. The Control Drone Navigation Testing Centre provides an indoor environment for testing navigation in GNSS-denied and obstacle-rich conditions. The eVTOL Propulsion and Motor Testing Lab support evaluation of electric propulsion systems, including thrust, efficiency and endurance. Together, these facilities create something more valuable than an individual laboratory: an ecosystem in which autonomous technologies can be tested across multiple dimensions of real-world operation.

TiHAN-IITH addresses this through TiAND—the TiHAN-IITH Autonomous Navigation Dataset.

Autonomous systems depend on data. A vehicle or drone must recognize its surroundings, understand what is happening and make decisions based on that understanding. But a major challenge is that much of the world's autonomous navigation research has been built around datasets collected in environments that do not fully represent India's roads, traffic patterns and operating conditions. TiAND is described as a multimodal dataset designed for autonomy on unstructured Indian roads and includes terrestrial, aerial, underwater and agricultural data. It combines information from cameras, LiDAR, RADAR, GNSS and other sensing systems.

The breadth of the dataset is particularly noteworthy, more than 250 hours of recorded data across multiple weather conditions and more than 50 cities, together with 125,000 images and 45,000 point-cloud files. The data covers 26 object classes and synchronized multisensor information.

This creates an important foundation for researchers developing perception, localization, planning and autonomous decision-making systems specifically for Indian environments. The significance goes beyond the size of the dataset. Diverse data makes it possible to study the unusual and unpredictable situations that often determine whether an autonomous system succeeds or fails. In autonomy, the difficult cases—the sudden obstacle, unusual road user, poor lighting or unexpected interaction—can matter more than thousands of routine examples.

Autonomy Beyond the Road

While autonomous cars are an important part of the work, TiHAN-IITH's vision extends across multiple modes of transportation. Its autonomous campus shuttle demonstrates how autonomous mobility can

be deployed in controlled environments. The system integrates perception, navigation and control and includes LiDAR-enabled perception, prediction and detection, multisensor fusion, fail-safe mechanisms and an in-house drive-by-wire system. The shuttle has been operational since August 2023 and reports more than 30,000 passengers served, with a 95% satisfied-user figure. Connected mobility is another important part of the ecosystem. TiHAN-IITH's C-V2X communication platform connects vehicles, roadside infrastructure, traffic signals and cloud systems. Applications include pedestrian detection, collision avoidance and emergency-vehicle green corridors.

The system is designed around low-latency communication, high reliability, real-time data exchange and secure connectivity. This reflects a broader understanding of autonomy: the future vehicle will not operate as an isolated machine. It will increasingly communicate with infrastructure, other vehicles and digital services.



Figure 2. TiHAN Autonomous Campus Shuttle

Taking Autonomy into the Air

The aerial portfolio demonstrates perhaps the widest range of operating challenges. TiHAN-IITH has developed surveillance, precision-delivery, GPS-denied navigation and heavy-payload platforms.

Ti-Shadow is an autonomous surveillance UAV designed for real time aerial surveillance and situational awareness. It can be equipped with thermal and advanced surveillance payloads for day-and-night operations. Its autonomous capabilities enable reliable, intelligent and secure surveillance missions with minimal human intervention.

For environments where satellite navigation cannot be relied upon, TiHAN-IITH has developed an outdoor and Indoor GPS-denied autonomous navigation drone to operate inside industrial plants, warehouses, tunnels, boilers and mines. These systems demonstrate an important transition: drones are moving from remotely operated machines toward autonomous platforms capable of perception, localization, navigation and mission execution.



Figure 3. TiHAN SHADOW – Surveillance Drone

From Small UAVs to Heavy Payloads and Human Transport

The same technological foundation is being extended to much larger aerial systems. Ti KALA is presented as a precision air-drop platform with autonomous navigation and high accuracy payload release.

It is intended for applications ranging from defence and disaster response to delivery in remote areas. At the heavier end, Ti-Chakravyuh is a higher altitude UAV designed to transport more than 100 kg of payload with redundant communication capabilities.



Figure 4. TiHAN GPS Denied Drone

Its applications include defence logistics, industrial transportation, emergency services and remote-area cargo delivery. The most ambitious application is Ti-Palyanka, a personalized aerial vehicle designed for human transport, emergency response and urban air mobility.

The platform is presented with a 100 kg payload capacity, safety redundancy and autonomous/manual operating modes. The drone specifically highlights emergency landing decision-making and fail-safe mechanisms designed to tolerate single and dual motor failures.

This progression—from surveillance drones to heavy-payload aircraft and ultimately human-carrying aerial mobility—illustrates how autonomous navigation technologies can scale across increasingly demanding applications.



Figure 5. Ti CHAKRAVYUH on Flight

Building an Ecosystem, Not Just Products

Perhaps the most important aspect of TiHAN-IITH's work is that these technologies are not presented as isolated products. They form part of a larger ecosystem involving datasets, test infrastructure, connectivity, simulation, autonomous vehicles, UAVs, propulsion systems and software. The Software Defined Vehicle initiative further reflects this systems-level approach. By separating vehicle intelligence from hardware through modular software architectures, the platform aims to enable continuous feature development, secure over-the-air updates, connectivity and AI-ready capabilities. Similarly, the indigenous Ti-Circle flight controller and TiHAN Fly Ground Control Station point toward greater control over the software and hardware stack for autonomous UAV operations, capabilities including autonomous navigation, fail-safety, BVLOS and swarm operations.

Communication resilience is another critical piece. TiHAN-IITH's anti-jamming telemetry system addresses the vulnerability of single-frequency links by incorporating adaptive frequency hopping, secure encryption, replay protection, long-range communication and onboard intelligence.

What Comes Next?

The future of autonomous mobility will not be defined by one vehicle, one sensor or one algorithm. It will depend on how well different technologies work together—and how reliably they perf[illegible] outside controlled laboratory conditions. TiHAN-IITH's approach points toward that future: collect representative data, build intelligent systems, test them in increasingly demanding environments, validate their safety and then translate the results into deployable solutions. The opportunities are equally broad.

Urban air mobility, autonomous logistics, disaster response, industrial inspection, agricultural monitoring, connected transportation and human aerial mobility all require reliable autonomy. The challenge is to transform technological capability into systems that people can trust. That is ultimately what makes TiHAN-IITH's work important. It is not simply about imagining a future filled with autonomous vehicles. It is about building the infrastructure, data, engineering capability and validation ecosystem required to make that future possible.

> *The journey is about experiencing innovation and embracing tomorrow. Its growing portfolio suggests that tomorrow's mobility will not belong to a single mode of transport. It will be connected, autonomous, intelligent—and increasingly designed around the realities of the world in which it must operate.*

[1] Prof. P. Rajalakshmi
Professor, Department of Electrical Engineering,
Director - NMICPS TiHAN Foundation

Design and Fabrication of a 3-Channel DC Laboratory Bench Power Supply



KID: 20260205

A reliable power source is essential for modern electronics laboratories, research and prototyping. This project presents a versatile 3-channel regulated DC power supply combining two high-power adjustable SMPS channels (1.3 V – 35 V, up to 10A) with an ATX-based channel providing fixed 3.3 V, 5 V, 12V, and -12V. The outputs can operate independently in series for high voltage or in parallel for high current. Built without a microcontroller, the system relies on discrete control, switching regulator, feedback and hardware protection. Integrated current limiting, short-circuit protection, thermal protection, and real-time monitoring ensure safe, reliable, and efficient operation, making the power supply well-suited for both educational and professional applications.

The design of the 3-channel lab bench power supply (PARAMSAKTHI) was based on the requirement for a compact yet powerful laboratory instrument capable of handling a wide range of experimental conditions. The system combines commercially available switching power modules with custom-designed protection circuits. The first two channels use 36V/10A, 300 W SMPS units as their primary power sources. These modules convert the AC mains supply into a regulated 36V DC. Unlike conventional transformer-based linear supplies, SMPS technology uses high-frequency switches and pulse width modulation (PWM), allowing efficient power conversion with reduced size, weight and heat generation.

System design

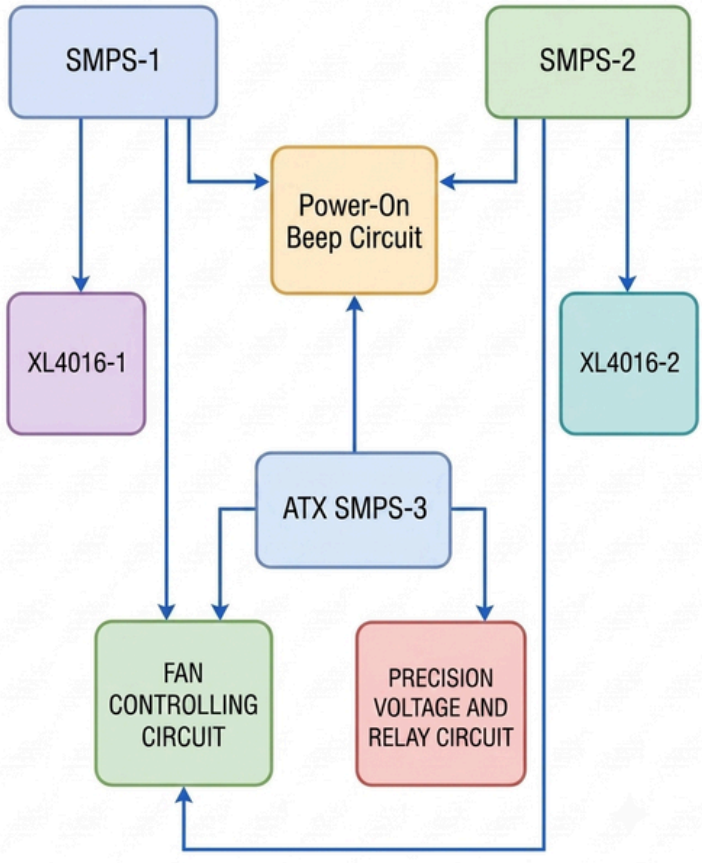


Figure 1. Block diagram of a 3-channel lab bench power supply

The 36 V output is supplied to XL4016 buck converter modules, which step the voltage down to the required output level. The XL4016 regulates the output through high-frequency PWM and provides adjustable voltage and current control. The outputs can range from approximately 1.3 to 35 V, with a current capability of up to 10A. Multiturn potentiometers are used to precisely adjust voltage and current. This arrangement provides fine control and is particularly useful in experiments where a small change in supply can influence device behaviour.

The channels 1 and 2 provide independently adjustable voltage and current outputs. Their independent operation allows two different circuits or experimental loads to be powered simultaneously. When correctly configured, the channels can also be combined in series or parallel to extend the available voltage or current range.

Channel 3 uses an 800W ATX SMPS, a power module commonly used in computer systems. The ATX supply provides several regulated voltage rails, including approximately 3.4V/20A, 5V/30A, 12V/25A and -12V/0.5A. These fixed outputs are useful for digital circuits, motors, actuators and electronic components.

The rotary switch and relay selection circuit for channel 3 was designed to enable selection between multiple fixed-voltage rails and the precision-voltage output. This circuit ensures that only the desired voltage output is connected to the load while keeping other outputs isolated, providing both safety and operational flexibility.

Precision voltage control and monitoring
To extend the power supply's functionality, a precision voltage-generator circuit was developed for low-voltage applications. The circuit provides an adjustable output of approximately 0.1- 2.5V, making it suitable for sensitive load testing.

The circuit uses an operational amplifier as the voltage controller and an IRF540N N-channel MOSFET as the pass element to supply higher currents while maintaining precise regulation. A feedback network regulates the output voltage, while resistive and capacitive components contribute to gain control and circuit stability. This design allows incremental voltage steps of 0.1 V, providing fine-tuned control over the output, even under varying load conditions.

It also incorporates dedicated digital voltage and current displays for real-time monitoring. These displays allow users to verify the selected voltage, observe load current variation and identify abnormal operating conditions during experiments.Thermal management is handled by an automatic fan control module, which employs a relay driver circuit and a 7805-voltage regulator. This system activates the cooling fans only when any output channel is switched on, optimizing energy efficiency and prolonging fan lifespan. Furthermore, a power-on beep indicator circuit utilizing a BC547 transistor was included to provide an audible confirmation of system startup, improving operational feedback for the user.

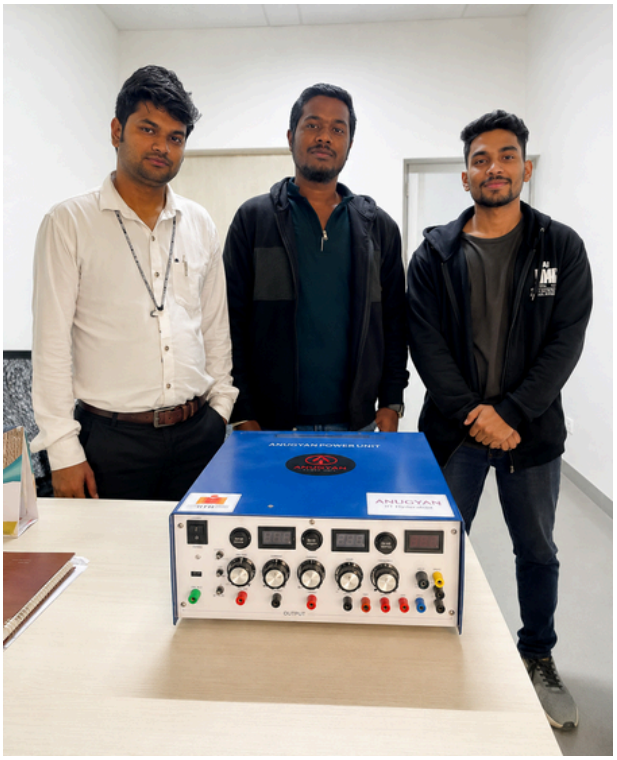


Figure 2. A 3-channel DC power supply built by MSc (Physics, 2024-26) students (Mr. Soham Sahu, Mr. Krushna Chandra Mahali, and Mr. Kruttibasa Danduasi)

To deliver a professional and user-friendly interface, the system incorporates digital display modules that continuously show real-time voltage and current readings for each channel. In addition, LED indicators indicate power status, channel activation, and fault conditions, providing clear and immediate visual feedback.

Development Challenges:
The development involved several practical challenges related to voltage regulation, thermal management, PCB modification, component failure, and circuit integration, which were eventually resolved.

Outcome and Future Scope
The completed 3-channel DC lab bench power system successfully integrates two adjustable high-current channels and a multi-rail fixed-voltage channel into a single laboratory instrument. The combination of adjustable outputs, high current capability, precision voltage generation, real-time monitoring, protection circuits, and thermal management provides considerable flexibility for lab applications.

The project also provided practical experience in power electronics, switching regulation, feedback control, circuit integration, testing and troubleshooting. Importantly, the system achieved its core functionality without a microcontroller or sophisticated digital control system, relying primarily on switching converters, feedback circuits and relays.
Future versions could incorporate microcontroller-based control, programmable voltage and current settings, digital data logging, USB communication, and wireless monitoring. Temperature sensors could enable intelligent fan-speed control and automatic thermal shutdown. Programmable voltage profiles could also allow voltage ramps or pulses for automated testing.

[1] Mr Soham Sahu, Mr Krushna Chandra Mahali, Mr Kruttibasa Danduasi
MSc Students, Department of Physics
[2] Dr Mahesh Peddigari
Assistant Professor, Department of Physics

From Research to Real-World Impact: Inside iTIC-IITH's Journey of Building India's Deep-Tech Ecosystem



KID: 20260206

When people talk about innovation, they often imagine a single, dramatic moment: a researcher staring at a laboratory bench as a breakthrough technology comes to life. But for those of us working closely with founders and scientists every single day, we know that initial breakthrough isn't the finish line - it is barely the starting line. Taking a promising scientific concept, turning it into a tangible product, building a viable business around it, and ultimately deploying it where it can solve real human problems requires an entire ecosystem capable of sustaining deep, complex work long after the excitement of the initial discovery wears off.

At iTIC Incubator, creating and nurturing that exact ecosystem has been our single-minded focus for the past ten years. Founded in 2015 by IIT Hyderabad as a non-profit organization, iTIC was designed to bridge the gap between academic ingenuity and entrepreneurial execution. Today, we have supported more than 240 startups across every phase of growth - generating over INR 1,400 crore in revenues, creating more than 1,100 high-value jobs, and sanctioning over INR 10 crore in direct funding. Yet, as impressive as these numbers are, they are merely indicators of a much larger mission: helping transformative technologies move off the lab bench and into the real world.

The Hard Work of Commercializing Science

The leap from academic research to market enterprise is notoriously difficult in deep tech, where turning a discovery in quantum mechanics, robotics, or materials science into a market-ready solution requires navigating intellectual property, prototype validation, customer discovery, capital deployment, and complex sales cycles. This is why we view incubation as comprehensive ecosystem engineering rather than simply renting out desks or hosting pitch events. Our job is to surround deep-tech founders with specialized physical infrastructure, software tools, legal guidance, capital, and hands-on operational mentorship so they never have to pause technological progress to independently piece together a support network. Crucially, we connect them directly to the research capacity of IIT Hyderabad, alongside our global network of investors, corporate partners, and government channels. Our underlying philosophy is straightforward: if a technology holds genuine potential to solve a meaningful problem, it deserves a clear, structured pathway to market viability.

Navigating the Convergence of Emerging Tech

The portfolio of companies emerging from iTIC spans Artificial Intelligence, Generative AI, Quantum Computing, Digital Twins, Robotics, Cybersecurity, Advanced Materials, Biotechnology, Industry 4.0, Drones, and Next-Gen Communications.



Figure 1. iTIC organised Founder's Meet

What excites me most right now is how these fields are colliding: AI is integratings into autonomous robotics, digital twins are reshaping heavy industry, advanced materials are unlocking clean energy breakthroughs, and synthetic biology is merging with computational engineering. With IIT Hyderabad's interdisciplinary strengths, our community sits in a unique position to lead this shift, but technology cannot stay trapped in an academic bubble. If a solution remains technically brilliant but commercially isolated, we haven't done our job; real impact happens when technologies are validated by industry and adopted by markets at scale.

Defining the Next Decade of Deep Tech

As we look toward the next phase of Indian innovation, the defining question for the next ten years cannot simply be how many startups we can incubate, but how effectively we can translate India's world-class research talent into globally competitive enterprises. Achieving this requires us to redefine success beyond quick revenues or fast valuations to include technological maturity, robust IP portfolios, strategic industrial adoption, global competitiveness, and societal impact. India has never had a shortage of brilliant ideas; what we need are stronger, more resilient pipelines that convert those ideas into scalable enterprises.

At iTIC, our first decade was about laying the foundation, and the decade ahead is about scaling our impact to see more lab discoveries reaching end users, more researchers taking the leap into founding companies, and more Indian deep-tech solutions setting global benchmarks.



Figure 2. Greenko BUILD Program Launch

[1] **Mr Keyur Punjani**
COO, iTIC, IIT Hyderabad

Growing a Greener Future: Exploring Sustainable Agriculture Through Science and Technology


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KID: 20260207

Background

Climate and agriculture have always been linked. It relies on rainfall, temperature, soil, water and healthy ecosystems, but farming itself also influences the environment. As farmers face changing weather patterns, increasing pressures on resources and the need to sustain food production, this relationship is becoming increasingly important. Rice is a particularly interesting crop in this context as its cultivation involves complex interactions among water, soil, nutrients and crop management. Studies have shown that rice systems can be important sources of methane and nitrous oxide, with fertilizer and water management playing an important role in determining emissions.

At IIT Hyderabad, we are addressing these challenges through a tool we have developed called CarbonKrishi. Developed by members of the GREENS Lab, CarbonKrishi is a research initiative that integrates agriculture, environmental assessment, data science, and geospatial technologies. The larger goal is to gain a better understanding of the impact of various agricultural methods on environmental results and how scientific information can finally be translated into useful insights for sustainable farming. The work is being developed around rice cultivation but keeping the possibility of application of the research approach to other agricultural systems in the future.

Understanding agriculture beyond a single indicator

When we talk about sustainable agriculture, we often fixate on a single measure, such as greenhouse gas emissions. But agricultural systems are far more complicated. One environmental impact of a farming practice may be reduced, but another may be affected.

