



IIT Palakkad

Technology IHub Foundation

EDUCATE . INNOVATE . IMPACT

Driving automation for energy and safety



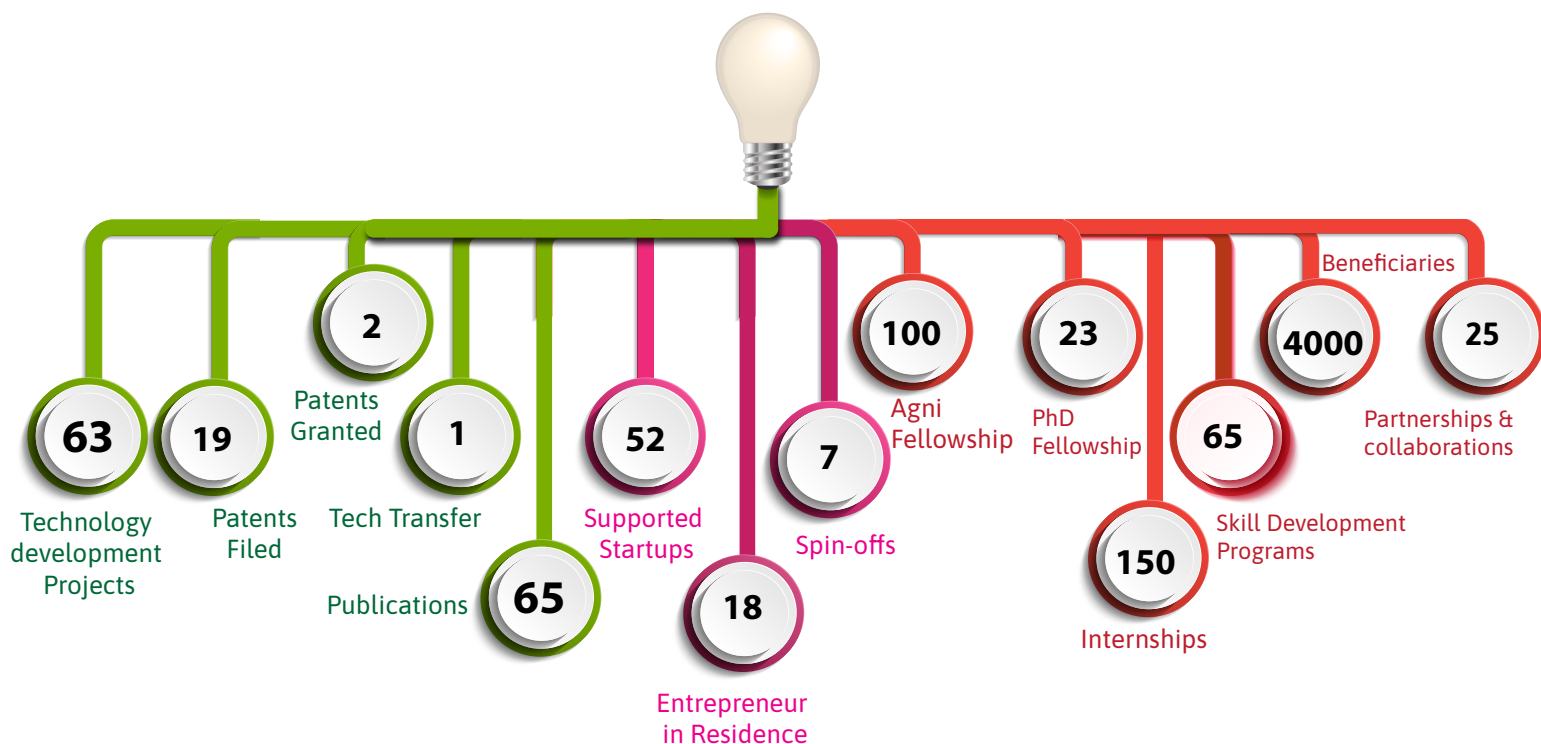
Kaleidoscope

Volume 4, Issue 2

As IPTIF enters its fifth year of successful operations, our commitment to advancing innovative technologies and products with meaningful societal impact remains strong. Over the past year, we've broadened our portfolio to encompass a greater number of technologies, startups, infrastructure, and programs. We've also made notable progress in skill development and established several valuable partnerships. With the continued support of our stakeholders, we are confident that IPTIF will be instrumental in cultivating a dynamic deep-tech innovation ecosystem in the region.