Fertilizer use, for example, is important to keep crop productivity up, but the environmental outcomes are influenced by fertilizer type and amount, soil conditions, irrigation practices and crop management. One of the scientific approaches we use to understand these interactions is Life Cycle Assessment (LCA). LCA is a systematic method for assessing the environmental impacts of a product or process throughout its life cycle.

The methodology is internationally standardized by ISO 14040 and ISO 14044, which provide the principles, framework, requirements and guidelines for LCA studies. LCA provides us with a basis to look at agricultural systems with a range of environmental indicators rather than just looking at climate impact. We are investigating alternate rice production practices and examining how modifications in inputs and management can affect environmental performance.

Bringing data and technology into the picture

One of the problems with detailed environmental assessment is that it can require a lot of data, computing effort and technical expertise. Here is where our interest in data-driven approaches comes in. We are investigating how Machine Learning (ML) and other computational methods can enhance traditional environmental assessment. Agricultural systems produce a wide variety of data sets, such as fertilizer, irrigation, soil, weather and crop information. Machine Learning offers the chance to find patterns in these datasets and to examine links between conventional agricultural methods and environmental results.

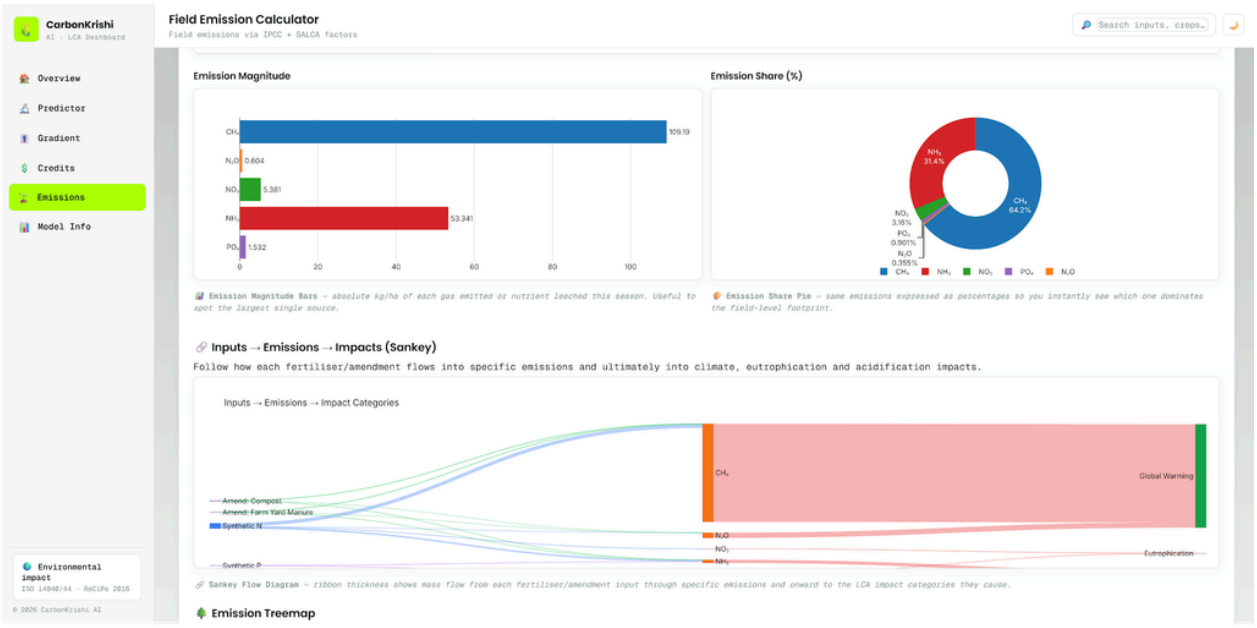


Figure 1. CarbonKrishi Portal

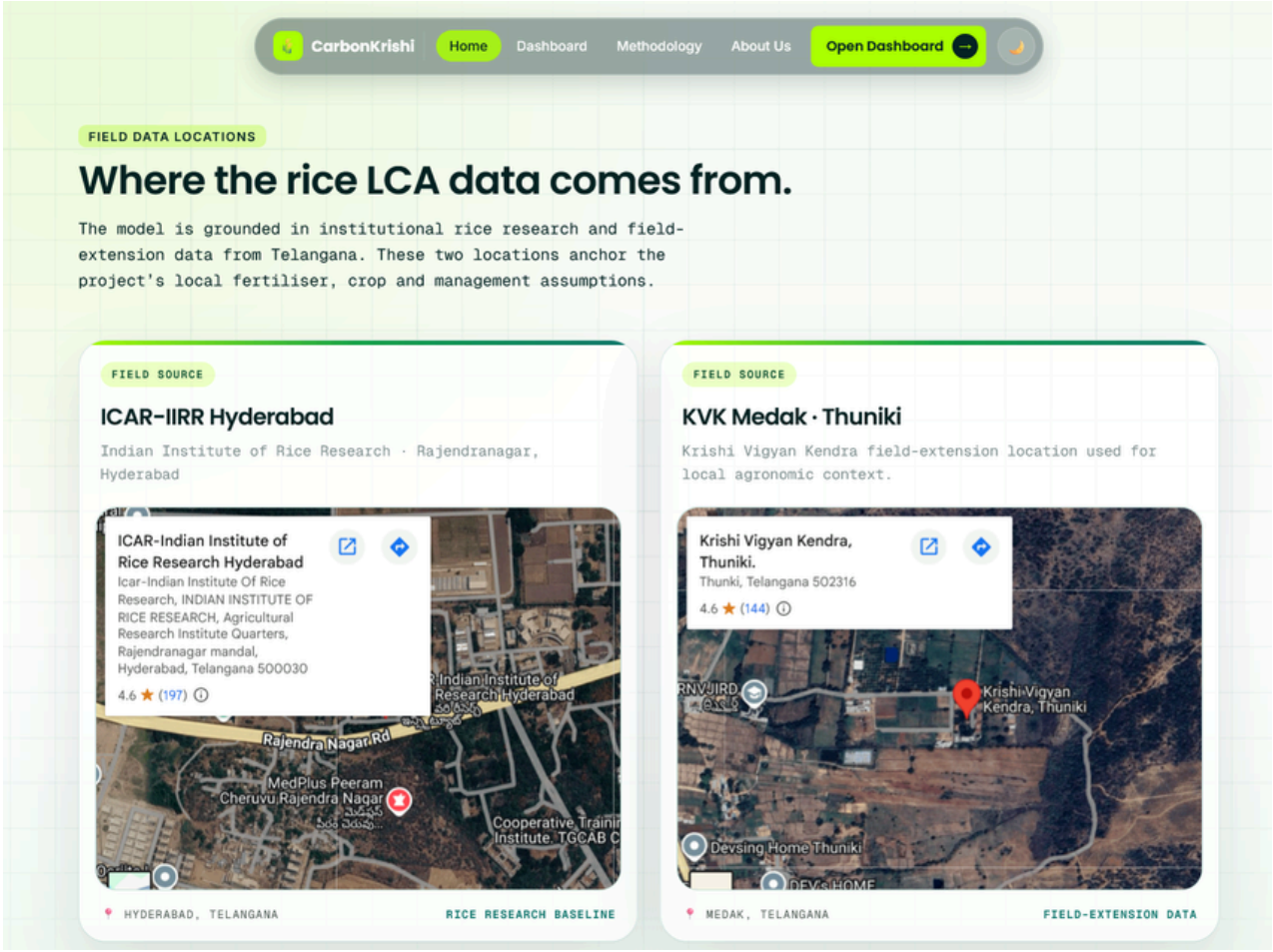


Figure 2. Data Sources for the model development

We are currently focused on building and testing the underlying research framework. We are looking at different data sets, environmental assessment methods and computational approaches to figure out what information is most useful and how these different parts can be put together. The emphasis is on the development of sound scientific knowledge rather than the use of technology as a substitute for field knowledge. Field-based knowledge is vital because agricultural systems are highly variable depending on local soil, climate, water availability and management practices. We are working with ICAR-Indian Institute of Rice Research (ICAR-IIRR), Hyderabad and Krishi Vigyan Kendra (KVK) Medak to incorporate field based information into our research and using Geographic Information System (GIS) tools to understand the spatial context of conventional agricultural methods.

From environmental assessment to better understanding: The main idea of CarbonKrishi is to bring environmental research and the actual decisions that farmers make. Farmers and the people who help them make decisions about things like fertilizers and irrigation and how to manage their crops. They think about how money these things cost and whether they can get them. They also think about the conditions. What about the effect on the environment? This is also very important when making these decisions. So, we do research to see how the environment and farming and money are all connected. We want to understand the ways that farmers manage their land.

This is especially important for people who grow rice. The way they use nutrients and water can affect the air and the environment. It can also depend on the conditions where they are farming like the local weather and soil. CarbonKrishi is really focused on this because it can make a difference, in how rice is grown.

CarbonKrishi is an evolving research effort at IIT Hyderabad, bringing together environmental science, agricultural data, and emerging technologies to better understand sustainable farming practices. While our current focus is on rice, we hope this work will contribute to broader efforts towards climate-resilient, resource-efficient, and sustainable Indian agriculture.

[1] Mr Rahul Kumar Yadav
Research Scholar, Department of Civil Engineering
[2] Mr Jayesh Singh
Research Scholar, Department of Civil Engineering
[3] Dr Ambika S
Assistant Professor, Department of Civil Engineering

Heartburn Pill Turned Cancer Fighter: How Scientists Are Using Omeprazole- Au/Cu Nanoparticles as a Trojan Horse Against Cervical Cancer


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KID: 20260208

Abstract
Researchers in India have repurposed omeprazole, a common heartburn drug, to help turn copper into a cancer-killing weapon. They built a nanoparticle with a copper core, a gold shell, and an omeprazole payload, then tested it on cervical cancer cells in the lab. Omeprazole traps toxic copper inside cancer cells, while the gold shell adds heat (via laser) and boosted radiation damage. Combined, these effects outperformed any single treatment alone. The work is early stage and lab-based, but points to a low-cost way to make existing therapies hit harder.

Why cervical cancer still needs better tools
Cervical cancer is curable when caught early, yet many patients still relapse, and surgery, radiation, and chemo each have limits. Cancer cells are especially sensitive to copper overload, making copper nanoparticles an attractive research target but too much copper can also harm healthy tissue. Scientists needed a way to concentrate copper's toxicity inside cancer cells only.

An unlikely partner: the heartburn drug
Omeprazole, a decades-old, cheap, FDA-approved acid-reflux drug, also blocks a protein cells use to pump out excess copper. Researchers at the Indian Institute of Technology Hyderabad realized that pairing copper delivery with omeprazole's blocking effect could trap toxic copper inside cancer cells and layered in heat and radiation therapy on top.

Building a three-in-one nanoparticle
The nanoparticle has a copper core (releases toxic copper ions), an omeprazole payload (blocks the cell's copper-export pump, trapping the metal inside), and a gold coating that does double duty: absorbing laser light to generate cell-damaging heat (photothermal therapy), and acting as a radiosensitizer that makes cells more vulnerable to radiation, allowing lower doses. One particle thus combines four attack mechanisms.

What the lab tests showed
In cervical cancer cells, the nanoparticles were readily taken up, and combining them with light and radiation produced a stronger anticancer effect than any single treatment alone, while aiming to keep copper toxicity localized rather than spread throughout the body.

From an old drug to a new idea
Rather than developing a new drug from scratch, the team repurposed an existing, already-safe medicine, a strategy called drug repositioning that can save years of development and testing. Pairing it with a multi-mechanism nanoparticle reflects a broader shift in cancer research toward "multitool" treatments that attack cancer from several angles at once.

What comes next
This is cell-culture research only. Next steps include animal testing to confirm the effects hold up in living systems, tracking how the particles move through and clear the body, and fine-tuning dosing to balance cancer-killing power against safety. If successful, this could offer a new, low-cost treatment option built from a familiar drug and clever engineering rather than years of new drug discovery.

> *Based on: Eswar et al., "Omeprazole-Loaded Gold-Coated Copper Nanosensitizers for Photothermal-Radiotherapy of Cervical Cancer Cells," ACS Applied Nano Materials, 2026.*

[1] Prof. Aravind Kumar Rengan
Professor, Department of Biomedical Engineering

[2] Ms. Kalyani Eswar
Research Scholar, Department of Biomedical Engineering

Revitalizing Spent Solvents: A Sustainable Path to Waste Reduction




KID: 20260209

Solvent extraction techniques are widely adopted to separate and recover valuable materials. Over time, however, the solvents used in these processes begin to degrade, creating a mixture of useful organic compounds and unwanted by-products. Managing these spent solvents is an important challenge, as the accumulation of degradation products can reduce process efficiency and increase waste generation. One of the key solvents used in the extraction processes are organophosphates. Various degradation products formed during the extraction process can interfere with solvent performance by altering extraction behavior, promoting undesirable interactions with metal ions, and reducing the solvent's ability to be reused efficiently. Traditional methods for treating spent solvents often involve extensive washing procedures or destructive treatment techniques. Although these approaches help remove contaminants, they may also result in the loss of valuable solvent components, reducing the overall sustainability of the process. To address this issue, our work explores an innovative Size and Other Properties - Based Selection and Exclusion Based Membrane Separation.

In this approach, the degradation products are first selectively bound to a suitable agent. The resulting compounds are then removed using membrane-based separation technology, allowing the valuable solvent fraction to be retained and recovered. By targeting only the undesirable components, this method aims to maximize solvent reuse while minimizing waste. The proposed strategy offers a promising pathway towards more sustainable extraction strategy. By improving solvent recovery and reducing the generation of secondary waste, it contributes to both environmental protection and resource conservation. As industries continue to seek cleaner and more efficient technologies, such innovative separation methods could play a key role in shaping the future of spent solvent waste management.

When Chemistry Meets Membrane Technology

The spent solvent investigated in this study is composed mainly of organophosphates and a diluent, along with smaller amounts of degradation products. Although present in relatively low concentrations, these degradation products have a significant impact on solvent performance and therefore need to be removed efficiently. The proposed treatment method follows a simple but innovative sequence:



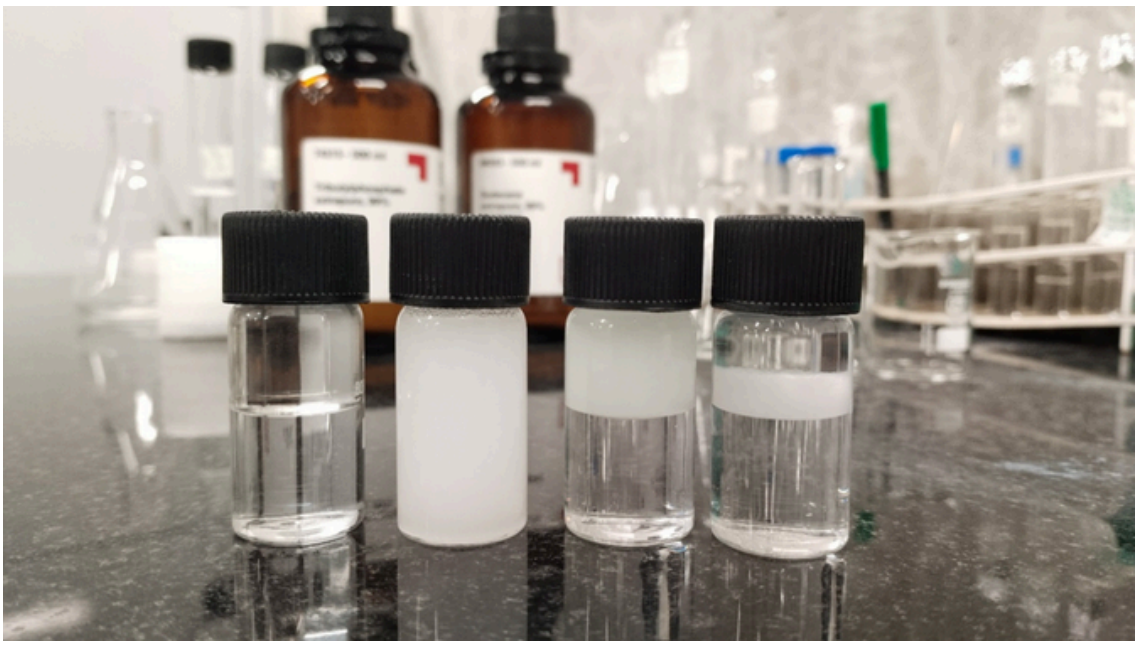


Figure 1. Size and Other Properties Based Selection and Membrane Separation

Membrane Materials and Filtration Approaches

The success of the proposed method is critically dependent on the selection of suitable membrane materials and filtration mechanisms. Because this approach integrates size and other properties-based selection and separation, membrane selection must consider not only pore size but also chemical resistance, solvent compatibility, hydrophilicity, surface properties, fouling resistance, and interactions with degradation by-products. Both polymeric and ceramic membranes represent promising candidates for this application. Polymeric membranes such as polyethersulfone (PES), polysulfone (PSF), polyvinylidene fluoride (PVDF), and polytetrafluoroethylene (PTFE) offer advantages including low cost, ease of fabrication, and tunable pore structures. However, their long-term stability and resistance to swelling in solvent systems require careful evaluation. In contrast, ceramic membranes based on alumina (Al_2O_3), zirconia (ZrO_2), titania (TiO_2), silica (SiO_2), and silicon carbide (SiC) provide superior chemical, thermal, and mechanical stability and are therefore attractive for operation in aggressive solvent environments. In particular, Al_2O_3-supported ZrO_2 or TiO_2 selective layers offer a robust membrane architecture with controllable surface chemistry and excellent opportunities for surface functionalization. Further enhancement may be achieved through the development of functionalized, hybrid, and mixed-matrix membranes incorporating hydroxyl-, amine-, phosphonate-, or other ligand-containing groups, as well as inorganic nanoparticles such as ZrO_2, TiO_2, Al_2O_3, and SiO_2. From a process perspective, microfiltration (MF), ultrafiltration (UF), nanofiltration (NF), and organic solvent nanofiltration (OSN) are potential separation platforms. Consequently, MF and UF are proposed as the primary laboratory-scale technologies for initial membrane screening and process optimization.

Reactor Development

The performance and scalability of the proposed separation process will also depend on the design of an appropriate reactor configuration. Initial membrane screening studies can be performed using a stirred dead-end flat-sheet membrane cell, where the feed solution is continuously mixed and pressure-driven permeation is used to evaluate membrane flux, pollutant rejection, and solvent recovery. This configuration is simple, requires relatively small feed volumes, and allows rapid comparison of different membrane materials and operating conditions. For long-term performance assessment and scale-up investigations, cross-flow flat-sheet membrane reactors or batch-recirculation systems consisting of a feed reservoir, circulation pump, membrane module, and retentate return loop can be constructed. Such systems will enable detailed evaluation of concentration polarization, membrane fouling, flux decline, operational stability, solvent recovery efficiency, and repeated-use performance. The outcomes of these studies will provide critical engineering data required for the development of a practical and scalable membrane separation process for selective pollutant removal and efficient solvent recovery.

Towards a More Sustainable Future in Spent Solvent Management

As the demand for cleaner and more efficient industrial processes continues to grow, the need for sustainable solvent management has become increasingly important in various sectors. Spent solvents not only contain unwanted degradation products but also retain valuable components that can be recovered and reused. Developing technologies that can selectively remove contaminants while preserving useful materials is therefore essential for improving both economic efficiency and environmental sustainability. The approach explored in this work combines the strengths of chemistry and membrane technology to address this challenge. By selectively binding degradation products and separating them from the solvent stream, the process aims to recover a larger fraction of reusable solvent while reducing the amount of material that must be treated as waste. Unlike conventional treatment methods, which may result in the loss of valuable solvent components, this strategy focuses on retaining resources and maximizing their useful lifetime. An additional advantage of this method is its potential to reduce the generation of secondary waste. Minimizing waste production is a key objective in modern industrial operations, as it lowers disposal requirements and supports environmentally responsible practices. The ability to regenerate and recycle solvents can also contribute to more cost-effective process operations and improved resource management. Beyond its immediate application in the extraction processes, the concept highlights how innovative separation technologies can be used to solve complex industrial challenges. Although further investigation and optimization are required, the preliminary concept offers an encouraging pathway toward next-generation solvent recovery systems. As advances in materials science, membrane engineering, and chemical separation continue to emerge, such technologies could play an important role in enhancing process efficiency, reducing environmental impact, and supporting the long-term sustainability of various industries. Ultimately, transforming spent solvents from a waste management challenge into a recoverable resource represents a significant step toward a more circular and sustainable future.