In this edition of Kaleidoscope, we're excited to share some of the key milestones and accomplishments since our last update.

IPTIF in a nutshell



IPTIF Foot Print



IPTIF New Facilities



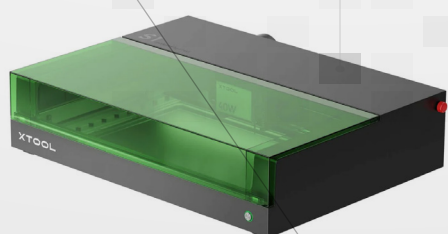
Neware Battery Test Systems



Bamboo Lab 3D printers
Multi Colour 3D printers



Neo Den PCB Pick & Place Machine and Reflow Machine



xTool S1 Enclosed Diode Laser Cutter
Table Top Laser Cutting Machine

Ansys



**Materialise
Magics**



**Altium
Designer.**

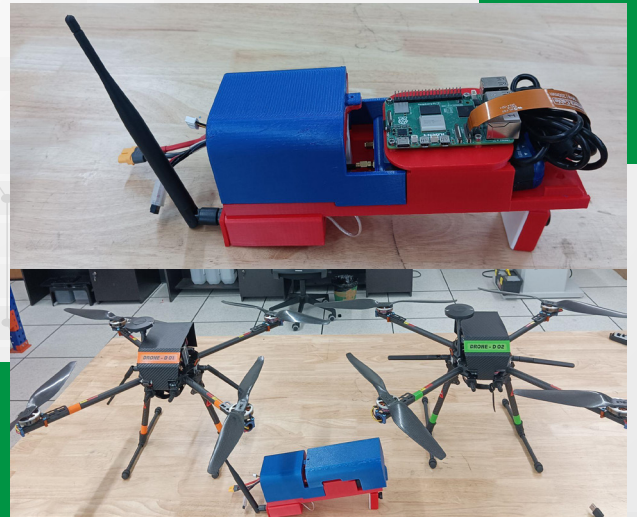
Software Suites



High Endurance Glider



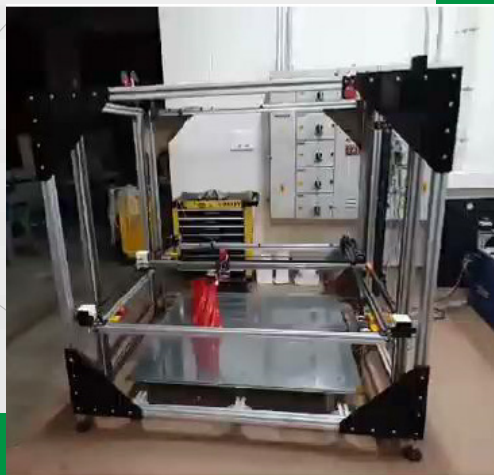
Automatic Vision Inspection System (AVIS)



Distributed Estimation & Controller



Integrated EV Power and Speed Measurement Device



Floor-Mount 3D Printer



Block Chain Powered Smart Energy Meter

Patent Filed

05

02

Patent Granted

An Adaptive Vibration
Control System



Shubhang Jain,
Lokesh Manangi Madhu,
Sanjukta Chakraborty.

Switched Reluctance Motor (SRM)
Arrangement With Sinusoidal
Inductance Profile



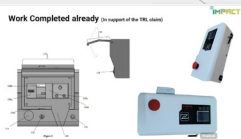
Vijay Muralidharan
Anirudh Guha
Rahul M S
Agney Marath
Bijin Balakrishnan
Aravind K Jayan

Demand Response Based Blockchain
Powered Electric Energy Meter
With Automated Load Control



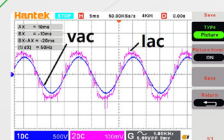
Dr. J. Jayakumar
Karunya Institute of
Technology And Science
& IPTIF

An Anti-Theft Smart Plug
Point System For Grid And A
Method Thereof



Nandhu Kiran
Fourth Dynamics
Pvt Ltd
& IPTIF

A Power Circuit To
Achieve Power
Factor Correction And
Method Thereof



Dr. S. Sankar
E-Drift Electric Pvt Ltd

Publications

- **Theoretical and experimental assessment of Maxwell-Boltzmann type gain distribution for the vibration control of a generalized structural system** - Srilatha Abhishek a , Deepthi Pilakkat a, Jagajyoti Panda b, Sanjukta Chakraborty - European Journal of Control -2025
- **A real-time hardware-in-the-loop system incorporating software defined radios for emulating multi-sensor networked control systems** - A. Rajagopal, S. Chitraganti - IEEE Explore-2025
- **Off-policy reinforcement learning for a robust optimal control problem with real parametric uncertainty** - A. Mullachery, S. Chitraganti - Conference - IEEE Explore-2024
- **Emulating networked control system with hardware-in-the-loop and software defined radios amidst channel uncertainties** - A. Rajagopal, S. Chitraganti - Conference - IEEE Explore-2024
- **Periodic Deterministic Sampling and Scheduling Algorithms for Minimum Age of Information in Time-Slotted Multihop Networks** - Nibin Raj, Vineeth B. S., and Pratik Sharma - IEEE Explore -2024
- **Design of Scheduling Policies for Minimizing Age of Incorrect Information in Multi-hop Wireless Networks** - Nibin Raj, Vineeth B. S - Conference - TechRxiv-2025
- **An Inductive Sensor System for Linear and Angular Displacement Measurement With Negligible Cross-Sensitivity** - Srikar Emany; A. S. Anil Kumar; Satyajit Das; Sreenath Vijayakumar - IEEE Transactions on Instrumentation and Measurement-2025
- **Integral Probability Metrics for Perceptual Learning in Generative Cross-Modal Person Re-Identification** - Nirmala Murali & Deepak Mishra - International Conference on Pattern Recognition-2024

Achievements



IPTIF-supported startup ARKLE Energy Solutions won First Place at the International Conference on Energy Conservation & Storage (IECS-2025), Madras Chapter.



IPTIF-supported startup ARKLE Energy Solutions was awarded second place in the Greenovation Energy Challenge - 2025.

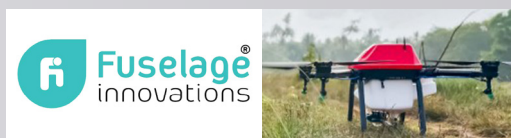


Mr. Sandeep Ture, Co-founder of Elexo Energy Pvt Ltd, Won the "Stanford Seed Spark 09 South Asia Cohort - Pitch Competition.

Medcuore Medical Solutions Pvt. Ltd was chosen as one of the top 10 startups for the "Techtonic 2024 - Innovations in Sustainable Urban Transition" initiative in collaboration with Social Alpha, U of T India Foundation.



Fuselage Innovations Pvt. Ltd. was shortlisted among the Top 11 startups for the prestigious Access Sharjah Challenge 2024.



IPTIF supported startup Warbler EV received a grant of INR 7 lakhs for battery technology from Kerala Startup Mission (KSUM).



Testimonials



Partnering with IPTIF at IIT Palakkad was a pivotal moment in our startup journey. The IMPACT Program provided us with crucial initial funding and expert training. Access to facilities like the Fab Lab, test benches, and co-working space accelerated our prototyping. IPTIF's internship program helped us build a passionate team. With consistent mentorship and strategic guidance, IPTIF truly fueled our growth.

Dr. Sankar S, Founder and Design Engineer
eDrift Electric Private Limited



We are immensely grateful to IIT Palakkad Technology IHub Foundation (IPTIF) for their unwavering support in developing our project, Blockchain Powered Smart Energy Meter. Their assistance—ranging from financial aid, technical mentorship, and access to testing facilities to patent support and industry linkages—was instrumental in transforming our idea into a robust prototype. IPTIF's ecosystem truly empowered us to pursue innovation aligned with India's vision for a smart and sustainable energy future.

Dr. J. Jayakumar, Professor, Karunya Institute of Technology and Sciences, Coimbatore



IPTIF's unwavering support turned my startup dream into reality. Their UYARE grant funded our honey-processing equipment, while the Entrepreneurship Development Course sharpened my pitch and business strategy. Networking events connected me with experts and tribal youth collaborators, and focused mentorship showed me how to scale sustainably. I'm truly grateful for IPTIF's pivotal role in my entrepreneurial journey.

Nikhil P S, Co Founder, Tribal Treasures Pvt Ltd



IPTIF has been a true partner in our journey at Elexo Energy — from early funding and mentoring to pilot projects, investor connects, and brand credibility. Their unwavering support has fueled our growth, and we're deeply grateful to the IPTIF team for believing in our vision and walking alongside us.