[1] Ms Anjana Jayakumar
Research Scholar, Department of Civil Engineering

[2] Dr Ambika S
Assistant Professor, Department of Civil Engineering

Save Our Species: A Stop-motion Animation Film with Nature



KID: 20260210



Figure 1. Official Poster for Save Our Species

Save Our Species is a stop-motion animation film that explores the harm inflicted on the planet's species through human activities such as poaching, pollution, deforestation, and industrialisation. Figure 1 shows a poster of the film. The film was conceived not only as an environmental narrative but also as an experiment in sustainable animation practice. The species depicted in the film were intentionally designed using elements from nature, while discarded and human-made materials were used to represent the industrial environments and threats surrounding them. In doing so, the materials blending into the storytelling. This project also emerged from an educational experiment in which animation was introduced to first-year Bachelor of Design (BDes) students who had no prior experience in animation. Rather than teaching animation exclusively through software and conventional production methods, the project encouraged students to explore movement, storytelling, materiality, and sustainability through a hands-on sustainable stop-motion production process.

Stop-Motion Animation as a Material Practice

Animation today is frequently associated with digital technologies. A typical 3D animation workflow may involve modelling characters and environments, texturing, rigging digital characters, setting up virtual cameras and lighting, animating movement, rendering, and finally compositing and editing the footage. Such workflows offer enormous creative possibilities, but at times, these processes can create an emotional distance between the designer and the material being created. Stop-motion animation offers a very different experience. It is one of the classical forms of animation in which physical objects, puppets, sets, and materials are moved incrementally and photographed one frame at a time to create an entire film. At a standard frame rate of 24 frames per second, 24 individual photographs are required to create just one second of animation. Therefore, a single minute of animation requires 1,440 individual frames/photographs/drawings.

In stop-motion animation, each frame represents a small physical adjustment made to a character or object before the next photograph is taken. This process makes stop-motion inherently tactile. The animator physically interacts with the character, environment, light, camera, and materials. The imperfections that emerge from this process can become part of the visual language of the film. Movement, texture, scale, lighting, and materiality are therefore not simply technical considerations; they contribute directly to the storytelling. It was this material quality of stop-motion that made it particularly appropriate for the objectives of Save Our Species.

From Classroom to Film Studio

Save Our Species was an experiment to explore stop-motion animation as a creative and pedagogical practice. However, unlike a conventional animation production, the film was not created in a dedicated animation studio equipped with professional facilities such as specialised lighting systems, animation rigs, prop storage, shooting tables, and controlled production environments. Instead, the film was created in a regular classroom, C-LH8 in the Mechanical Engineering Building at IIT Hyderabad. The transformation of an ordinary classroom into a temporary animation studio was an important part of the experiment. Tables, chairs, walls, available surfaces, lighting equipment, and discarded materials were incorporated into the production process. Figure 2 demonstrates the classroom, which would normally serve as a space for lectures and discussions, became a space for experimentation, construction, photography, direction, and animation.



Figure 2. Students working on the film, Save Our Species.

The project was developed as part of a design pedagogy experiment for first-year BDes students. Most of the students had never animated before. Rather than introducing animation solely as a software-based discipline, the project provided them with an opportunity to understand animation through physical experimentation. This approach was also intended to challenge some of the assumptions surrounding filmmaking. Film production is often perceived as an expensive and resource-intensive activity involving elaborate sets, specialised equipment, large crews, and substantial budgets. While these resources can certainly support ambitious productions, the absence of such resources does not necessarily prevent creative filmmaking. In the case of Save Our Species, the budget was extremely limited. It would, however, be inaccurate to describe the film as having absolutely no budget. A DSLR camera, basic lighting equipment, and subscription-based editing software were used during production. Nevertheless, the expenditure was negligible when compared with conventional film production. This limitation led to an important question that became central to the experiment: Can innovation emerge from constraints rather than despite them?

Learning Animation Through Practice

The students were initially introduced to the fundamental principles of animation through a classroom lecture and discussions. These sessions were intended to establish an understanding that animation is fundamentally an art of movement and expression, rather than simply the process of moving drawings, objects, puppets, or digital models from one position to another. Understanding principles such as timing, spacing, anticipation, exaggeration, squash and stretch, and staging is essential to creating convincing animated movement. However, these principles can often remain abstract when taught only through lectures or software demonstrations. The students therefore needed an opportunity to experience them physically. A fundamental philosophy within design education is "learning by doing." Design students develop an understanding of materials, processes, and problem-solving not only through theoretical instruction but also through experimentation and making. This stop-motion project provided an opportunity to apply this philosophy directly. The structure of the design curriculum also supported this approach. Design courses are often organised in a modular manner, allowing students to become deeply immersed in a particular subject for a concentrated period. This made it possible to introduce the fundamentals of animation and then immediately apply them to a collaborative film project. As a design practitioner and educator, the project also provided me with the opportunity to direct and animate a film alongside the students. Rather than positioning the educator only as a lecturer, the production became a shared process of experimentation in which teaching, directing, designing, making, and problem-solving occurred simultaneously.

Designing Characters from Nature



Figure 3. Elephant created from various stones.

The conceptual development of the film began with endangered species. The students were introduced to a selection of endangered animals and asked to work in pairs. Each pair selected a species and developed a visual representation of that animal using materials found in nature. This restriction was deliberate. Instead of asking students to construct conventional puppets from clay, plastic, foam, or other commonly used animation materials, they were encouraged to look at their surroundings and consider how naturally occurring materials could communicate the physical characteristics of an animal. Stones, gravel, leaves, wood, soil, seeds and other natural elements became components of the characters and environments. The students therefore had to think beyond conventional character-design principles and consider the shape, texture, weight, colour, and surface quality of the materials available to them. For example, Figure 3 shows an elephant constructed using different forms of stones assembled against a discarded wooden backdrop. The stones provided a natural sense of weight and texture, while their individual shapes became part of the character design. Rather than attempting to conceal the material, the design embraced it.

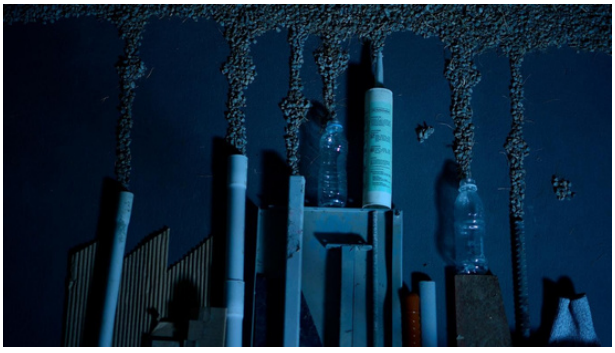


Figure 4. Factories made from discarded material. Smoke created from gravel.

Similarly, Figure 4 depicts a factory environment constructed using discarded materials found around the classroom. Gravel was used to create the visual appearance of smoke. These choices transformed ordinary waste materials into elements of the visual narrative. Other endangered species including a sea turtle, rhinoceros, leopard, pangolin, and albatrosses were similarly constructed using natural materials. The material choices therefore served two purposes. First, they solved a practical production problem by providing inexpensive and readily available resources.

Second, they reinforced the central theme of the film. The animals were literally constructed from nature, while the threats to them were represented through discarded human-made and industrial materials.

Sustainability as Part of the Filmmaking Process

The primary objective of the experiment was to challenge the assumption that filmmaking and animation require large budgets and sophisticated production facilities. However, an equally important objective was to examine sustainability within the filmmaking process itself. Sustainability is frequently discussed in relation to product design, architecture, industrial design, and engineering. Designers are increasingly encouraged to consider material sourcing, manufacturing processes, lifecycle, reuse, and disposal. However, creative industries such as film and animation can also have a significant material footprint. Film productions may involve the construction of temporary sets, props, costumes, models, packaging, backdrops, and other physical elements. Once a production is completed, many of these materials may have little practical use and can become waste. Even when the final product communicates an environmental message, the production process itself may not necessarily reflect the same values. *Save Our Species* attempted to address this contradiction. The intention was not to claim that the production process was completely sustainable, but rather to make students aware of the relationship between creative production and material consumption. By repurposing discarded materials and using natural materials to create the film, sustainability became a practical design consideration rather than merely a subject discussed within the narrative.

The process also encouraged students to reconsider the value of materials. A discarded piece of wood could become a background. Gravel could become smoke. Stones could become an elephant, leaves an albatross, a coconut shell into a sea turtle and more. Materials that might otherwise be ignored or discarded could acquire a new visual and narrative function. In this sense, the project explored the idea that material constraints can become creative opportunities for innovation.

Impact on Student Learning

The educational outcome of the project extended beyond learning the technical process of stop-motion animation. Students were required to collaborate, conceptualise characters, develop storyboards, construct sets, experiment with materials, understand movement, operate a camera, and solve problems during production. The limitations of the classroom environment also encouraged improvisation. Unlike a professional studio where specific equipment may be readily available, the students had to work with what they had. This encouraged a problem-solving mindset that is particularly relevant to design education. A survey conducted later with the students who participated in the course indicated that the exercise increased their awareness of material consumption in their design projects.

The experience encouraged students to think more carefully about the materials they selected, how much material they consumed, and whether existing or discarded materials could be repurposed. This outcome was particularly significant because the lesson extended beyond animation. The students were introduced to an approach to design that could potentially be applied to other creative disciplines.

Recognition and Subsequent Films

Save Our Species eventually received 31 official selections at international film festivals and eight international awards. While this recognition was encouraging, the most significant outcome of the project was its influence on subsequent creative experiments. The approach developed during the making of Save Our Species became the foundation for several later films, including *Mitti*, *Something More*, and *Dharti*. These films continued to explore the possibilities of repurposing materials and using material experimentation as an integral part of the filmmaking process. The success of the project demonstrated that an educational exercise conducted in an ordinary classroom could evolve into a meaningful creative production with international recognition.

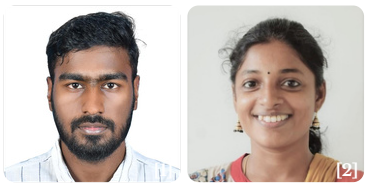
Conclusion

Save Our Species was more than an experiment in stop-motion animation. It was an exploration of the relationship between animation, design education, sustainability, material experimentation, and resource constraints. The project demonstrated that a conventional classroom could be transformed into a functional animation studio, that discarded materials could become meaningful components of a film, and that natural materials could be used to represent endangered species in a visually distinctive manner. The project challenged the perception that creative production requires abundant resources. The limitations of budget, space, equipment, and materials became opportunities for students to experiment and develop alternative solutions. The film also highlighted an important contradiction within environmental storytelling: a film may advocate for the protection of nature while its own production processes contribute to material waste. By consciously incorporating sustainability into the making of the film, *Save Our Species* attempted to align its production methodology with its environmental message. The experiment therefore suggests that sustainability in animation does not necessarily begin with expensive technology or specialised infrastructure. It can begin with a simple shift in attitude, looking at available materials differently, questioning consumption, repurposing what already exists, and allowing constraints to stimulate creativity. Save Our Species became an experiment not only in making animation, but also in rethinking how animation can be made.

I would like to acknowledge the BDes batch of 2019–23 for their creativity, collaboration, and valuable contribution to the making of this film.

[1] Dr Delwyn Jude Remedios
Associate Professor, Department of Design
IIC Convenor, IITH

Sensing the Unseen: An Indigenous Sensor for Aqueous PFOA Measurement



KID: 20260211

Introduction

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made organo-fluorine chemicals that have been termed "forever chemicals" due to their exceptional chemical stability. Among the reported PFAS compounds, perfluorooctanoic acid (PFOA) is notable for its global presence due to widespread applications and high environmental persistence. PFOA, with a half-life of 40 years, bioaccumulates in living organisms and poses significant health risks, including immunotoxicity and carcinogenicity. In addition, PFOA often serves as a stable degradation product of various precursor perfluorinated compounds. Consequently, developing analytical methods for the determination of PFOA in water bodies is essential toward protecting water resources and public health.

The most common analytical methods used to determine PFOA compounds include chromatographic techniques coupled with mass spectrometry. Although chromatography methods provide accurate and sensitive measurements, they often require expensive instrumentation, making them unsuitable for in situ or real-time monitoring applications. Moreover, traditional chromatography techniques are limited by their complex sample preparation and lack of field portability. Thus, to overcome the limitations of chromatography techniques, several other methods have been developed for PFOA detection. Among the reported techniques, the most notable is fluorescent detection. The techniques involve interaction between target PFOA compound and fluorescence sensor, and subsequent measurement of corresponding fluorescence intensity.

Turning Molecular Interactions into Information (Patent no: 571206)

Our research group has developed a Cu-based fluorescence sensor for the detection of PFOA in aqueous solution. The principle of fluorescence detection of PFOA involves the measurement of fluorescence emission of compounds in response to light excitation. It should be noted that in the presence of PFOA, the fluorescence emission intensity may increase or decrease, as shown in Figure 1. Thus, a linear relationship between change in fluorescence intensity and varying concentrations of PFOA is recorded to establish a standard detection method for PFOA in the aqueous environment.

The sensor exhibited a measurable fluorescence response upon interaction with PFOA, enabling detection over a defined concentration range of 1.2 to 24 µM. Thereby establishing a strong emphasis for further optimization, sensitivity enhancement, and real-sample validation.

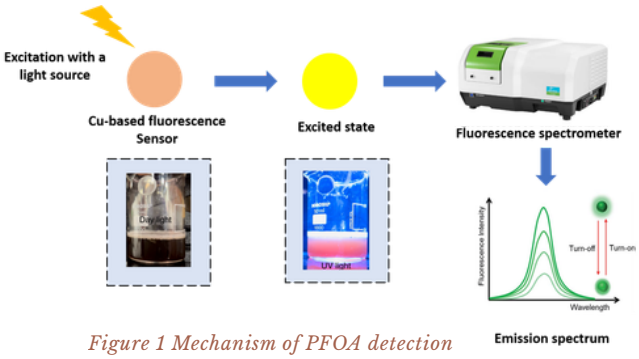


Figure 1 Mechanism of PFOA detection

The outcome of the study includes:

- Widespread Real-Time Surveillance: Facilitating continuous, on-site PFOA monitoring in diverse water bodies, overcoming the current bottleneck of centralized lab analysis. This empowers immediate decision-making for public health and environmental protection.
- Enhanced Regulatory Compliance: Providing accessible tools for regulatory bodies to enforce PFOA limits more effectively and broadly, supporting tighter control over this persistent pollutant.
- Economic Accessibility: Significantly reducing the financial and logistical barriers associated with PFOA testing, making advanced monitoring capabilities accessible to a wider range of stakeholders, including municipalities and industries.
- Improved Public Health Outcomes: Enabling rapid identification of contamination sources, allowing for quicker intervention to protect communities from PFOA exposure.

Potential Applications

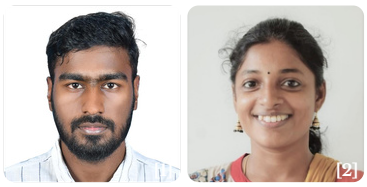
The developed Cu-based fluorescence sensor for PFOA detection has significant potential for real-world environmental and industrial applications. Its low cost, rapid response, and minimal instrumentation requirements make it highly suitable for on-site monitoring of PFAS contamination in surface water, groundwater, and drinking water sources. The sensor can be integrated into portable fluorescence devices for real-time surveillance at industrial discharge points, landfills, wastewater treatment plants, and contaminated sites, enabling early detection and risk mitigation.

From an industrial perspective, this sensing platform can be employed for routine compliance monitoring in sectors such as fluoropolymer manufacturing, textile finishing, firefighting foam production, and electroplating industries, where PFAS usage and discharge are prevalent.

[1] Mr Venkateshwaran Gopal
Research Scholar, Department of Civil Engineering
[2] Dr. Ambika S
Assistant Professor, Department of Civil Engineering

The Wonder of Hybrid Membranes: Engineering Membranes with Multifunctionality for Cleaner Water

KID: 20260212



What Makes a Membrane "Hybrid"?

A conventional membrane primarily acts as a physical barrier and separates pollutants based on its pore size, hydrophobicity, and structure. In contrast, a hybrid membrane incorporates functional materials that endow it with catalytic activity, enhanced adsorptive sites, and electrical conductivity. The resulting membrane becomes a reactive interface that can simultaneously perform filtration, adsorption, and pollutant degradation in a single unit. In our laboratory, various functional materials, including graphene-based materials, conductive polymers, metal-oxide-based photocatalysts, and polymer or ceramic supports, were combined to develop multifunctional membranes for water treatment applications.

A Family of Multifunctional Hybrid Membranes that We Work On

1. Photocatalytic Membrane

A photocatalytic membrane integrates a semiconductor photocatalyst with membrane supports. Upon light irradiation, the photocatalyst is excited to form an electron-hole pair and produces reactive radicals. These radicals possess high oxidizing capacity and can degrade a wide range of organic pollutants. Such membranes have been investigated for the simultaneous filtration and degradation of dyes, antibiotics, pesticides and other emerging contaminants.

2. Electrocatalytic Membrane

In an electrocatalytic membrane, electrically conductive or electrochemically active materials were incorporated into the membrane structure. Thus, by applying an external potential, the membrane surface becomes an active electrode capable of carrying out electrochemical oxidation/reduction reactions. In addition to enhancing pollutant removal, electrocatalytic membranes have gained significant attention due to their ability to mitigate membrane fouling and improve antifouling performance.

3. Electro-Fenton Membrane

Herein, the membrane surface is engineered to electrochemically generate hydrogen peroxide (H2O2) in situ from dissolved oxygen. The generated H2O2 subsequently reacts with iron species to produce highly reactive hydroxyl radicals through the Fenton reaction. These radicals facilitate the oxidative degradation of organic pollutants, enabling simultaneous filtration and advanced oxidation within a single membrane system.

4. Photo-electrocatalytic Membrane

The photo-electrocatalytic membrane (PECM) represents one of the most promising and innovative membrane-based technologies explored in our laboratory. As the name indicates, PECM combines filtration, photocatalysis, and electrocatalysis in a single unit.

Herein, the photocatalyst is activated by light, while an external electrical bias facilitates the separation and transport of photogenerated charge carriers. This can suppress electron-hole pair recombination and improve the generation of reactive species.

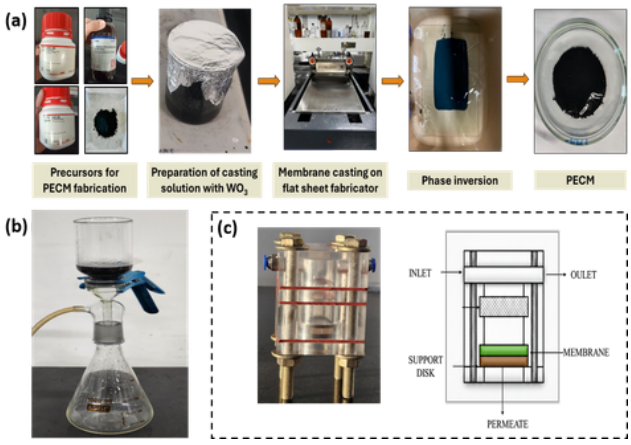


Figure 1 (a) Preparation of polymeric PECM, (b) dead-end filtration assembly, and (c) cross-flow filtration assembly

The choice of membrane support is another important aspect of our research. Membranes are usually of polymeric or ceramic background. Polymeric membranes usually offer flexibility, processability and relatively easy fabrication. Functional materials can be incorporated into the polymer matrix to produce mixed-matrix membranes, as shown in Figure 1(a). In contrast, ceramic membranes provide high chemical and thermal stability. Their robust structure makes them attractive for harsh wastewater treatment conditions. Functional materials can be deposited onto the ceramic surface to form catalytic or electrochemically active interfaces. However, the high cost of ceramic precursors limits their application.