Sandeep Ture, Co-Founder, Elexo Energy Pvt Ltd



IMPACT 2.0

Innovation-to-Market Product Acceleration in
Cyber Physical Technologies



121

Total Applications

5

Selected Academic Spin-offs

18

Selected Startups

6 Cr

Total Funds Disbursed

Startups Onboarded Under IMPACT 2.0

Kabani Tech
#MakerSpace

HYETRON
ENERGY

Deepfleet

algōn

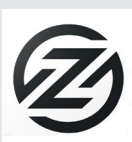
PRITVICHAKR
Innovations

SEAMOTO
ELECTRIC MARINE ENGINES

ELEXO
ENERGY

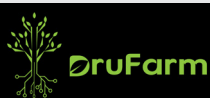
Dhanvantri Biomedical

AVRIS



TOMORO.TECH
Begins Here!

SAVTOA



BumbleBee
INSTRUMENTS PRIVATE LIMITED
An IIT Palakkad Incubated Company

ReHumus
Technology Pvt. Ltd.



Academic Spin-offs Supported Under IMPACT 2.0

**Motor Drives and
Modular Inverters**
Dr. Vijay Muralidharan,
IIT Palakkad

**Design and Development of
Solar Refrigeration
System for Rural India**
Dr. K. Ramachandra Sekhar
IIT Ropar

**Synthetic Digital Twin/Point
Cloud Generation,
Reconstruction and Structural
Health Monitoring.**
Dr. Ganesh Kolappan Geetha
IIT Bhilai

**Automatic Visual
Inspection System.**
Dr. Vivek Chaturvedi
IIT Palakkad

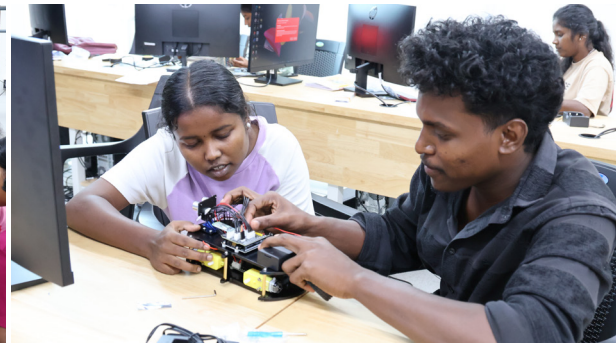
**Smart Energy Management
System for Hydrogen-Powered
Autonomous Vehicles**
Dr. G Y Rajaa Vikhram
SRM Institute



Unified Youth Advancement for Research & Entrepreneurship

IPTIF's UYARE is designed to empower students, startups, and academic innovators through focused technology development, entrepreneurship training, and skill-building initiatives. With a special emphasis on uplifting the Scheduled Tribes (ST) community, UYARE aims to build a more inclusive and dynamic innovation ecosystem.

Launched by Smt. M. Shameena, Tribal Development Officer, Palakkad in the esteemed presence of Prof A. Seshadri Sekhar, Director, IIT Palakkad. The launch event announced 20 students chosen for a 6-month in-house training and 13 technology development projects.



Technology Projects Selected Under UYARE

AI-Powered Smart Greenhouse Monitoring System
 Dr. Mehbob Ali, University of Ladakh, Ladakh



Heat Pipe-Assisted Solar Drying System

Dr. A. Asha Monicka, Karunya Institute of Technology and Sciences, Tamil Nadu



Engineering Porous Silicon Membranes for Water Desalination
 Dr. Revathy Padmanabhan, IIT Palakkad



Open Air Anode Reversible Hydrogen Fuel Cell
 Dr. Ravikumar, Atria University, Bangalore



Smart Signaling System for Passenger at Platform
 Mr. Gururaj Dangre, Pratibha Institute of Business Management, Pune



SMRTTI: Smart Regeneration of Tribal Industries.
 Mr. Nikhil P S, Tribal Treasures Pvt Ltd, Kerala



Enhancing Sustainable Bamboo Craft Production
 Mr. Suthagar Selvaraj
 Arola Bamboo Products Pvt Ltd, Tamil Nadu



Duocare – Transformative Prenatal Care Solution
 Dr. Tamilselvi, Zensit Smart Pvt Ltd, Tamil Nadu



CANORX Multipurpose Solar Electric Hybrid Tractor for Agriculture
 Mr. Ramu Banoth, Canorx Motors Pvt Ltd, Hyderabad