Waste Aluminum-foil Derived PECM for Treatment of Persistent Organic Pollutants (Patent no: 584065)

One of the distinctive innovations from our laboratory is the development of a waste aluminum foil-derived PECM for the treatment of persistent organic pollutants. In this approach, discarded aluminum foil is converted into Al2O3, thus providing a robust ceramic membrane support while simultaneously addressing the high cost associated with conventional ceramic membrane fabrication. Such an approach promotes the "waste-to-wealth" paradigm while fostering the circular economy. The Al2O3 membrane is subsequently integrated with reduced graphene oxide (rGO), metal-oxide nanoparticle and conductive polymer to create a multicomponent heterojunction with enhanced photoelectrocatalytic activity.

Moreover, the developed Al2O3-based PECM exhibited strong self-cleaning and antifouling behaviour, retaining approximately 81% fouling recovery after five consecutive cycles, while maintaining more than 80% ciprofloxacin removal over five reuse cycles. This study offers a twofold contribution by integrating resource circularity (post-consumer aluminum foil waste transformed into high-value ceramic substrates, thereby advancing circular economy principles) and functional innovation (hybrid PECM process with synergistic photocatalytic and electrochemical activity).

Under simultaneous light irradiation and electrical bias, the developed Al2O3-based PECM demonstrated 92.4% removal of ciprofloxacin (a representative pollutant), with a reaction rate 1.5 and 1.9 times higher than the corresponding photocatalytic and electrocatalytic membrane processes, respectively. The system also achieved 53.64% total organic carbon removal, indicating substantial mineralization.

Currently, we are working on scaling up from laboratory-scale membranes to practical module configurations. This transition has progressed through systematic evaluation under laboratory-scale dead-end and cross-flow filtration assembly (Figure 1(b and c)), enabling assessment and validation of membrane performance under different operating conditions. Moreover, long-term studies on membrane stability, catalyst durability, regeneration, and potential material leaching are being conducted to establish operational reliability and environmental safety.

Reference:

- Ambika, S., Gopal, V., Joji, J., Srivastava, I., Deshmukh, S., Vedantam, S., (2026). A multifunctional membrane and the method of preparation thereof - Patent No: 584065

Summary

Hybrid membranes represent a significant shift from conventional physical separation toward integrated separation and reaction. By incorporating catalytic and electrochemical functionalities into membrane structures, our laboratory has developed photocatalytic, electrocatalytic, electro-Fenton, and photoelectrocatalytic membranes based on both polymeric and ceramic platforms. These systems address the conventional trade-off between filtration and pollutant removal by enabling simultaneous filtration and degradation. This integrated approach can also mitigate membrane fouling, thereby enhance membrane performance and potentially improve operational stability. The development of hybrid membranes brings together several areas of science and engineering such as membrane technology, nanomaterials, catalysis, electrochemistry, materials science and environmental engineering.

[1] Mr Venkateshwaran Gopal
Research Scholar, Department of Civil Engineering
[2] Dr Ambika S
Assistant Professor, Department of Civil Engineering

Trash to Treasure: An Innovative, Sustainable Transformation of Plastic Waste into CO_2-Capturing Materials

KID: 20260213



Plastic Waste Valorization for the CO_2-Capturing Technology

Polyethylene terephthalate (PET) is among the most extensively manufactured polymers worldwide, with an annual production of ~70 million metric tons and accounting for nearly 18% of global plastic output.1–4 Nevertheless, PET recovery is limited by inadequate collection infrastructure, the complexity of post-consumer sorting, and the unfavorable cost comparison between recycled and virgin PET. Consequently, most discarded PET (approximately 85–90%) is either landfilled or incinerated, thereby increasing its environmental footprint.5–7 Thus, only about 10–15% of PET waste is recycled mainly through mechanical methods, highlighting the need for more efficient and economically viable recycling technologies to manage the increasing quantities of plastic waste.

Chemical upcycling offers an attractive alternative by converting PET waste into high-value functional materials while addressing both plastic pollution and carbon-management challenges. The transformation of PET into carbon dioxide (CO_2) sorbents, in particular, could help meet projected CO_2 removal requirements, which may reach 1.5–2.6 billion metric tons annually by 2050 to achieve carbon neutrality. Meeting this scale of deployment will require sorbents that can be manufactured at million-ton production rates using inexpensive, readily available feedstocks. Earlier studies have investigated PET conversion through energy-intensive pyrolysis to produce activated carbon, as well as the preparation of organic ligands from PET-derived intermediates for subsequent metal–organic framework (MOF) synthesis.

Building on our prior demonstration of nanosheet morphology of α-Al2O3 catalyzing aminolysis depolymerization of polyesters, we propose aminolysis as a scalable, operationally simple, and cost-effective route to the production of CO_2 sorbents from PET waste.1 Here, we developed sustainable catalytic strategies for the atom-economic aminolysis of post-consumer PET waste, providing a cost-effective solution for plastic waste recycling. α-Al2O3 stands out as a practical choice because of its low cost and wide availability, along with its tunable, mild acid-base properties. The optimized α-Al2O3 catalyst exhibited excellent activity in PET aminolysis with ethylenediamine (EDA), affording 92% isolated yield of bis(2-aminoethyl) terephthalamide (BAET) as solid-state CO_2-capture materials.

Sustainable Catalysis Research at SP HeteroCat Lab, IIT Hyderabad

Dr. Sudarsanam's research group (SP HeteroCat Lab) at IIT Hyderabad is dedicated to developing practical catalytic technologies to valorize plastic waste into value-added monomers, fuels, and chemicals. One of the central focuses of the SP HeteroCat Lab is the production of monomers from PET plastic waste for CO_2-capturing technology (Fig. 1). To achieve efficient PET depolymerization, a heterogeneous catalyst with an optimal density of acid sites is essential.

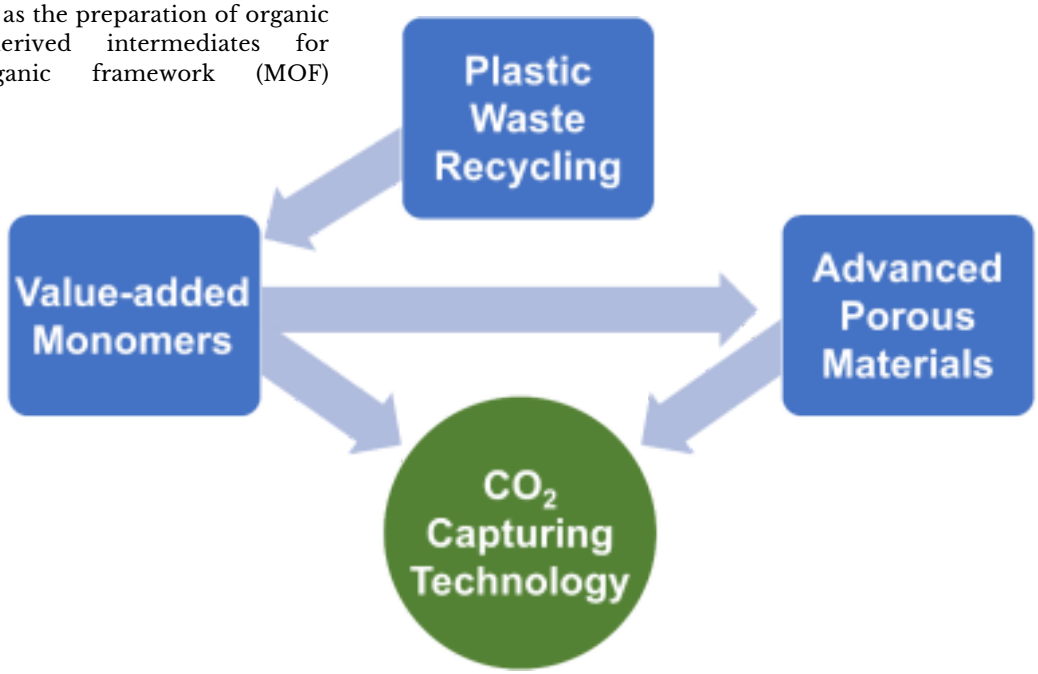


Figure 1. Overview of Dr. Sudarsanam's group research on the PET plastic waste recycling into value-added monomers and their conversion into advanced porous materials for efficient CO_2- capturing technologies.

In this direction, Mr. Arun Kumar Mudavath, a PhD student in Dr. Sudarsanam's group, has developed a novel catalytic strategy for PET aminolysis using EDA as the amine source to produce BAET over a cost-effective 2D α-Al2O3 nanosheet catalyst. The catalyst possesses a porous, accessible surface that exposes a high concentration of catalytically active sites with tailored acidity. This combination of nanoscale architecture and controlled acid-site distribution promotes the depolymerization of PET under mild, near-ambient conditions. The synthesized BAET monomer has enormous potential for CO_2 capture, offering an economical and sustainable way to reduce atmospheric CO_2 levels.

Challenges and Prospects

Although our group has established an economically attractive and environmentally benign catalytic process for converting PET into value-added monomers via aminolysis, its practical industrial implementation will require further advances in process scale-up, catalyst recovery, and product separation. In this direction, Dr. Sudarsanam Putla and Mr. Arun Kumar Mudavath are investigating reaction enlargement and catalyst reusability using a range of post-consumer plastic feedstocks.

Concurrently, we are exploring the conversion of plastic-derived monomers into covalent organic frameworks (COFs) and metal–organic frameworks (MOFs) for CO_2 capture, with particular emphasis on preserving their adsorption performance under mild operating conditions. Together, these efforts aim to develop an integrated, sustainable platform for producing useful monomers and porous functional materials from plastic waste, while supporting greenhouse gas mitigation and broader environmental applications.

[1] Mr Mudavath Arun Kumar
Research Scholar, Department of Chemistry
[2] Dr Putla Sudarsanam
Assistant Professor, Department of Chemistry

Treatment Using Hybrid Algal-Bacterial Bioreactors: A New Dimension in Wastewater Engineering



KID: 20260214

India treats barely a third of the urban wastewater it generates every day; the rest flows into waterbodies, largely untreated. Conventional biological treatment processes are energy-intensive primarily because of the mechanical aeration required to sustain aerobic microorganisms. This article describes an engineered hybrid algal-bacterial system we developed in our laboratory at IIT Hyderabad as an alternative to conventional systems to address this issue. It exploits a symbiotic partnership that exists between microalgae and heterotrophic microorganisms in natural systems and promotes the same in the new system to reduce the energy use while also removing organic carbon, nutrients, and a class of compounds called 'emerging pollutants' or micropollutants, which are mostly anthropogenic. One version of this technology has already been commercialized and is in operation at an industrial site. I walk through the genesis of the idea, the development phase the technology is in today, and the real-world issues that we faced in moving it from the laboratory to the market – hurdles that, I believe, offer useful lessons for everyone at the institute trying to commercialize their own research.

Wastewater Treatment in India: The Underlying Problem

Wastewater treatment & reuse remains a major infrastructural gap in India. The existing infrastructure can hardly treat about one-third of the urban wastewater it generates every day; the rest flows into receiving water bodies, largely untreated, thereby putting public health at risk. The discharge guidelines have become much stricter in recent years, and the government emphasizes removing both organic carbon (measured as BOD and COD, which indicate the oxygen demand exerted by pollutants) and nutrients (such as nitrogen and phosphorus) from wastewater so that the treated water can be safely reused for non-potable purposes.

It is difficult to achieve high carbon and nitrogen removal simultaneously using conventional technologies without incurring much expenditure. They require multiple bioreactors working one after another – one for carbon removal (aerobic, and also needed for extended aeration) and another for nutrients (anaerobic or anoxic). The mainstay of conventional treatment, the Activated Sludge Process (ASP), depends on heterotrophic microorganisms that need a continuous supply of air to function. This aeration step, driven by blowers, accounts for 45 to 75 percent of a treatment plant's total power bill. That leaves a clear engineering opportunity – a technology that can achieve carbon oxidation and nutrient removal in fewer steps, at a lower cost, preferably in a single tank, without sacrificing treatment efficiency.

The Proposed Technology and the Science Behind It

Our R&D on the algal-bacterial treatment process is based on the symbiotic association that exists between heterotrophic microorganisms (mainly bacteria) and predominantly photoautotrophic microalgae in nature (Figure 1). The central idea is straightforward - Microalgae, in the presence of light and carbon dioxide, perform photosynthesis releasing oxygen as a by-product. Heterotrophic bacteria then use this oxygen to break down and mineralize organic matter in the wastewater, releasing carbon dioxide, nutrients (nitrogen and phosphorus), and other minerals that the microalgae take up in turn for maintaining their growth. This back-and-forth exchange sharply reduces the mechanical aeration — and therefore the energy — that treatment would otherwise require.

The algal-bacterial symbiosis has many advantages and goes well beyond energy saving. Reactive oxygen species produced during algal photosynthesis chemically break down micropollutants, the trace organic contaminants that are primarily anthropogenic, which conventional processes tend to handle poorly, as they are not designed to do so in the first place. Another notable advantage of this association is that aqueous-phase nitrogen is assimilated into algal-bacterial biomass rather than being converted to nitrogen gas and lost to the atmosphere, as in conventional nitrification-denitrification process; it remains within the biosphere and can be recovered as a resource. That makes the resulting sludge more valuable too: instead of being disposed of as pure waste, it can be turned into fertilizer, animal feed, or biofuel feedstock. Also, as such hybrid systems produce fewer biological and biochemical emissions, they also leave a smaller carbon footprint than conventional alternatives.

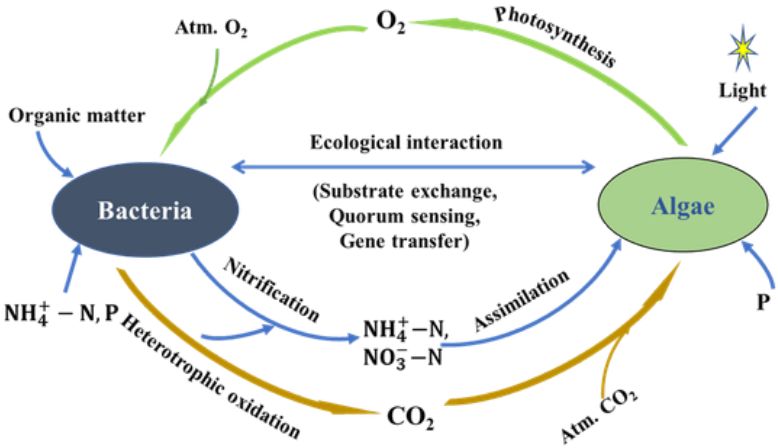


Figure 1. Algal-bacterial symbiosis: microalgae supply oxygen through photosynthesis for use by heterotrophic bacteria, while the bacteria supply carbon dioxide and nutrients that support algal growth.

What Is New in This Approach

Algal treatment is not new in itself; algal ponds have long been used as a tertiary (final polishing) step in wastewater treatment, but they require large areas of land, which limits their practicality. Our work instead positions the algal-bacterial process as a secondary (that is, principal biological) treatment step, using hyper-concentrated algal-bacterial cultures that occupy a much smaller footprint while still achieving substantial removal of carbon, nitrogen and phosphorus within short retention times. The objective is to replace, or supplement, the conventional biological treatment unit itself, achieving simultaneous removal of organic carbon, nutrients, and micropollutants in a single tank at a lower energy cost and a smaller carbon footprint, while producing a biomass by-product that can be potentially reused as fertilizer.



Figure 2. Pilot-scale Algal-Bacterial Attached Growth System, illuminated with blue LEDs to promote diatom-dominated biofilm growth on the textile support medium.

Present Status of the Technology

We have developed two prototypes. The first is an algal-bacterial attached-growth system, in which wastewater is sprayed over a vertically hung, textile-like support medium suspended in a caged framework; algal-bacterial biofilm develops on this medium as water trickles down its surface, and LED lighting (we used blue LEDs, which favour diatom growth, although white light or sunlight works equally well for green microalgae) promotes photosynthesis. This unit is designed to sit upstream in the biological treatment train, substantially reducing the organic-load — and hence the downstream aeration requirement — before the wastewater reaches the main treatment process (Figure 2).

The second is an anaerobic-aerobic algal-bacterial suspended-growth system, in which a conventional activated sludge reactor is modified by introducing LED lighting into one chamber, allowing algae and bacteria to develop as a suspended culture rather than as an attached biofilm. Minimal external aeration is maintained, principally to keep the biomass in suspension, while the bulk of the oxygen demand is met photosynthetically (Figure 3).



Figure 3. Pilot-scale anaerobic-aerobic algal-bacterial suspended-growth reactor, showing the LED-illuminated chamber where algal photosynthesis supplies the bulk of the oxygen otherwise provided by mechanical aeration.

Technology Readiness Level and Commercialization

Both prototypes have progressed well beyond the laboratory stage. The Algal-Bacterial Attached Growth System has been commercialized and has reached Technology Readiness Level 9 (TRL 9 denotes a technology validated through full-scale, real-world operation). It is currently installed as an intermediate treatment unit in the condenser processing effluent treatment and reuse plant of a sugar-distillery industry (Figure 4).

Although the prototypes were originally conceived with gated residential communities in mind, industry became our first client, since industrial effluent — provided it does not contain chemicals detrimental to algal growth — suits the process well. The Anaerobic-Aerobic Algal-Bacterial Suspended-Growth System has completed pilot-scale development trials (TRL 6–7), and we are actively engaging with industries interested in taking it to field scale.



Figure 4. Field-scale installation of the Algal-Bacterial Attached Growth System, commissioned at a sugar-distillery effluent treatment plant.

Way Forward: Technological and Commercialization Challenges

Every technology carries both strengths and limitations, and ours is no exception. Meeting statutory discharge or reuse standards for BOD and COD has not proved difficult. Consistently meeting nitrogen removal limits through the assimilative (algal uptake) pathway, however, remains challenging, largely because the carbon-to-nutrient ratio of the incoming wastewater is often unfavourable for algal growth. At laboratory scale, we have validated the ideal carbon-to-nutrient ratio reported in the literature, and we are now examining whether blending different wastewater streams — a strategy commonly used in the biological transformation of solid organic waste to supply a favourable co-substrate — can correct this imbalance under field conditions. We are also investigating the engineering control of quorum-sensing molecules, the chemical signals that regulate algal-bacterial interactions, with a view to sustaining high algal populations, and hence high nutrient removal, throughout plant operation.

The commercialization process itself surfaced a different, and in some ways more instructive, set of challenges. Any new technology finds few early adopters, because of the financial risk involved: installing an effluent treatment plant is an investment running into several crores of rupees, and industries — for whom treatment is often a regulatory compulsion rather than a discretionary choice — understandably favour conventional, proven technologies over unproven alternatives. This caution is one reason why, despite successfully commissioning an effluent treatment plant during the COVID-19 period, we had to wait three years before securing a second field opportunity.

A second, less obvious obstacle arises after commissioning. Many industries outsource the operation and maintenance of their treatment plants to third-party contractors once the initial annual maintenance contract ends. These contractors are trained to operate conventional systems, and their unfamiliarity with a new technology and its underlying concepts acts as a further impediment to adoption, independent of the technology's technical merit. These are practical realities that we, as academic researchers, sometimes fail to anticipate. An aggressive and sustained marketing and training strategy is, therefore, as essential to commercialization as the underlying science — a lesson that may prove particularly relevant to small and medium enterprises and startups that partner with IITs and other academic institutions for product and process development under schemes such as UAY and IMPRINT.

My own conclusion, after this experience, is that technical validation is necessary but not sufficient: sustained engagement with the client, and with those who will ultimately operate the technology, is equally indispensable if a research innovation is to succeed once it leaves the laboratory and enters the market.

[1] Prof Debraj Bhattacharyya
Department of Civil Engineering
Department of Climate Change,
Greenko School of Sustainability

Turning Battery Waste into Resources: Innovative Membrane Technologies for Critical Mineral Recovery

KID: 20260215


[1]


[2]

Introduction

The rapid expansion of the energy storage and electric vehicle markets has led to a significant rise in the generation of spent LIBs. But what happens when these batteries reach the end of their useful life? What appears to be waste may contain significant concentrations of critical minerals, including lithium (Li), cobalt (Co), nickel (Ni), and manganese (Mn).

Recovering these metals, however, is far more complicated than simply recycling a battery. During the recycling process, these valuable metals are transferred into complex aqueous solutions containing multiple ions and high concentrations of inorganic compounds. The challenge is not merely to recover metals but to do so selectively, efficiently, and sustainably.

At IIT Hyderabad, research is being directed towards these challenges through the development of advanced green solvent- and membrane-based technologies that aim to transform battery-recycling wastewater from a treatment problem into a source of valuable resources.

From waste to resource

Conventional hydrometallurgical recycling techniques, such as precipitation, solvent extraction, and ion-exchange, have notable limitations, including low selectivity, secondary waste generation, and high energy and solvent consumption. More importantly, selectively separating these metal ions from a complex mixture remains a major challenge. Their chemical behaviour can overlap, and the presence of competing ions can interfere with separation. Developing a selective recovery process, therefore, requires more than simply finding a reagent that reacts with a metal.

To address this question, our research focuses on two areas of innovation: designer solvents and selective membranes. Rather than treating all metals in the leachate the same way, the objective is to design a system that uses distinct chemical interactions to transport and recover specific metals selectively.

One of the key components of our research is the development of target-specific green solvents, particularly deep eutectic solvents (DESs) designed for the extraction of critical minerals.

> *This creates an important research question:*
>
> *Can the chemistry of the separation process itself be designed to capture individual critical metals selectively?*

DESs are formed by combining suitable components of hydrogen-bond donors (HBDs) and hydrogen-bond acceptors (HBAs) to produce a liquid system with properties that differ from those of the individual components (Figure 1). Their composition can be tailored to provide specific chemical functionalities, making them attractive for selective extraction and separation. The importance of this approach lies in its tunability.

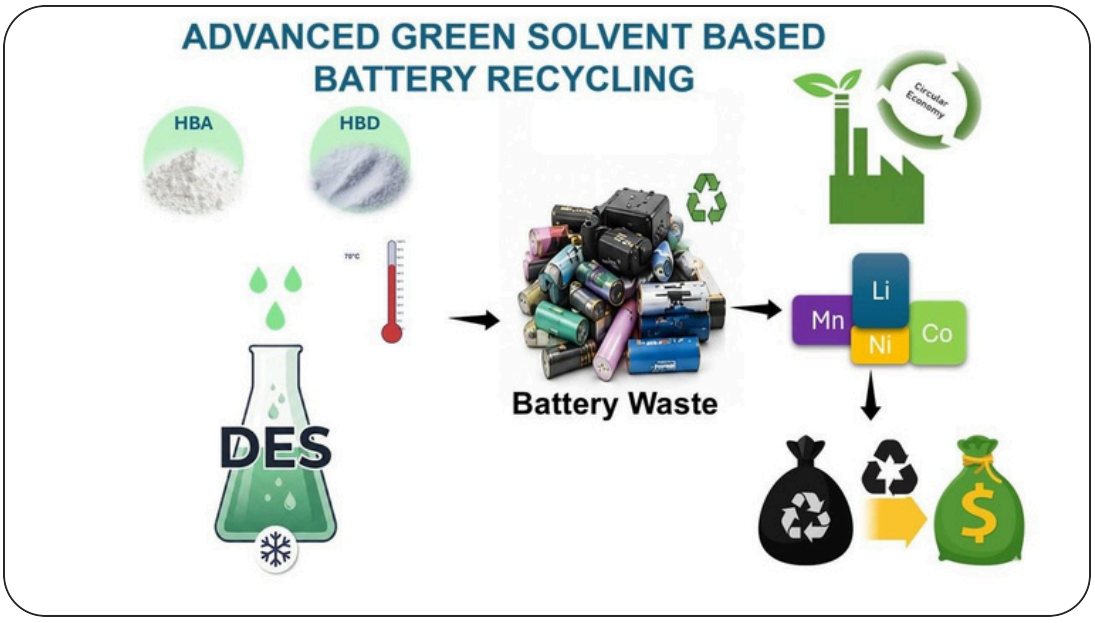


Figure 1. Metal extraction from LIBs

Instead of relying on a conventional solvent whose properties are largely fixed, a DES can be viewed as a designer separation medium whose composition and functionality can be modified according to the target metal and application. We have been working on the synthesis of DESs systems for the selective extraction of critical minerals, including lithium, cobalt, nickel, and manganese, from aqueous solutions.

Next phase of work:

The next step of our research is to move beyond conventional liquid-liquid extraction. In a conventional solvent extraction process, the aqueous metal solution must be contacted with an immiscible organic phase. After extraction, another operation is generally required to recover the metal from the organic phase. A new approach, which includes liquid membranes (LMs), is a platform in which a polymer matrix contains a carrier or extractant that transports the target metal across the membrane as shown in Figure 2. Unlike a conventional membrane that primarily separates species based on size or physical properties, a LMs can perform a much more sophisticated task. It can use chemical interactions to selectively transport a target metal, thereby avoiding the need to mix large volumes of an organic solvent with the aqueous phase. We are exploring various selective green solvents that can be tuned to enable the development of membranes with distinct metal-selective transport characteristics. The transition from green solvents to LMs represents an important evolution in the research. At the green solvent level, the focus is on understanding and designing chemical interactions. whereas at the LMs level, those interactions are incorporated into a functional material that can physically separate species. By designing solvents that recognize valuable metals and membranes that selectively transport them, this research is taking steps towards making recovery more efficient—and turning battery-recycling wastewater from a disposal challenge into a potential source of critical resources.

"The future of battery recycling may depend not only on how efficiently we recover materials but also on how intelligently we separate and reuse them."

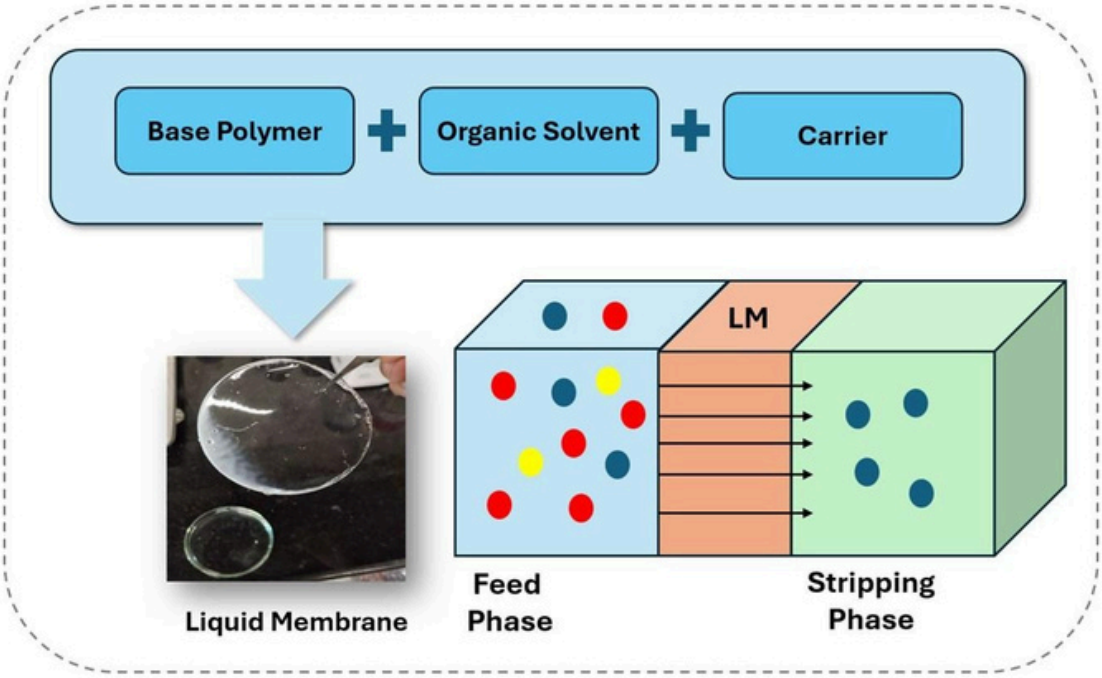


Figure 2. Liquid Membranes (LMs)

[1] Mr Vikas Hitendrasinh Rathod
Research Scholar
Department of Civil Engineering
[2] Dr Ambika S
Assistant Professor
Department of Civil Engineering

The reason India fails to build deep-tech titans despite having a huge talent pool lies in how we train our engineers. Four simultaneous reforms can put us on the map

MAKING ENGINEERS WHO CAN ENGINEER NATION'S SUCCESS

HARISH N DIXIT
Professor, Centre for Interdisciplinary Programs, IIT Hyderabad

ANURAG TRIPATHI
Associate Professor, Department of Physics, IIT Hyderabad



EVERY year, India mints roughly 15 lakh fresh engineering graduates. Add to this the fact that one in every six humans on the planet is Indian. By a reasonable arithmetic of talent, we may aspire to have roughly one in six of the world's most valuable deep-tech companies founded on Indian soil. Why is that not the case?

As artificial intelligence absorbs more routine cognitive work, the engineers whose value endures will be those who build. Now imagine a pavilion under which a nation of builders can invent, design and make. Such a structure can be raised by four pillars—standing for four reforms—bearing equal load. Erect three to perfection and leave the fourth unraised, and the roof never goes up. Raise even one weakly, and the whole structure tilts. Each of these four reforms addresses a different stage in the making of an engineer.

Signal that builders matter: Entrance exams to India's elite engineering institutions—most prominently, the IITs' Joint Entrance Examination—are analytically demanding. The challenge is that they stand today as the only signal reaching students, parents and schools—and that signal asks nothing about building, making or the hands-on work that defines an engineer. This signal shapes the behaviour at every level in society.

We propose a 'maker portfolio' as a supplementary admissions component. Structured documentation of sustained, hands-on work—a project designed and built, a device assembled, an experiment run. It need not be sophisticated, but it must be real. Candidates would still clear the JEE; after that threshold, the portfolio would carry meaningful weight—as a tie-breaker, bonus or a dedicated pathway for a small number of seats. Once that signal lands and behaviour changes, students tinker, parents stop dismissing making, schools create space for projects.

Forming builders in schools: The science curriculum in grades 9-12 is heavily weighted toward abstract theory and examination-ready content. Real-world applications—the very hook that makes science truly exciting for a 12-year-old—appear as sidebars rather than entry points.

Imagine, instead, a classroom where every student winds a coil and watches the small motor they have built begin to spin, or aligns lenses into a working telescope and turns it toward the moon. The brushless DC motor was conceived by engineers who had spent years with motors in their hands, not invested in a lecture hall.

School science textbooks for the grades should be reimagined around four principles: every concept grounded in a real-world application, regular open-ended projects rather than only confirmatory labs, every student producing a tangible artefact and non-essential topics excised to free classroom time for what matters. These artefacts feed directly into the maker portfolio—what you build in school can help you reach an elite engineering institution.

Forging teachers into builders: Most of India's school science teachers were themselves trained in the same theory-heavy, examination-oriented system within which they now teach. Many entered the profession before hands-on pedagogy was widely emphasised. They are part of a system that asked one thing of them in training and now asks something different in their classrooms.

We propose a national, mission-mode teacher training initiative anchored by the IITs and National Institutes of Technology. Their faculty would design and lead modular, practice-based programmes—low-cost experiments and the facilitation of open-ended student projects—through in-person workshops paired with sustained online mentoring. Teachers who have built become teachers who can teach others to build.

Making engineering colleges engineer: Suppose a student arrives at an engineering college genuinely excited to create. What do they typically find? More theory. More examinations. More lectures. Laboratory sessions, where they exist, are largely confirmatory—in a typical electrical engineering lab, students do not assemble circuits on breadboards but encounter pre-built apparatus on which they may only turn knobs and press buttons.

We propose a substantial transformation of the BTech curriculum: required, assessed exposure to fabrication, electronics and computational tools from the first year; multi-semester design-build-test projects that take a problem from concept to working prototype; and interdisciplinary studios, maker spaces and industry-linked challenges in place of some theory-heavy electives. Every graduate who leaves campus should be able to point to something they built, not just a transcript of courses passed.

Each of these reforms has been attempted, in isolation, somewhere in India over the past several decades. The overall system has not shifted. The reason is structural.

Reform undergraduate curriculums but leave admissions unchanged, and students arrive having optimised their adolescence for entrance examinations rather than for making. Reform school science but leave teacher training unchanged, and the new curriculum collects dust in a government document. Reform teacher training but leave admissions unchanged, and students and parents will rationally ignore making, because it carries no weight in the one thing that decides their future.

This is the structural truth of the pavilion. The only intervention that works raises all four pillars together, each to its full height, so that the same message—building matters—holds firm at every stage.

The maker portfolio must explicitly value low-cost, locally constrained forms of making. India already has over 10,000 Atal Tinkering Labs in schools across the country—many of them in government schools—and work produced in these labs should count directly toward the portfolio. What matters is not the sophistication of the tool but the evidence of genuine engagement. Designed with equity as a constraint, not an afterthought, these reforms can actively broaden access, not narrow it.

This proposal needs no new institution or regulatory body. NCERT can redesign school science textbooks; UGC can recognise experiential learning; the All India Council for Technical Education can mandate minimum hands-on credit requirements. IITs and NITs can pilot maker portfolio-based admissions and anchor national teacher training. Industry can contribute problem statements, mentors and commercialisation pathways.

What is needed is coordination and the political will to treat all four pillars as a single structure. These pillars can raise the roof—but they must come up together.

(Views are personal)

IIT-H gets India's first information museum

Interactive exhibits trace tech journey from computers to AI

RACHEL DAMMALA I DC
HYDERABAD, JUNE 29



Groundbreaking ceremony for the museum project IAM IGNITE being held on the IIT-H campus in Hyderabad.

From the rise of computers and the internet to artificial intelligence (AI), robotics and India's software revolution, the country's first Information Age Museum is set to come up at the Indian Institute of Technology Hyderabad (IIT-H), that will offer visitors a glimpse into the technologies that transformed modern life and those expected to shape the future.

The museum, titled IAM IGNITE (Information Age Museum – IGNITE), was launched by IIT Hyderabad in partnership with FORTESS (Forum of Erstwhile TCS Leaders and Leading IT Advisors). A groundbreaking ceremony for the project was held on the campus, with the museum expected to open by December 2026.

Unlike conventional museums that primarily preserve historical artefacts, the Information Age Museum will focus on technological evolution, innovation and future technologies through interactive exhibits, simulations, storytelling and digital experiences. Visitors will be able to explore subjects ranging from artificial intelligence, computing and communication technologies to robotics, automation, advanced manufacturing, Industry 4.0, entrepreneurship, aerospace and space technologies, an IIT-H representative told Deccan Chronicle.

The initiative also aims to document India's contribution to science, technology and digital transformation while creating an immersive learning space for students, researchers, entrepreneurs, educators and the general public.

IIT Hyderabad director Prof. B.S. Murty said the museum would help visitors understand how innovation evolved, and would inspire young people to become creators of future technologies. FORTESS vice-president S. Mahalingam said the initiative could develop into a national platform for innovation awareness and future-ready thinking, particularly among students. Curator Birad Yajnik said technology should not remain confined to laboratories but should inspire and benefit society at large.

The museum is also expected to strengthen IIT Hyderabad's outreach programmes for school students through guided visits, technology demonstrations and innovation-focused learning experiences.

Officials said the Hyderabad facility is envisioned as the first in a wider network of Information Age Museums planned across the country, aimed at making technology and innovation more accessible to the public.

Hans India

IIT Hyderabad celebrates world bicycle day with campus rally

HYDERABAD



THE Indian Institute of Technology Hyderabad (IITH) celebrated World Bicycle Day with a large-scale cycling rally that brought together more than 200 students, faculty members, staff, and campus residents. The event coincided with the institute receiving national recognition from the Fit India Movement as a Model Campus under the FIT India Vehicle-Free Campus Initiative, highlighting its efforts to promote sustainable mobility and healthier lifestyles.

The recognition was formally conferred by Fit India in Hyderabad on June 7. According to the institute, the award acknowledges its initiatives aimed at reducing dependence on motor vehicles, encouraging eco-friendly transportation, and fostering a culture of fitness and environmental responsibility within the campus community. As part of the World Bicycle Day celebrations, IITH organised a cycling rally under the nationwide "Sundays on Cycle" campaign of the Fit India Movement. The rally began at the SNCC Sports Complex and covered a route across the institute's sprawling 600-acre campus. Participants cycled along the same path used during the IITH Half Marathon, promoting cycling as a practical, affordable, and environmentally sustainable mode of transportation.

World Bicycle Day is observed globally to highlight the benefits of cycling for health, mobility, and environmental sustainability. Through initiatives such as "Sundays on Cycle," the Fit India Movement has sought to encourage citizens to adopt active lifestyles while contributing to efforts aimed at reducing pollution and promoting greener modes of transport. The recognition received by IIT Hyderabad reflects a series of measures implemented on campus to encourage sustainable mobility. The institute has actively promoted cycling and walking while working to reduce reliance on motor vehicles within its premises. These efforts are part of a broader focus on environmental sustainability and community well-being.

Prof. B.S. Murty, Director of IIT Hyderabad, said the institute views physical fitness, environmental responsibility, and academic excellence as interconnected goals. He noted that cycling not only contributes to individual health but also supports efforts to lower carbon emissions and create a cleaner campus environment.

Dr. Himanshu Joshi, Faculty In-Charge of Sports at IITH, said the enthusiastic participation in the rally reflected growing awareness among students and staff about the importance of fitness and sustainable living. He added that the institute's infrastructure and open spaces provide a conducive environment for promoting outdoor activities and healthy habits. Over the past few months, IIT Hyderabad has strengthened its sports and wellness initiatives through a range of events, including cycling campaigns, marathons, cyclathons, and the recently hosted Inter IIT Staff Sports Meet. These activities have encouraged participation from students, faculty, staff, and members of the wider community.

The institute continues to organise weekly "Sundays on Cycle" events, creating opportunities for regular physical activity while promoting cycling as a sustainable transport option. The initiative aligns with IITH's broader vision of fostering wellness, environmental awareness, and responsible citizenship.

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Source : https://epaper.thehansindia.com/

IIT-H Jumps 76 Places In QS World Rankings

IIT-Hyderabad makes impressive leap from 664 to 588 as it seeks to expand its global footprint through industry-backed PhDs & sustainability initiatives

ManviVyas@timesofindia.com

Buoyed by research and international collaborations, the Indian Institute of Technology Hyderabad (IIT-H) saw its QS World University Ranking jump 76 places, from 664 to 588, marking the institute's most significant leap on the global charts to date. As per the rankings, released on Thursday, IIT-H also scored well in sustainability and academic reputation.

Citations per faculty high

But research citations remained the strongest driver of this growth. The metric measures how often IIT-H's published work is referenced by researchers around the world, and the institute recorded one of its best-ever performances on this parameter this year.

"Our strongest parameter continues to be citations per faculty," said Prof Saurabh Shandilya, the institute's QS ranking nodal coordinator, stating how IIT-H has emerged as one of India's fastest-growing technology institutions. "International research collaborations is another area where we performed strongly," he added.

Among the many research projects, across strategic areas, that IIT-H is driving at the moment are those in 6G communications, autonomous navigation, semiconductors, AI-embedded engineering, healthcare and quantum technologies, and smart mobility among others.

Strong partnerships

The institute's long-running partnership with the Japan International Cooperation Agency (JICA), which covers joint research, faculty exchanges and access to Japanese funding, too has supported its in-

RESEARCH CITATIONS FUEL GLOBAL ASCENT

- **588** IIT-H's highest-ever position in the rankings
- **76** places climbed in QS World University Rankings
- **25** product PhDs funded by industry
- **50%** bicycle subsidy for students paid for by IIT-H
- **3** IIT-H start-ups featured among 130 Indian innovations showcased in France

FUTURE TECHNOLOGIES

- Research underway in 6G, AI, semiconductors, quantum tech, smart mobility, healthcare innovations
- Sustainability measures at IIT-H include solar power generation, campus shuttle services and bicycle subsidy
- Sustainability is helping propel the institute's growth. In fact, it has been the second major contributor to this jump in ratings — **Saurabh Shandilya** | IIT-H PROFESSOR

FRANCE EVENT A NEW HIGH

The week added another feather to IIT-H's cap. At an event in France where India showcased 130 startups and technologies from higher education institutions, three were from the premier institute in the city. The event was attended by roughly 2,500 investors and corporates, inaugurated by Prime Minister Narendra Modi alongside the French president.

ternational score for several years. "We are also expanding partnerships with universities in Europe and the US.