AI Autofocusing Microscope for Rapid Disease Diagnosis in Remote Areas

Dr. Earu Banoth, NIT Rourkerla



Smart Vision for Visually Impaired Tribal

Dr. D. Sivaraj, PSG College Of Technology, Tamil Nadu



Porous Silicon-Based Electrochemical ELISA Sensor for Brain and Kidney Injury Biomarkers

Dr Abdul Rasheed P, IIT Palakkad



Bio-Based Clay Emulsions for Sustainable Agriculture in Tribal Gujarat

Dr. Sumit Tripathi, Institute of Infrastructure, Technology Research and Management (IITRAM) Ahmedabad, Gujarat



Training Programs Under UYARE



In collaboration with Kaidoko Pvt. Ltd. a workshop focused on Robotics, AI & ML was conducted at ICFAI University, Shillong Law College and Lady Keane College, Meghalaya during 22–26 March 2025.

150 students gained hands-on experience.



IPTIF supported 09 students under SC/ST Category to participate in the International Learner's Summit organised by Indian Society for Training and Development in collaboration with CUSAT during 20-21st February 2025.

Expert Speaks



Mr. S Muralidharan

Chairman Mobility After Market &
Chief Mentor, Entrepreneurship
Development Program, IPTIF

Grooming Deep-Tech Startups

Deep tech startups refers to companies that focus on developing innovative technologies that have the potential to disrupt or transform industries. It is here that a subtle but significant difference with normal tech start ups have to be made ! These startups involve building products and services that are based on scientific discoveries , new discoveries ,or emerging technologies. In India the examples of these could be in AI, blockchain, quantum computing, biotechnology, nanotechnology. It is true that what is today deeptech can become just tech in a few years !

As of 2024, India is home to over 3,600 deep tech startups, with 480 new startups established every year, nearly doubling the number since 2022. It is guesstimated that these startups have raised over \$10 billion in the last 5 years, including global funding.

But the journey for such startup founders are not easy. The jump from a research project or a technical paper to applying that technology as an enterprise needs many new learnings and adjustments. There is also often a confusion that should they become a hardware deep tech or stick to software; should they be vertical-specific or socially-relevant. or both?

Typically two gates need to be crossed in this journey.

Gate 1- Reach a product-market fit based on a clear customer discovery.

Gate 2- Develop a clear business model and business plan to reach acceleration.

In the absence of clearly defining and crossing these gates, startups will flounder for years and sometimes simply fail. It is in such transformation of deep tech ideas and concepts to successful startups, that IITs can play a major role. Very few acceleration centers exist for such deeptech startups. Very few courses or specialised business coaching are given, in fact most of them are merged with normal "tech startup" courses ! In this context, IIT-Palakkad with TECHIN and IPTIF supporting startups in various forms have taken the first concrete steps.

IPTIF focusses more on Hardware/Deeptech leading to applications which are relevant to society. Entrepreneurship Development Courses (EDC) upto product-market mix, demo days, master classes have been done to groom startups upto a level. A few startups like Elexo, Warbler, Arkle, e-Drift, Meducore have already made an impact. Academic spin-offs from IPTIF supported translational R&D projects at IIT Palakkad, also deserve a special mention. TECHIN too has made its mark via center of competence for sanitation, women entrepreneurs programmes and created some high performing startups like NIRGANDH, Happy 60+ etc. But IPTIF can do a lot more, particularly in accelerating these startups by developing a robust business model and a business plan.

I expect IITs to lead the way in this by a combination of careful selection, clear acceleration programmes, support funding ways and make these startups society-relevant. In the long run a research park which creates a synergy with IPTIF and TECHIN becomes relevant.