Faculty role noted

IIT-H director, Prof BS Murthy, credited the result to the people behind it and said that it was because of a "lot of hard work by the brilliant faculty" and "an excellent student base". He was, however, quick to add that ranking itself is not what the institute is chasing. "While the rankings are important, what is more important is the byproduct of this ranking," he said. The institute's priority is promoting product-based PhDs, a model in which industry directly funds a research scholar to develop a specific product. This year, 25 such positions have been opened for the first time at IIT-H. "India needs builders who can come up with technologies and products for India to not only become Atmanirbhar but also contribute towards a Viksit Bharat," Murthy said.



Hans India



Union Minister G Kishan Reddy and former DRDO Chairman G Satheesh Reddy, along with Prof. B S Murty, Director of IIT Hyderabad, and Prof. Y L Srinivas, Vice-Chancellor of Sammakka Sarakka Central Tribal University, Mulugu, at the signing of a landmark MoU to strengthen academic collaboration

IIT Hyd, Sammakka Sarakka Tribal University ink pact for technical education

HANS NEWS SERVICE
HYDERABAD

THE Indian Institute of Technology Hyderabad and Sammakka Sarakka Central Tribal University, Mulugu, have entered into a landmark Memorandum of Understanding to strengthen academic collaboration and enhance higher education opportunities for tribal students. The agreement was signed in the presence of Union Minister G Kishan Reddy and former DRDO Chairman G Satheesh Reddy. Prof BS Murty, Director of IITH, and Prof YL Srinivas, Vice-Chancellor of SSCTU, represented their respective institutions during the event. This partnership focuses on curriculum development, with IITH designing NEP-aligned frameworks for the upcoming academic programmes of the tribal university.

In addition to faculty training, IITH will conduct mentoring, pedagogical workshops, and training sessions for SSCTU staff. From the academic year 2026–27, the university will offer advanced programmes including BTech in Computer Science and AI, BS in Mathematics and Computing, and BS in Computer Science and Data Analytics. IITH will also help strengthen laboratory facilities and research readiness. Under the MoU, student development programmes such as internships, workshops, expert lectures, and seminars will be organised for the benefit of both students and faculty. This collaboration is expected to provide a significant boost to the educational landscape of Mulugu and surrounding regions, ensuring that students from tribal and rural backgrounds gain access to cutting-edge technical education. Prof Murty emphasised that the mentorship would help build strong institutional capacity, while Prof Srinivas noted that the partnership will open new opportunities for tribal students to pursue careers in emerging fields like AI and data science, bridging the gap between rural talent and global technology standards through persistent support and academic excellence.

11/04/2026 HYDERABAD Pg 04



IIT-Hyderabad marks 18th Foundation Day

Empowering humanity must remain at the core of progress, said Prakash Amte, a doctor, social worker and Ramon Magsaysay awardee. Delivering the Foundation Day lecture at the 18th Foundation Day celebrations of IIT-Hyderabad on Tuesday, he highlighted sustainability and human-centric innovation. The event included the announcement of 218 awards recognising excellence in academics, teaching, research, and work efficiency. Endowment awards instituted by donors were also presented to students.

మానవత్వమే నిజమైన పురోగతి!

- ఐఐటీ హైదరాబాద్ 18వ స్థాపన దినోత్సవం
- సాంకేతికత మానవ సేవకే కావాలి
- డాక్టర్ ప్రకాష్ బాబా ఆమ్టే



సంగారెడ్డి, ఏప్రిల్ 28 (జనం పవర్): సమాజ సంక్షేమం, స్థిరమైన అభివృద్ధి, మానవ సేవలే నిజమైన పురోగతికి ప్రమాణాలని ప్రముఖ మానవతావాది డాక్టర్ ప్రకాష్ బాబా ఆమ్టే పేర్కొన్నారు. భారతీయ సాంకేతిక విద్యాసంస్థ హైదరాబాద్ (ఐఐటీ హైదరాబాద్) 18వ స్థాపన దినోత్సవ వేడుకలు సోమవారం ఘనంగా జరిగాయి. కంది క్యాంపస్‌లో నిర్వహించిన ఈ కార్యక్రమానికి ఆయన ముఖ్య అతిథిగా హాజరయ్యారు. ఐఐటీ హైదరాబాద్ తక్కువ కాలంలోనే సాధించిన విశేష ప్రగతిని ఈ సందర్భంగా ఆయన ప్రశంసించారు.

సాంకేతికత - మానవత్వం

సాంకేతికతను మానవ సేవకు వినియోగించే దిశగా సంస్థ అడుగులు వేయడం అభినందనీయమని ఆమ్టే పేర్కొన్నారు. 6జీ, స్వయంచాలక వ్యవస్థలు వంటి ఆధునిక రంగాల్లో ఐఐటీ హైదరాబాద్ చేస్తున్న కృషి గొప్పదన్నారు. ప్రకృతితో విద్యార్థుల అనుబంధాన్ని పెంపొందించడం స్ఫూర్తిదాయకమని చెప్పారు. మానవ సేవే ప్రతి అభివృద్ధికి కేంద్రబిందువుగా ఉండాలని.. అప్పుడే అది నిజమైన పురోగతి అని ఆయన స్పష్టం చేశారు.

పరిశోధనలే లక్ష్యం

ఐఐటీ హైదరాబాద్ డైరెక్టర్ ప్రొఫెసర్ బీఎస్ మూర్తి మాట్లాడుతూ.. 18 ఏళ్ల ప్రయాణంలో తమ సంస్థ అగ్రశ్రేణి విద్యాసంస్థగా ఎదిగిందని చెప్పారు. డీప్ టెక్ పరిశోధన, భవిష్యత్ అవసరాలకు అనుగుణమైన ప్రతిభను తీర్చిదిద్దడమే తమ లక్ష్యమని వివరించారు. దేశాభివృద్ధికి దోహదపడే ఆవిష్కరణలను ఎల్లప్పుడూ ప్రోత్సహిస్తామని పేర్కొన్నారు. పరిశోధన, ఆవిష్కరణ, విద్యను సమన్వయం చేస్తూ ప్రపంచ స్థాయి కేంద్రంగా సంస్థ ముందుకు సాగుతోందని తెలిపారు.

పురస్కారాల ప్రదానం

వివిధ రంగాల్లో ప్రతిభ కనబరిచిన విద్యార్థులు, అధ్యాపకులు, సిబ్బందికి ఈ సందర్భంగా పురస్కారాలు అందజేశారు. మొత్తం 218 అవార్డులను అతిథులు ప్రదానం చేశారు. దాతల ఆధ్వర్యంలో ఏర్పాటు చేసిన ఎండోమెంట్ అవార్డులను కూడా విద్యార్థులకు అందజేశారు. ఈ వేడుకల్లో విద్యాసంస్థకు చెందిన పలువురు ప్రముఖులు, విద్యార్థులు పెద్ద సంఖ్యలో పాల్గొన్నారు.

వేగంగా అభివృద్ధి

2008లో ప్రారంభమైన ఐఐటీ హైదరాబాద్.. కృత్రిమ మేధస్సు, స్మార్ట్ మొబిలిటీ, ఆరోగ్య సాంకేతికత వంటి రంగాల్లో దేశవ్యాప్తంగా గుర్తింపు పొందింది. ప్రస్తుతం 340 కి పైగా అధ్యాపకులు, 5,700 కి పైగా విద్యార్థులతో దేశంలోనే వేగంగా అభివృద్ధి చెందుతున్న విద్యాసంస్థలలో ఒకటిగా నిలిచింది. మానవాళి కోసం సాంకేతికతలో ఆవిష్కరణ అనే లక్ష్యంతో సంస్థ మరింత ముందుకు సాగుతోందని అధికారులు వివరించారు.

DNP Sets Up First India R&D Centre at IIT Hyderabad, Strengthens Indo–Japan Innovation Partnership.

Sangareddy, Correspondent : April 30, 2026: Dai Nippon Printing Co. Ltd. (DNP) has inaugurated its first Research & Development (R&D) centre in India at the Indian Institute of Technology Hyderabad (IITH), marking a significant milestone in India–Japan technological collaboration. This facility is also DNP's second overseas R&D base globally.

Located at the IITH Technology Research Park (TRP), the centre will focus on cutting-edge research in electric mobility and healthcare, particularly in wireless power transfer systems for electric vehicles (EVs) and the development of Active Pharmaceutical Ingredients (APIs).

The inauguration ceremony was attended by prominent dignitaries, including Mr. Muneo Takahashi, Consul General of Japan; Mr. Osamu Nakamura, Senior Managing Director of DNP; and Prof. B S Murty, Director of IITH, along with representatives from industry, academia, and government.

The facility aims to foster strong industry–academia collaboration by combining IITH's research expertise with DNP's advanced technological capabilities. It is expected to accelerate innovation and enable faster commercialization of next-generation technologies for both domestic and global markets.

Hyderabad's growing prominence as a hub for mobility innovation, pharmaceuticals, semiconductors, and advanced manufacturing further enhances the strategic value of this partnership, with opportunities to expand into Middle East and African markets.

In the mobility sector, the centre will focus on designing and demonstrating wireless EV charging systems, while in healthcare, it will work on scalable and efficient synthesis processes for APIs, contributing to affordable and accessible medicines.

Speaking on the occasion, Prof. B S Murty said the initiative would strengthen global industry–academia collaboration and reinforce IITH's role in addressing critical challenges through translational research.



Mr. Osamu Nakamura noted that the new centre aligns with DNP's vision of creating future standards by combining its technological strengths with IITH's expertise, particularly in mobility and healthcare sectors.

The collaboration is also expected to promote talent development, knowledge exchange, and joint innovation programmes, offering students and researchers opportunities to work on globally relevant technologies.

With this development, IIT Hyderabad continues to expand its Technology Research Park ecosystem, attracting leading global companies and fostering a dynamic environment for research, development, and commercialization.

BIZZ BUZZ

India–Japan partnership deepens as JICA backs digital transformation hub at IIT Hyd



Officials of the Japan International Cooperation Agency at the inauguration of AGC Asia Pacific (India) Pvt. Ltd. and AAPI Innovation Hub (AI-Hub) at IIT Hyderabad campus in Hyderabad on Thursday

HYDERABAD

THE Japan International Cooperation Agency (JICA) attended the inauguration of the AGC Asia Pacific (India) Pvt. Ltd., AAPI Innovation Hub (AI-Hub) at the campus of Indian Institute of Technology Hyderabad (IIT-H), on May 21, 2026, marking a significant step toward strengthening digital transformation (DX) talent development and industry - academia collaboration in India. The inauguration ceremony was attended by key representatives from IIT-H, JICA, and other distinguished representatives from academia, industry, and government agencies.

Established in partnership with IIT-H, the AI- Hub aims to promote technological advancement and foster practical skill development through internships, joint research programs, and collaborative innovation initiatives. The hub is expected to support AGC's broader DX efforts by creating opportunities for students and researchers to work on real-world industry challenges while contributing to the advancement of emerging technologies.

AGC Asia Pacific India and IIT-H have previously collaborated on internships and joint research initiatives, particularly in the field of Artificial Intelligence (AI). Building on the success of these engagements, AI- Hub will further deepen and expand its collaboration with IIT-H in a more strategic and sustained manner.

Speaking on the occasion, Mr. TAKEUCHI Takuro, Chief Representative, JICA India, said, "India and Japan share a vision rooted in innovation, technology, and human capital development. AI-Hub in India reflects the growing strength of the Indo-Japan partnership where digital transformation is not only advancing industrial competitiveness but also nurturing globally skilled talent.

Through collaborative innovation, knowledge exchange, and technology-led growth, such initiatives will further deepen bilateral cooperation and contribute to building resilient and future-ready industries across both nations." The initiative forms part of the AGC Group's ongoing digital transformation (DX) efforts in India and reinforces its commitment to open innovation, talent development, and technological excellence.

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Source : https://epaper.bizzbuzz.news/

Hans India

IIT Hyderabad introduces residential programme on nuclear technology



HYDERABAD: The Indian Institute of Technology Hyderabad (IITH), in collaboration with Crimson Energy Experts Pvt. Ltd. (CEEPL), has announced the launch of the Nuclear Technology Orientation Programme (NTOP), a three-month residential programme aimed at building knowledge and skills in nuclear energy technologies and operations.

The programme, scheduled to begin on August 3, 2026, at the IITH campus, has been designed to provide engineers and industry professionals with a comprehensive understanding of nuclear power generation, safety systems, regulatory frameworks and emerging technologies in the sector.

The initiative comes at a time when India is expanding its clean energy portfolio and increasing its focus on nuclear power as part of its long-term energy strategy. As new projects and technologies emerge, the demand for professionals with specialized knowledge of nuclear systems is expected to grow across the energy and infrastructure sectors.

According to IITH, the programme is intended for early- and mid-career engineers, managers from engineering, procurement and construction (EPC) companies, manufacturing professionals, consultants, power sector personnel and executives working in public sector enterprises involved in energy development. The curriculum combines academic learning with industry perspectives and covers a broad range of topics related to nuclear technology. Participants will study reactor physics, reactor engineering, radiation shielding, nuclear safety, waste management, thermal hydraulics, reactor instrumentation and control systems, quality assurance, emergency preparedness and advanced nuclear technologies, including Small Modular Reactors (SMRs).

A key feature of the programme is the participation of faculty members from IITH along with experienced scientists and engineers who have worked with major Department of Atomic Energy (DAE) institutions, including the Nuclear Fuel Complex (NFC), Bhabha Atomic Research Centre (BARC), Nuclear Power Corporation of India Limited (NPCIL) and BHAVINI.

These experts bring practical experience in reactor design, manufacturing, operations and regulatory compliance.

Speaking about the programme, Prof. B.S. Murty, Director of IITH, said that nuclear energy is expected to play an increasingly important role in supporting India's future energy requirements and sustainability goals. He noted that the programme seeks to contribute to workforce development by combining academic expertise with industry knowledge.

The programme will conclude with the award of a joint certificate from IIT Hyderabad and Crimson Energy Experts Pvt. Ltd. Organisers said the initiative will also provide opportunities for interaction among professionals, researchers, industry experts and stakeholders involved in the country's nuclear energy ecosystem. The launch of NTOP reflects the growing emphasis on specialized professional education programmes aimed at supporting emerging sectors and strengthening technical capabilities in strategic industries.

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Source : https://epaper.thehansindia.com/

ABN ఆంధ్రజ్యోతి

ఐఐటీహెచ్‌లో జపాన్ పరిశోధనా కేంద్రం ప్రారంభం

- ఈవీ, క్లీన్ ఎనర్జీ రంగాల్లో సంయుక్త ఆవిష్కరణలు
- క్లీన్ ఎనర్జీ అండ్ నెట్ జీరో భవనానికి శంకుస్థాపన

కంది, ఏప్రిల్ 30 (ఆంధ్రజ్యోతి) : సంగారెడ్డి జిల్లా కందిలోని ఐఐటీ హైదరాబాద్ (ఐఐటీహెచ్) అంతర్జాతీయ పరిశోధనలకు వేదికగా నిలుస్తోంది. జపాన్‌కు చెందిన ప్రముఖ సంస్థ డై నిప్పాన్ ప్రింటింగ్ కో లిమిటెడ్ (డీఎన్‌పీ) తన తొలి భారతీయ పరిశోధన, అభివృద్ధి (ఆర్‌అండ్‌డీ) కేంద్రాన్ని ఐఐటీహెచ్‌లో గురువారం ప్రారంభించింది. ఐఐటీ హెచ్ డైరెక్టర్ ప్రొఫెసర్ బీవీఎస్ మూర్తి జపాన్ శాస్త్రవేత్తలతో కలిసి ఈ కేంద్రాన్ని ప్రారంభించారు. డీఎన్‌పీకి ప్రపంచవ్యాప్తంగా ఇది రెండో విదేశీ ఆర్‌అండ్‌డీ కేంద్రం కావడం విశేషం. ఐఐటీహెచ్ టెక్నాలజీ రీసెర్చ్ పార్క్‌లో ఏర్పాటు చేసిన ఈ కేంద్రం ద్వారా ఎలక్ట్రిక్ వాహనాలు (ఈవీ), హెల్త్‌కేర్, అడ్వాన్స్‌డ్ మెటీరియల్, ప్రింటింగ్ టెక్నాలజీ వంటి రంగాల్లో ఇరు దేశాల శాస్త్రవేత్తలు సంయుక్త పరిశోధనలు చేపట్టనున్నారు. ఇండస్ట్రీ-అకాడెమియా భాగస్వామ్యానికి ఇది ఒక కీలక మైలురాయిగా నిలవనుంది. ఈ భాగస్వామ్యం ఇండియా- జపాన్ మధ్య సాంకేతిక సహకారాన్ని బలోపేతం చేయడమే కాకుండా, విద్యార్థులకు అంతర్జాతీయ స్థాయి నైపుణ్యాలను పెంపొందించే అవకాశం కల్పిస్తుంది.





జపాన్ శాస్త్రవేత్తలతో కలసి డీఎన్‌పీ ఆర్‌అండ్‌డీ పరిశోధన భాగస్వామ్య ఒప్పంద ప్రతాలను చూపుతున్న ఐఐటీహెచ్ డైరెక్టర్ బీవీఎస్ మూర్తి, భవన నిర్మాణానికి శంకుస్థాపన చేస్తున్న డైరెక్టర్

క్లీన్ ఎనర్జీ లక్ష్యంగా మరో అడుగు

ఐఐటీహెచ్ ప్రాంగణంలో 'సెంటర్ ఆఫ్ ఎక్సలెన్స్ ఫర్ క్లీన్ ఎనర్జీ అండ్ నెట్ జీరో' భవన నిర్మాణానికి ప్రొఫెసర్ బీవీఎస్ మూర్తి శంకుస్థాపన గురువారం చేశారు. పర్యావరణానికి హాని చేయని సౌర, గాలి వంటి పునరుత్పాదక ఇంధన వనరుల అభివృద్ధి, వాతావరణంలో కార్బన్ విడుదలను నున్నా స్థాయికి (నెట్ జీరో) తీసుకురావడమే ఈ కేంద్రం ప్రధాన లక్ష్యం. కోర్ ల్యాబ్ సమీపంలో నిర్మించనున్న ఈ భవనానికి కేంద్ర విద్యాశాఖ, పాన్ ఐఐటీ అలూమ్ని ఇండియా మద్దతు అందిస్తున్నాయి. కాలుష్య నియంత్రణ టెక్నాలజీలు, వాతావరణ మార్పుల పరిష్కారాలపై ఇక్కడ ప్రపంచ స్థాయి పరిశోధనలు జరుగుతాయని అధికారులు వెల్లడించారు. ఈ కొత్త కేంద్రాల ఏర్పాటుతో ఐఐటీ హైదరాబాద్ గ్లోబల్ ఇన్నోవేషన్ హబ్‌గా తన స్థానాన్ని మరింత సుస్థిరం చేసుకోనుంది.

ఐఐటీ హైదరాబాద్‌లో డీఎన్‌పీ తొలి భారతీయ ఆర్‌అండ్‌డీ కేంద్రం ప్రారంభం

■ భారత్‌--జపాన్ అభివృద్ధిలో భాగస్వామ్యానికి కొత్త ఊపు ఎలక్ట్రిక్ మొబిలిటీ, ఆరోగ్య రంగాల్లో సంయుక్త పరిశోధనకు ఛాన్సులు.







హైదరాబాద్, ఏప్రిల్ 29 (ఆంధ్ర జ్యోతి బ్యూరో) :

ఆసియాకు చెందిన ప్రముఖ సంస్థ డై నిప్పాన్ ప్రింటింగ్ జపాన్ లిమిటెడ్ (డీఎన్‌పీ) తన తొలి భారతీయ ఆర్‌అండ్‌డీ కేంద్రాన్ని ఇండియన్ ఇన్‌స్టిట్యూట్ ఆఫ్ టెక్నాలజీ హైదరాబాద్ (ఐఐటీ హైదరాబాద్) క్యాంపస్‌లో ప్రారంభించింది. ఈ కేంద్రం ద్వారా డీఎన్‌పీ ప్రపంచవ్యాప్తంగా రెండు దశాబ్దాలకు పైగా అనుభవం ఉన్న ఎలక్ట్రిక్ మొబిలిటీ, హెల్త్‌కేర్ రంగాల్లో కొత్త ఉత్పత్తులు, సాంకేతిక పరిష్కారాలపై దృష్టి సారించనుంది. ఈ కేంద్రాన్ని ఐఐటీ హైదరాబాద్ డైరెక్టర్ ప్రొఫెసర్ బీవీఎస్ మూర్తి, డీఎన్‌పీ ఇండియా ప్రతినిధులు, అధికారులు కలిసి ప్రారంభించారు. ఈ సందర్భంగా ఏర్పాటు చేసిన సమావేశంలో ఇరు సంస్థల ప్రతినిధులు మాట్లాడారు. ఈ కేంద్రం ద్వారా ఎలక్ట్రిక్ మొబిలిటీ, ఆరోగ్య రంగాల్లో ఉమ్మడి పరిశోధనలు చేపట్టనున్నట్లు వారు తెలిపారు. ఈ సందర్భంగా డీఎన్‌పీ ఇండియా ప్రతినిధులు మాట్లాడుతూ.. ఈ కేంద్రం ద్వారా ఎలక్ట్రిక్ మొబిలిటీ, ఆరోగ్య రంగాల్లో కొత్త ఉత్పత్తులు, సాంకేతిక పరిష్కారాలపై పరిశోధనలు చేపట్టనున్నట్లు తెలిపారు

అక్షిత
శనివారం మే 16, 2026

భారత తొలి స్వదేశీ భారీ గ్యాస్ అటమైజర్ అభివృద్ధికి శ్రీకారం

-ఐఐటీ హైదరాబాద్-డీఆర్‌డీఎల్-
ఇన్నోమెట్ సంయుక్త భాగస్వామ్యం



సంగారెడ్డి, అక్షిత బ్యూరో: భారతీయ సాంకేతిక విద్యాసంస్థ హైదరాబాద్, రక్షణ పరిశోధనా సంస్థకు చెందిన డిఫెన్స్ మెటలర్జికల్ రీసెర్చ్ లాబొరేటరీ, హైదరాబాద్‌కు చెందిన సంయుక్తంగా భారతదేశపు తొలి స్వదేశీ భారీ స్థాయి 100 కిలోల ఇనర్ట్ గ్యాస్ అటమైజర్ అభివృద్ధికి శ్రీకారం చుట్టాయి. ఇండిజినస్ డెవలప్‌మెంట్ ఆఫ్ లార్జ్ స్కేల్ (100 కేజీ) ఇనర్ట్ గ్యాస్ అటమైజర్' పేరుతో చేపట్టిన ఈ ప్రాజెక్టుకు డీఆర్‌డీవో అధ్వర్యంలోని డైరెక్టరేట్ ఆఫ్ మ్యూనిషన్స్ టెక్నాలజీ మేనేజ్‌మెంట్ మద్దతుతో, వారణాసిలోని ఐఐటీ బీహెచ్‌యూలో ఉన్న డీఆర్‌డీవో-ఇండస్ట్రీ-అకాడెమియా సెంటర్ ఆఫ్ ఎక్సలెన్స్ నిధులు సమకూరుస్తోంది. ఈ ప్రాజెక్టు ద్వారా దేశంలోనే అత్యాధునిక పారిశ్రామిక స్థాయి గ్యాస్ అటమైజేషన్ సౌకర్యాన్ని ఏర్పాటు చేసి, ఏరోస్పేస్, రక్షణ, ఇంధన అధునాతన తయారీ రంగాలకు అవసరమైన అధిక నాణ్యత గల గోళాకార లోహ మిశ్రమ పొడులను తయారు చేయనున్నారు. ఈ పొడులు అడిటివ్ తయారీ (3డీ ముద్రణ), హాట్ ఐసోస్టాటిక్ ప్రెస్సింగ్, రక్షణ ఉపరితల పూతలు, గ్యాస్ టర్బైన్ ఇంజిన్ల, అధిక ఉష్ణోగ్రతలను తట్టుకునే సూపర్ అల్లాయ్ భాగాల తయారీలో కీలకంగా ఉపయోగపడనున్నాయి. ఈ భాగస్వామ్య సంస్థలు గతంలో అభివృద్ధి చేసిన 10 కిలోల స్వదేశీ గ్యాస్ అటమైజర్ విజయానికి కొనసాగింపుగా, ఇప్పుడు భారీ స్థాయి 100 కిలోల సౌకర్యాన్ని అభివృద్ధి చేస్తున్నాయి. ఈ కేంద్రంలో ఏరోస్పేస్ రంగానికి అవసరమైన నికెల్ ఆధారిత సూపర్ అల్లాయ్‌లు, అణు మరియు తాప విద్యుత్ వ్యవస్థల కోసం ప్రత్యేక ఉక్కులు, రక్షణ పూతల కోసం కోబాల్ట్ ఆధారిత మిశ్రమాలు, నూతన తరం హై-ఎంట్రోపీ అల్లాయ్‌ల తయారీపై దృష్టి సారించనున్నారు. భారీ స్థాయి అటమైజర్ సౌకర్యాన్ని హైదరాబాద్‌లోని ఇన్నోమెట్ ప్రాంగణంలో ఏర్పాటు చేయనున్నారు. ప్రాజెక్టు పూర్తైన అనంతరం ఐదు సంవత్సరాల పాటు ఈ సౌకర్యాన్ని డీఆర్‌డీవో, ఐఐటీ హైదరాబాద్ పరిశోధన కార్యకలాపాలకు అందుబాటులో ఉంచనున్నారు. ఈ భాగస్వామ్యం ద్వారా జాతీయ ప్రయోగశాలలు, విద్యాసంస్థలు, పరిశ్రమల మధ్య సమన్వయం మరింత బలపడుతుందని, దేశ రక్షణ, ఏరోస్పేస్, అధిక పనితీరు గల పదార్థాల తయారీ సామర్థ్యాలు గణనీయంగా పెరుగుతాయని నిపుణులు అభిప్రాయపడుతున్నారు. ఐఐటీ హైదరాబాద్ డైరెక్టర్ మాట్లాడుతూ, అధునాతన పదార్థాలు, వ్యూహాత్మక తయారీ సాంకేతికతలలో స్వావలంబన సాధించే భారతదేశ ప్రయాణంలో ఇది కీలక మైలురాయి. దేశ భవిష్యత్ తయారీ రంగానికి అవసరమైన సాంకేతికతల అభివృద్ధిలో భాగస్వామ్యం కావడం గర్వకారణం అని తెలిపారు. ఇన్నోమెట్ సంస్థ ప్రతినిధులు మాట్లాడుతూ, స్వదేశీ గ్యాస్ అటమైజర్ అభివృద్ధి కార్యక్రమంలో పరిశ్రమ భాగస్వామిగా అవకాశం కల్పించిన ఐఐటీ హైదరాబాద్, ఐఐటీ బీహెచ్‌యూ, డీఆర్‌డీవో మరియు డీఎంఆర్‌ఎల్ సంస్థలకు కృతజ్ఞతలు తెలిపారు. 'ఆత్మనిర్భర్ భారత్' లక్ష్య సాధనలో ఈ ప్రాజెక్టు కీలక పాత్ర పోషిస్తుందని పేర్కొన్నారు.

ABN ఆంధ్రజ్యోతి

ఐఐటీహెచ్‌లో 'కాంతి' విప్లవం



● రక్షణ, వైద్య, కమ్యూనికేషన్ రంగాల్లో సరికొత్త ఆవిష్కరణలే లక్ష్యం

కర్టెన్ రైజర్ కార్యక్రమంలో ఐఐటీహెచ్ డైరెక్టర్ బీఎస్ మూర్తి, పరిశోధకులు, విద్యార్థులు

కంది, మే 22 (ఆంధ్రజ్యోతి) : సాంకేతిక పరిశోధనల్లో సరికొత్త శిఖరాలను అధిరోహిస్తున్న భారతీయ సాంకేతిక విజ్ఞాన సంస్థ (ఐఐటీ) హైదరాబాద్ మరో ప్రతిష్ఠాత్మక అంతర్జాతీయ వేదికకు సన్నద్ధమైంది. కాంతి విజ్ఞానం (ఆప్టిక్ అండ్ ఫోటోనిక్స్) సరిహద్దులను విస్తరిస్తూ, భవిష్యత్ సాంకేతికతకు దిక్సూచిగా నిలవనున్న 'ఫోటోనిక్స్-2026' అంతర్జాతీయ సదస్సుకు ఐఐటీ హైదరాబాద్ శ్రీకారం చుట్టింది. అంతర్జాతీయ కాంతి దినోత్సవాన్ని పుర స్కరించుకుని శుక్రవారం ఆ సంస్థ ఆవరణలో 'కర్టెన్ రైజర్' కార్యక్రమాన్ని నిర్వహించారు. ఫోటోనిక్స్, ఆప్టికల్ సైన్సెస్ రంగాల్లో వస్తున్న విప్లవాత్మక మార్పులు, నూతన ధోరణులు, పరిశోధన అవకాశాలపై దేశ, విదేశాలకు చెందిన ప్రసిద్ధ శాస్త్రవేత్తలు, నిపుణులు ఇందులో విస్తృతంగా చర్చించారు. ఈ సాంకేతికత మానవ జీవన విధానాన్ని పూర్తిగా మార్చేయగలదు అని అంతర్జాతీయ ప్రతినిధులు అభిప్రాయపడ్డారు. ప్రపంచ స్థాయి పరిశోధనకు భారత్ నుంచి ఊతమివ్వడమే లక్ష్యంగా ఫోటోనిక్స్-2026ను డిజైన్ చేసినట్లు ఐఐటీహెచ్ డైరెక్టర్ బీఎస్ మూర్తి తెలిపారు. ఈ సదస్సు పూర్తి వివరాలు, రిజిస్ట్రేషన్ ప్రక్రియ, పరిశోధక పత్రాల సమర్పణ వంటి వివరాలన్నింటినీ అధికారిక వెబ్‌సైట్‌లో అందుబాటులో ఉంచినట్లు నిర్వాహక కమిటీ వెల్లడించింది.

ABN ఆంధ్రజ్యోతి



కాశీ పట్టణంలోని చారిత్రక కట్టడాలు

ప్రాచీన ఆలయాలకు శాశ్వత 'ఆయుష్షు'

(మొదటి పేజీ తరువాయి)

పరిధిలోని ఐఐటీ హైదరాబాద్ నడుం బిగించింది. ఐఐటీహెచ్ డిజైన్ విభాగానికి చెందిన డాక్టర్ శివాజీ ఆధ్వర్యంలో ఎస్‌హెచ్‌ఆర్‌ఐ ప్రాజెక్టు ద్వారా కాశీలోని 5 చారిత్రక ఆలయాల డిజిటల్ పరిరక్షణ పనులు వేగంగా సాగుతున్నాయి. ఆలయాల నిర్మాణ శైలి, చారిత్రక ప్రాధాన్యత, వాతావరణ మార్పుల ప్రభావంపై సమగ్ర అధ్యయనం నిర్వహిస్తున్నారు. ఈ ప్రాజెక్టు కోసం ప్రపంచస్థాయి అత్యాధునిక సాంకేతిక పరిజ్ఞానాన్ని ఐఐటీహెచ్ పరిశోధకులు వినియోగిస్తున్నారు. హై రిజల్యూషన్ త్రీడీ డాక్యుమెంటేషన్‌తో ఆలయాలకు సంబంధించిన ప్రతి అంగుళాన్ని క్షుణ్ణంగా రికార్డ్ చేయడం, జీఐఎస్ ఆధారిత మ్యాపింగ్, ఫొటోగ్రామెట్రీ ఆధారంగా భౌగోళిక, నిర్మాణ లెక్కింపులతో కచ్చితమైన నమూనాలు తయారు చేస్తున్నారు. వర్చువల్ రియాలిటీ(వీఆర్), ఆగ్మెంటెడ్ రియాలిటీ(ఏఆర్) టెక్నాలజీ ద్వారా భవిష్యత్తులో భక్తులు, పరిశోధకులు ప్రపంచంలో ఎక్కడున్నా .. నిజంగా కాశీ ఆలయంలోనే ఉన్నామనే అనుభూతిని పొందేలా డిజిటల్ నమూనాలను సృష్టిస్తున్నారు.

భవిష్యత్ తరాల కోసమే : ఐఐటీహెచ్ ప్రా. శివాజీ

డిజిటల్ సంరక్షణ ద్వారా ఆలయాల నమూనాలు శాశ్వతంగా భద్రంగా ఉంటాయని ఐఐటీహెచ్ ప్రొఫెసర్ డాక్టర్ శివాజీ పేర్కొన్నారు. ఆధ్యాత్మిక వైభవం చెక్కుచెదరకుండా రేపటి తరాలకు సురక్షితంగా అందించాలనే మహత్తర లక్ష్యంతోనే అత్యాధునిక డిజిటల్ టెక్నాలజీతో కాశీలోని చారిత్రక దేవాలయాలను డిజిటలైజ్ చేసేందుకు శ్రీకారం చుట్టినట్లు తెలిపారు.

ABN ఆంధ్రజ్యోతి

డ్రగ్స్‌కు నో... ఆరోగ్యకర జీవితానికి ఓటు!

● ఐఐటీ హైదరాబాద్‌లో 'నషా ముక్త్ భారత్' ప్రతిజ్ఞ ● మత్తు రహిత సమాజ నిర్మాణమే లక్ష్యం

కంది, జూన్ 24 (ఆంధ్రజ్యోతి) : మత్తు పదార్థాల నిర్మూలానికి పూర్తిస్థాయిలో కృషి చేస్తామని ఐఐటీ హైదరాబాద్ డైరెక్టర్ బీఎస్ మూర్తి ప్రతిజ్ఞ చేశారు. ఐఐటీ హైదరాబాద్ ప్రాంగణంలో మంగళవారం 'నషా ముక్త్ భారత్ అభియాన్' (మత్తు రహిత భారత ప్రచారం) కార్యక్రమంలో భాగంగా సంగారెడ్డి జిల్లా కంది ఐఐటీ హైదరాబాద్‌లో ప్రగ్ ఫ్రీ ఇండియా ప్రతిజ్ఞ కార్యక్రమాన్ని ఘనంగా నిర్వహించారు. ఈ సందర్భంగా ఐఐటీహెచ్ విద్యార్థులు, అధ్యాపకులు, వివిధాలయా సిబ్బంది అంతా ఏకతాటిపైకి వచ్చి, తాము జీవితంలో ఎప్పటికీ మత్తు పదార్థాలకు దూరంగా ఉంటామని ప్రతిజ్ఞ చేశారు. ఐఐటీ హైదరాబాద్ ప్రాంగణాన్ని పూర్తిస్థాయి మత్తు రహిత ప్రాంగణంగా తీర్చిదిద్దడానికి ప్రతి ఒక్కరూ కృషి చేస్తామని ప్రతిజ్ఞ చేశారు. ఐఐటీ హైదరాబాద్ డైరెక్టర్ బీఎస్ మూర్తి మాట్లాడుతూ.. మత్తు పదార్థాలు యువత భవిష్యత్తును, ఆరోగ్యాన్ని, కుటుంబాలను, సమాజాన్ని తీవ్రంగా దెబ్బతీస్తాయని, ఇలాంటి వాటికి దూరంగా ఉండాలని విద్యార్థులకు సూచించారు. ప్రగ్ ఫ్రీ ఇండియా ప్రతిజ్ఞ కార్యక్రమంలో

IT Hyderabad-Incubated PuREEnergy Draws Global Attention at Bharat Innovates 2026 in France

Nice (France)/SANGAREDDY, Correspondent :



IIT Hyderabad-incubated clean energy technology company PuREEnergy emerged as one of the standout Indian innovators at Bharat Innovates 2026 in Nice, France, attracting strong interest from global industry leaders, policymakers and investors for its indigenous sustainable energy storage solutions.

A key highlight of the event was the visit of Union Minister for Commerce and Industry Shri Piyush Goyal to the PuREEnergy pavilion. During his interaction with the company's Founder, Dr. Nishanth Dongari, the Minister expressed keen interest in the company's flagship PuREPower All-In-One Energy Storage Platform and its potential role in advancing India's clean energy transition and energy independence.

The discussions focused on the platform's ability to serve as a clean and silent alternative to diesel generators, replace conventional inverter and lead-acid battery systems, and accelerate solar energy adoption through advanced energy intelligence integrated with hybrid solar functionality.

Recognizing the importance of indigenous energy storage technologies for India's future energy needs, Shri Piyush Goyal invited the company's leadership team for further discussions in New Delhi. He also encouraged PuREEnergy to expand its global presence, particularly in European and African markets, and facilitated introductions with major European conglomerates for potential collaborations.

Founded on research and innovation originating from IIT Hyderabad, PuREEnergy has grown into an emerging player in India's energy storage and battery technology sector. The company develops advanced Battery Energy Storage Systems (BESS), lithium-ion battery solutions, power electronics and integrated energy management platforms for residential, commercial and industrial applications.

At Bharat Innovates 2026, PuREEnergy showcased its latest PuREPower platform, highlighting its ability to reduce dependence on diesel-based backup power systems and imported hybrid solar power conversion technologies. The innovation aligns closely with the national vision of Aatmanirbhar Bharat and strengthening domestic manufacturing capabilities.

Industry experts at the event emphasized the increasing importance of energy storage solutions as electricity becomes central to modern lifestyles, digital services, mobility and renewable energy adoption. PuREEnergy's solutions offer reliable backup power, intelligent energy management and seamless integration with renewable energy systems to meet evolving consumer needs.

Bharat Innovates 2026, organized as part of the India-France Year of Innovation, brought together leading Indian deep-tech startups, research institutions and technology companies to showcase innovations with global potential. PuREEnergy's strong presence and positive response at the event reflect the growing international recognition of India's clean energy innovation ecosystem.