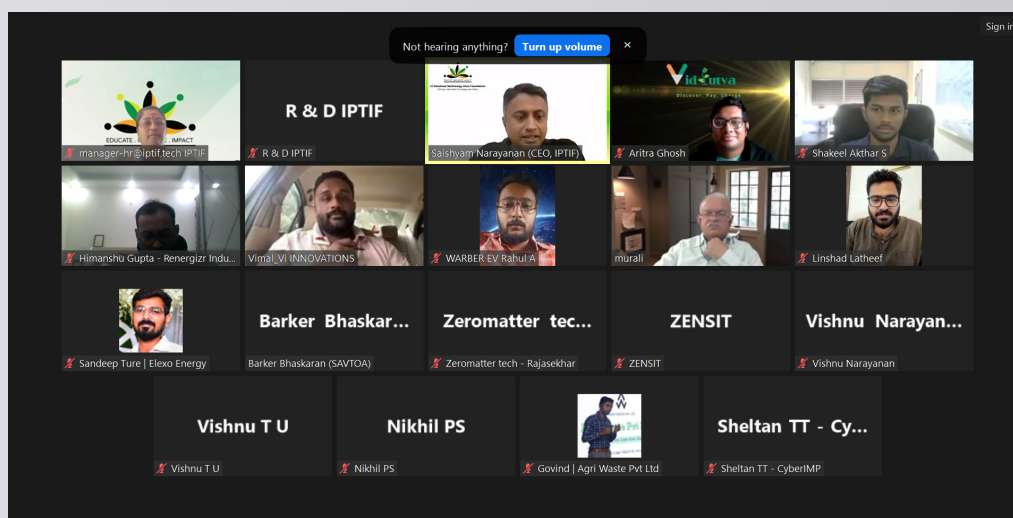
Looking forward to this exciting journey.



IPTIF IMPACT Demo Day

A 6-month course led by Mr. S. Muralidharan concluded with IPTIF IMPACT Demo Day on 5th Dec 2024, showcasing innovative startups from IPTIF and TECHIN to Angel Investors.

Prof. A. Seshadri Sekhar, Director, IIT Palakkad presented awards to the best pitch, best impactful startup and the most popular startup as part of the demo day.



Entrepreneurship Development Course (EDC)
Cohort 2 launched with 15 startup founders.

TIPS 5.0 at IISc, Bangalore



Pan IIT World of Technology (PIWOT 2025) at Mumbai



IIT Palakkad Open house



TECHIN & IPTIF - IIT Palakkad



InvenTiv 2025 at IIT Madras

Huddle Global 2024 at Trivandrum



Bioconnect 2.0 at Trivandrum



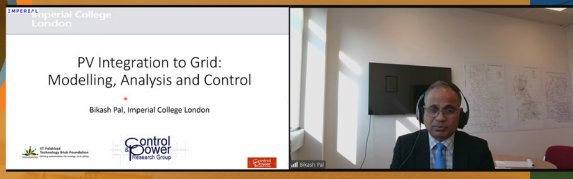
18th Pravasi Bharatiya Divas at Bhubaneswar



Tech Connect 2.0 at IIT Palakkad



IPTIF's Advanced-Level Short-Term Online Course on PV Integration to Grid: Modelling, Analysis, and Control



A Short term course conducted on “PV Integration to Grid” focused on modelling, analysis, and control, from 18–22 Feb 2025, led by Prof. Bikash Pal (FIEEE), Imperial College London. 57 global participants from academia and industry joined the sessions



A 3-day hands on workshop on “Advanced Power Electronics Design” from 24th to 26th October 2024 led by Dr. Vijay Muralidharan, Assistant Professor, IIT Palakkad and Dr. Sankar from eDrift Electric Pvt Ltd, 12 students participated.



A two-day workshop on Power System Protection on PSCAD, conducted on 30th November and 2nd December 2024 led by Dr. Manas Kumar Jena, Assistant Professor, IIT Palakkad



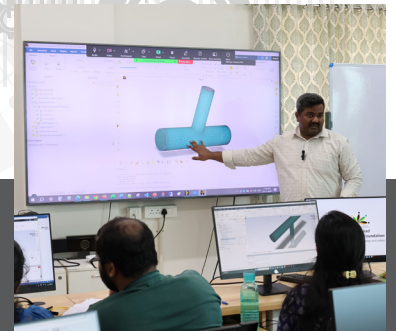
Mr. Lomin Joy, Senior Project Engineer at IIT Palakkad, led multiple training programs including a Bootcamp on Programming and Machine Learning, an internship on Edge Computing, and a workshop on Data Analytics, collectively benefiting over 80 students from SAFI Institute, PMA SAFI HR Institute, and College of Engineering Thalassery.



A one day workshop on “3D printing design” at IPTIF skill development center on 24th January 2025. Ten students from the NSS College of Engineering, Palakkad participated.



Workshop on “Materialise Magics: 3D Print Data Preparation” conducted on 9th & 10th Dec 2024 led by Mr. Ajmal, Skill Development Manager, IPTIF and Mr. Amit Mishra, Sales Application Engineer.

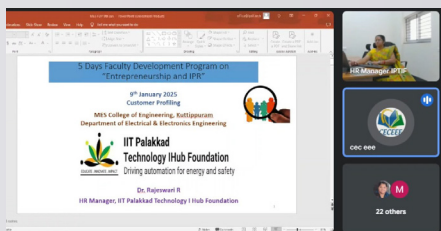


The new facility was incorporated by conducting a Two-day ANSYS workshop during 13th and 14th of November 2024 by the IPTIF team. 30 participants attended the workshop.

HR Activities

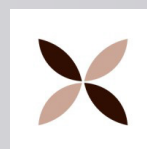


An awareness program on "Empowering Safe work place: Promoting Awareness and Prevention of Sexual Harassment" organized by Internal Compliance Committee (ICC) under POSH of IPTIF on 30th December 2024 led by Adv P Prem Nath.



Faculty Development Program on "Engineering Entrepreneurship and IPR" at MES College of Engineering, Kuttippuram on 9th January 2025. Session led by Dr. Rajeswari R, HR Manager, IPTIF. 35 participants attended the program.

Collaborations



Visitors



IPTIF is honoured to have Prof. Anurag Kumar, Former Director of IISc and Shri Ananth Krishnan, Former CTO of Tata Consultancy Services as our reviewers for DST NM-ICPS during November



Mr. Amitosh G and Mr. Ajith Gerald from World Resource Institute exploring the possibilities for collaborative research



Mr. Tirumala Gudla Mentor, IIT Startups visited IPTIF to join IMPACT Demo Day.



Mr. Suresh Kodoor, Director - Academia Industry, A partnership from Amrita University visited IPTIF to join IMPACT Demo Day startup pitch.



Prof. Ibrahim Hafeezur Rehman, Director, School of Sustainability and Mr. Arunkumar Pillai, Director-General (NAMTECH) visited IPTIF.



ICICI Foundation CSR team visited IPTIF to discuss collaboration



Mr. Naveen Jha, Global Director at Mehta Family Foundation and Mittal Institute Fellow visited IPTIF



Prof. Seshadhri Srinivasan, C-RACE, Kalasalingam Academy of Research and Education and Prof. Omkumar Krishnan, Professor, Marketing Management, IIM Kozhikode visited along with Prof. Vijendran Venkoparao as part of a collaborative project.

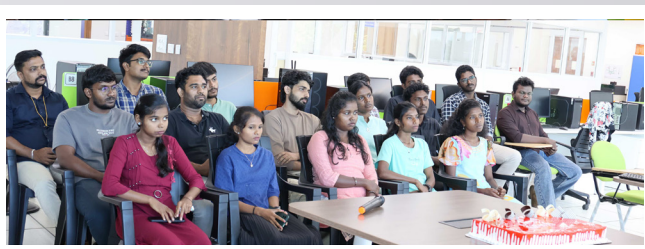


Mr. S R Nair Entrepreneur, Author & Former Visiting Professor, IIM Kozhikode visited IPTIF.



Prof. B. Venkatachalapathy, the Vice-Chancellor of Karpagam Academy of Higher Education

IPTIF MOMENTS



IPTIF Christmas Celebration 2024



IPTIF Supported startup e-Drift Electric Pvt Ltd Graduation Ceremony



Upcoming



Green Hydrogen & Associated Technology Systems

GHATS 2025

4th - 6th June 2025

REGISTER NOW

<https://iptif.accubate.app/ext/form/3409/1/apply>



A Workshop on Hydrogen Energy Systems

Join us for an in-depth 3-day workshop on Hydrogen Energy Systems, featuring expert-led sessions and networking opportunities with industry leaders!

Key Highlights

- Electrolyzers & Fuel Cells – Fundamentals, scale-up challenges, and troubleshooting.
- Hydrogen Storage & Supply Chain – Latest innovations and practical methods.
- Green Hydrogen & Policy Aspects – Exploring economic and regulatory frameworks.
- Industry Talks & Networking – Engage with professionals.

Who Should Attend?

Industry Professionals | Researchers & Faculty | Startups | Students

Registration Fees

Industry: ₹15,000 | Startups: 10,000 | Faculty: ₹5,000 & Students with Poster: ₹2,500



Showcase your research!
Abstracts invited for Posters & Flash Talk.

Last Date to Register & Submit Abstract
15th May 2025

For more details: office@iptif.tech | Venue: Hotel Distrikt 9, Kanjikode, Palakkad, Kerala

REGISTER NOW