మంగళవారం | 16| జూన్ | 2026

భారతీయ 5జీ శాటిలైట్ ఐఓటీ చిప్‌సెట్‌కు ప్రపంచ వేదికపై గుర్తింపు

వియాసాట్-సైగ్ నెట్‌వర్క్ సంయుక్త పరీక్షలు ప్రారంభం



సంగారెడ్డి ఆక్షిత బ్యూరో: భారతదేశంలో రూపొందించిన 3జీపీపీ రిలీజ్--17 ఎన్‌బీ--ఐఓటీ నాన్--టెరెస్ట్రియల్ నెట్‌వర్క్ (ఎన్‌టీఎన్) చిప్‌సెట్, శాటిలైట్ కమ్యూనికేషన్ రంగంలో అంతర్జాతీయ గుర్తింపు దిశగా మరో కీలక అడుగు వేసింది. ప్రపంచ ప్రఖ్యాత శాటిలైట్ కమ్యూనికేషన్ సంస్థ వియాసాట్, ఐఐటీ హైదరాబాద్ ఆధ్వర్యంలో ఏర్పడిన టీప్‌బిక్ సంస్థ సైగ్ నెట్‌వర్క్ సంయుక్తంగా ఈ చిప్‌సెట్, మాడ్యూల్ పరీక్షలను నిర్వహిస్తున్నాయి. ప్రస్తుతం యుసైటెక్ కింగ్‌డమ్‌లోని వియాసాట్ ప్రయోగశాలల్లో ఈ చిప్‌సెట్ పరీక్షలు కొనసాగుతున్నాయి. ప్రపంచవ్యాప్తంగా శాటిలైట్ ఆధారిత ఇంటర్నెట్ ఆఫ్ థింగ్స్ సేవలను విస్తరించడమే ఈ భాగస్వామ్య ప్రధాన లక్ష్యంగా పేర్కొన్నారు. ఈ చిప్‌సెట్ సముద్రంలో నౌకల వద్దకు వెళ్లే మత్స్యకారుల భద్రత, నౌకల పర్యవేక్షణ, వివిధ నిర్వహణ, దూర ప్రాంతాల్లో ప్రభుత్వ సేవలు, వ్యవసాయం, విద్యుత్, గనులు, ఇంధన రంగాల్లో ఆస్తుల పర్యవేక్షణ వంటి అనేక కీలక సేవలకు ఉపయోగపడనుంది. 3జీపీపీ రిలీజ్--17 ప్రమాణాలకు అనుగుణంగా రూపొందించిన ఈ సాంకేతిక ఎల్--బ్యాండ్, ఎస్--బ్యాండ్‌లలో పనిచేసే సామర్థ్యాన్ని కలిగి ఉంది. తక్కువ విద్యుత్ వినియోగంతో సంవత్సరాల పాటు పనిచేసే విధంగా దీన్ని అభివృద్ధి చేశారు. భవిష్యత్తులో 5జీ అడ్వాన్స్‌డ్, 6జీ శాటిలైట్ కమ్యూనికేషన్ వ్యవస్థలకు కూడా అనుకూలంగా ఉండేలా రూపకల్పన చేశారు. ఈ చిప్‌సెట్‌కు సంబంధించిన బేస్‌బ్యాండ్, ఆర్‌ఎఫ్ సిస్టమ్--ఆన్--చిప్, మాడ్యూల్, రిఫరెన్స్ పరికరాలన్నింటినీ సైగ్ నెట్‌వర్క్ అభివృద్ధి చేసింది. ఐఐటీ హైదరాబాద్ పరిశోధనల ఆధారంగా రూపొందుతున్న ఈ ప్రాజెక్టుకు కేంద్ర టెలికమ్యూనికేషన్ శాఖ, ఎలక్ట్రానిక్స్, సమాచార సాంకేతిక శాఖ, ఇండియా సెమీకండక్టర్ మిషన్ డిజైన్ లింక్డ్ ఇన్సెంటివ్ పథకాల నుంచి ఆర్థిక సహాయం లభించింది. భారతదేశంలో ముఖ్యంగా తీరప్రాంత మత్స్యకారుల భద్రత, వివిధ సమయంలో సమాచార వ్యవస్థలు, మారుమూల ప్రాంతాల్లో ప్రభుత్వ శాఖల కమ్యూనికేషన్ అవసరాలను తీర్చడంపై ఈ భాగస్వామ్యం ప్రత్యేక దృష్టి సారించింది. పరీక్షలు విజయవంతమైతే ప్రపంచవ్యాప్తంగా ఈ చిప్‌సెట్ అందుబాటులోకి తీసుకురావాలని సంస్థలు భావిస్తున్నాయి. ఈ సందర్భంగా వియాసాట్ ఇండియా మేనేజింగ్ డైరెక్టర్ గౌతమ్ శర్మ మాట్లాడుతూ, శాటిలైట్ ఆధారిత ఎన్‌టీఎన్ సాంకేతికత ద్వారా ప్రపంచవ్యాప్తంగా కోట్లాది పరికరాలను అనుసంధానం చేసే అవకాశాలు విస్మృతంగా ఉన్నాయని తెలిపారు. భారతీయ సాంకేతిక ప్రతిభతో కలిసి పనిచేయడం ద్వారా ప్రపంచ స్థాయి పరిష్కారాలను అందించగలమని చేర్కొన్నారు. సైగ్ నెట్‌వర్క్ వ్యవస్థాపకులు, ఐఐటీ హైదరాబాద్ అధ్యాపకులు ప్రొఫెసర్ కిరణ్ కుమార్ మాట్లాడుతూ, భారతదేశంలో అభివృద్ధి చేసిన కమ్యూనికేషన్ చిప్‌సెట్ ప్రపంచ అగ్రశ్రేణి శాటిలైట్ సంస్థతో పరీక్షల దశకు చేరుకోవడం దేశ టీప్‌బిక్ రంగానికి గర్వకారణమని అన్నారు. కేంద్ర ప్రభుత్వ సహకారంతో రూపొందిన ఈ సాంకేతిక భారత్‌తో పాటు ప్రపంచవ్యాప్తంగా వినియోగదారులకు ఉపయోగపడుతుందని ఆశాభావం వ్యక్తం చేశారు. ఈ ప్రకటన ఫ్రాన్స్‌లోని నీస్ నగరంలో జరుగుతున్న భారత్ ఇన్నోవేట్స్--2026 కార్యక్రమం సందర్భంగా వెలువడింది. భారత--ఫ్రాన్స్ ఆవిష్కరణల సంవత్సరంలో భాగంగా నిర్వహిస్తున్న ఈ కార్యక్రమంలో భారత టీప్‌బిక్ సామర్థ్యాలను ప్రపంచానికి పరిచయం చేస్తున్నారు.

ABN ఆంధ్రజ్యోతి

ఐఐటీహెచ్‌లో హాఫ్ మారథాన్!

● నవంబర్ 22న మెగా రన్

కంది, జూన్ 24 (ఆంధ్రజ్యోతి) : సంగారెడ్డి జిల్లా కంది పరిధిలోని ఇండియన్ ఇనిస్టిట్యూట్ ఆఫ్ టెక్నాలజీ హైదరాబాద్‌లో నవంబర్ 22న రన్నర్స్ హాఫ్ మారథాన్ 3వ ఎడిషన్‌ను నిర్వహించనున్నట్లు ఐఐటీహెచ్ అధికారులు తెలిపారు. ఈ మేరకు బుధవారం పోస్టర్‌ను ఆవిష్కురించారు. రన్.. ఇగ్నైట్.. ఇన్‌స్పైర్ (పరుగుతో ఉత్సాహం.. స్ఫూర్తి) నినాదంతో నిర్వహించే ఈ మెగా రన్‌కు ఏర్పాట్లు చేస్తున్నారు. ఈ రన్నర్స్ హాఫ్ మారథాన్‌లో పాల్గొనాలనుకునే వారు ఐఐటీహెచ్ వెబ్‌సైట్‌లో ఆన్‌లైన్ ద్వారా రిజిస్ట్రేషన్లు నమోదు చేసుకోవాలని ఐఐటీహెచ్ అధికారులు సూచించారు. 5కే రన్, 10కే రన్, 21కే మారథాన్‌లతో పాటు ఫన్‌రన్ ఈవెంట్లు ఉంటాయి. విజేతలకు ప్రశంసా పత్రాలతో పాటు, పతకాలు, బహుమతులు ఉంటాయి. ఇందులో పాల్గొనేవారు రిజిస్ట్రేషన్ సమయంలో 18 సంవత్సరాల వయస్సు కలిగి ఉండాలి. ఇందులో ఐఐటీహెచ్ విద్యార్థులు, అధ్యాపకులు, పూర్వ విద్యార్థులు మాత్రమే కాకుండా సాధారణ ప్రజలు కూడా పాల్గొనే అవకాశం కల్పించారు. ఈ కార్యక్రమం ఐఐటీహెచ్‌తోపాటు సంగారెడ్డి చుట్టుపక్కల పరిసర ప్రాంతాలలో శారీరక శ్రేయస్సును ప్రోత్సహించడంతో పాటు సమాజ భావాన్ని పెంపొందించడం లక్ష్యంగా పెట్టుకుంది. కాగా గత సంవత్సరం 2025 నవంబర్ 3న జరిగిన ఈవెంట్‌లో 5 కె, 10 కె, హాఫ్ మారథాన్ (21 కి.మీ) రేసులు జరిగాయి, దాదాపు 1500 మంది పాల్గొన్నారు. ఈ రన్నర్స్ హాఫ్ మారథాన్ అకాడమిక్ ఎక్సలెన్స్‌తో పాటు శారీరక ఆరోగ్యాన్ని మెరుగుపరుస్తుందని ఐఐటీహెచ్ డైరెక్టర్ బీఎస్ మూర్తి ఆకాంక్షించారు.

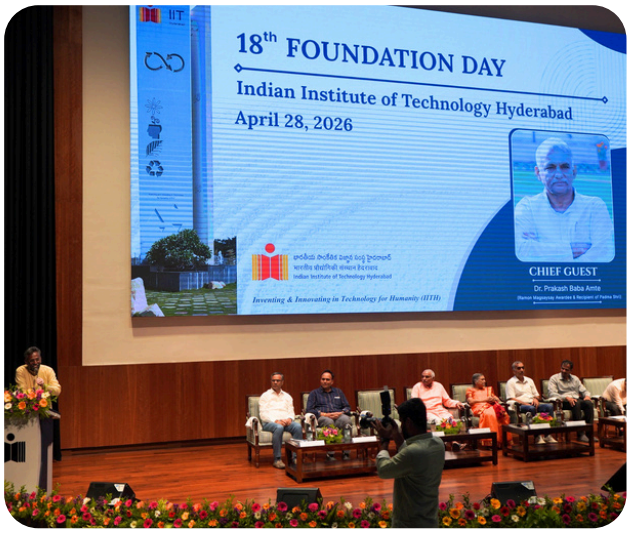


ఐఐటీహెచ్‌లో అధ్యాపకులతో కలిసి బుధవారం హాఫ్ మారథాన్ పోస్టర్‌ను ఆవిష్కరిస్తున్న డైరెక్టర్ బీఎస్ మూర్తి

IIT Hyderabad marks 18 years of excellence and innovation, celebrating its inspiring journey with Chief Guest Dr. Prakash Baba Amte











As part of the 18th Foundation Day Celebrations of IIT Hyderabad, Chief Guest Dr. Prakash Baba Amte planted a sapling, symbolizing the institute's commitment to sustainability and a greener future.







As part of the Foundation Day Celebrations, 218 students, staff, and faculty members were felicitated for their outstanding contributions towards the growth and success of IIT Hyderabad.













India's First Information Age Museum (IAM) launches IGNITE at IIT Hyderabad to Inspire Future Innovators







A new chapter in research and innovation begins at IIT Hyderabad with the groundbreaking of the COE-CLEANZ Building





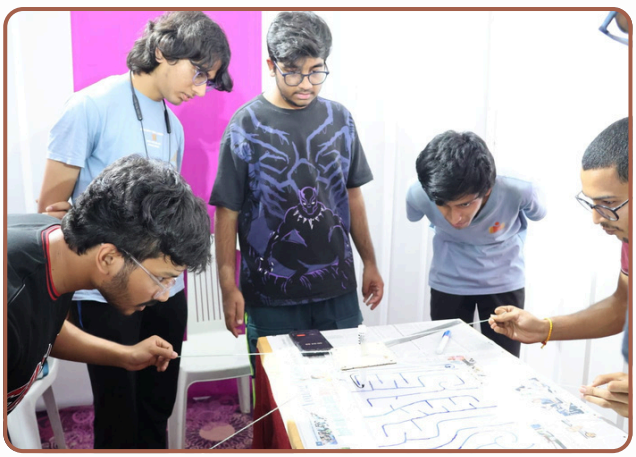
The Sunshine Happiness Carnival at IITH brought the campus together for an evening of creativity, joy, and community spirit, featuring the Pulse newsletter launch, Emosnap exhibition, live music, games, and food stalls.













IITH celebrated World Dance Day with Nritya Sandhya, showcasing diverse classical dance forms in a vibrant cultural evening.













Dept of Design successfully hosted the JEC lecture and interactive session with Prof. Kuroda Kazumitsu on Japanese Business Culture and Communication, enriching global industry insights.







IIT Hyderabad Climbs to Global Rank of 588 in QS World University Ranking 2027



IITH C15: CARBON Future Summit, celebrating 15 years of excellence and innovation by the CARBON Lab







Commemorating the 136th Birth Anniversary of B. R. Ambedkar, celebrating his enduring legacy of equality, justice, and empowerment.







IITH successfully celebrated World Bicycle Day with enthusiastic participation from over 200 cyclists, reinforcing its commitment to sustainable mobility and healthy living









The IITH Alumni Association Office inauguration at Technology Research park, IIT Hyderabad to strengthen alumni connections and engagement.







IIT Hyderabad organized its JEE Open Day for 2026 to help JEE Advanced qualifiers explore academic programs, placements, and campus life



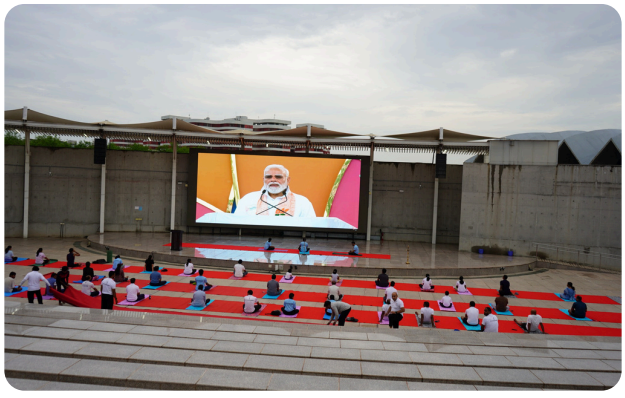




IIT Hyderabad celebrated the International Day of Yoga with active participation from students, faculty, and staff.









Under the Nasha Mukt Bharat campaign, a drug de-addiction pledge program was organized at IIT Hyderabad.





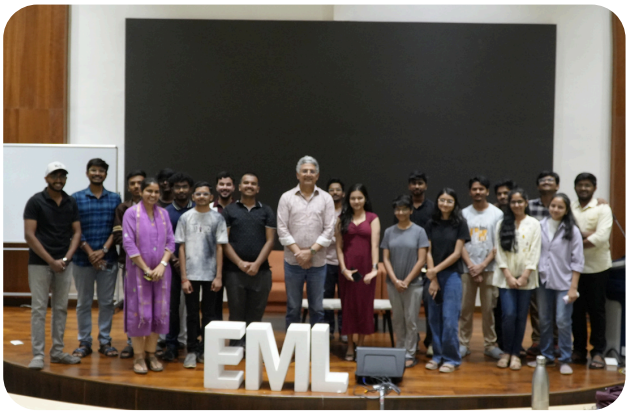
IIT Hyderabad observes International Day Against Drug Abuse and Illicit Trafficking through awareness campaigns and pledge programs under the national Nasha Mukt Bharat Abhiyaan



The 3rd Edition of the IIT Hyderabad Half Marathon 2026 is scheduled for November 22, 2026, on the IIT Hyderabad campus.



Ravi Sharma, Founder of the Institute of Goodness, delivered an Extra Mural Lecture on "The Goodness Index," redefining success and quality of life beyond conventional measures.





Entrepreneurship Talk by Dr. MSN Reddy on leadership, lessons, and the mindset behind exponential growth.



Curtain Raiser Event of PHOTONICS 2026 organised at IIT Hyderabad, the main event will showcase the future of photonics and optical sciences





The ANRF–IITH–ACS TAPAS Program at IITH successfully empowered researchers and faculty through interdisciplinary learning, innovation, and skill-building for the future of academia and industry





The Government of Telangana successfully organised the road safety awareness programme “Arrive Alive” at IIT Hyderabad





IIT Hyderabad proudly celebrated International Nurses Day and expresses gratitude to nurses for their selfless service to society.









IITH Successfully conducted Plantation Drives





Plantation Drive for the month of April



Plantation Drive for the month of May







Plantation Drive for the month of June

Prof U B Desai on
Rethinking Education in the Age of AI

https://youtu.be/4o8TG-l8UvE



India's Tech Future Dr. G. Satheesh Reddy

https://youtu.be/goNEFsix-9o



Dr. Prakash Baba Amte
The Inspiring Journey of Hemalkasa: Service, Humanity & Sacrifice

https://youtu.be/gdFvlZ6ZXQw



IITH successfully hosted the ACS Interactions webinar as part of Bact-O-Connect 3.0, exploring how to transform ideas into real-world impact.





IIT Hyderabad successfully concluded the ANRF-PAIR workshop on Artificial Intelligence in Healthcare, advancing collaboration and innovation in AI-driven solutions.

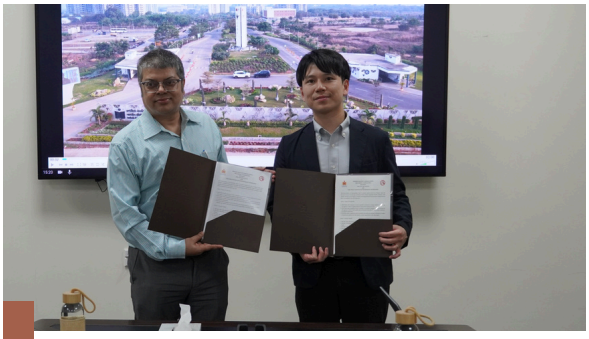


IITh successfully concluded the ANRF-PAIR Thematic Workshop on Energy, fostering dialogue on sustainable innovations and future energy solutions.





Dai Nippon Printing Co., Ltd. (DNP) inaugurates its first India R&D Centre at IITH, strengthening India–Japan innovation ties.



IITH and Nagoya City have signed an MoU, reinforcing collaboration alongside Nagoya University to foster innovation, research, and academic exchange.



IIT Hyderabad, DMRL and Innomet Join Hands for India's first Indigenous Large-Scale Gas Atomizer Development



AGC Asia Pacific India Establishes Innovation Hub at IITH to Strengthen Industry–Academia Collaboration in Digital Technologies



Centre for Development of Telematics (C-DOT) Signs MoU with IITH for Establishment of Centre of Excellence (CoE) in Advanced Communication Technologies



IITH and the Foundation for Indigenous Ecological Knowledge (FIEK) signed an MoU to promote Indigenous Knowledge Systems in agriculture, education, and sustainable rural development



TiHAN strengthens global collaborations to drive the future of autonomous and sustainable mobility



Viasat and WiSig Networks Collaborate to Test Made-in-India 5G NB-NTN Chipset for Global Satellite IoT Applications at Bharat Innovates 2026, France



Dr. G. Satheesh Reddy

Member of the National Security Advisory Board and former DRDO Chairman, Appointed as Honorary Advisor (R&D) to IIT Hyderabad.



Prof. Sushmee Badhulika

Department of Electrical Engineering

Elected as INSA Young Associate for 2026



Prof. Srikar AVR

Department of Design

Secured an international collaborative research grant for the project titled "Enhancing the Value of Hindu Cultural Capital in Ubon Ratchathani to Promote Faith-Based Tourism



Dr. Jyothi Vedurada

Department of Computer Science & Engineering

Recieved the prestigious HPE Dr. APJ Abdul Kalam HPC & AI Award 2026 under the category "Young Researcher – R&D in HPC Systems (Hardware & Software)"



Dr. Nithyanandan Kanagaraj

Department of Physics

on being elevated to
The Prestigious IEEE Senior Member



Dr Kaushal Kumar Maurya

PhD Scholar, Department of Computer Science & Engineering

Joined as an Assistant Professor, Department of Computer Science & Engineering, IIT Delhi – Abu Dhabi



Ms. Shraddha Namjoshi

Department of Physics

Selected the Health Behaviours International Collaborative Award 2026 Created by the International Behavioural Trials Network (IBTN) Awarded by the Society for Health Psychology (APA)



Mr Mohit Singh

Phd Scholar, Department of Civil Engineering

ReceivedThe Best Poster Award in the broad category at the PMRF symposium, which included (Civil, Earth science, Architecture, & Ocean Engineering)
Also received the Second-Best Presentation at the international conference- CARRS 2025

Faculty



Dr. Shibam Ghosh has been appointed as an Assistant Professor in the Department of Computer Science and Engineering at IIT Hyderabad. Prior to joining IITH, he was a postdoctoral fellow with the COSMIQ team at the French National Institute for Research in Digital Science and Technology (Inria Paris). He earned his B.Sc. from Krishnagar Government College (University of Kalyani), his M.Sc. from Presidency University, Kolkata, and his M.Tech. from the Indian Statistical Institute (ISI) Kolkata. Dr. Ghosh obtained his Ph.D. from the Department of Computer Science at the University of Haifa, Israel. His research interests lie in the fields of cryptography and computer security.

Dr Shibam Ghosh
Assistant Professor
Department of Computer Science and Engineering

Non-Teaching Staff



Ms. Moturi Lalitha holds a Post Basic B.Sc. in Nursing from ANRI College of Nursing, Visakhapatnam. She has over six years of professional experience as an Operation Theatre Staff Nurse, having worked at NRI Hospital and Apollo Hospital in Visakhapatnam.

Ms. Moturi Lalitha
Staff Nurse
Hospital

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భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
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Contact: +91 40-2301 6099, +91 83310 36099
E-Mail: office.pr@iith.ac.in

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