Visit to IIT Madras Research Park Chennai

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Abstract

In April 2024, I visited IIT Madras Research Park (IITMRP) which is one of its kind industry-academia establishments spread over 1.2 million square feet of area in an 11-acre campus. There are over 70 R&D tie-ups with the industry, which has incubated over 200 start-ups and has 1300+ patents to its credit. I had the chance to visit the various facilities and companies which are based out of IIT Madras Research Park and experience the cutting edge work that is being done. I am deeply grateful to Professor Ashok Jhunjhunwala, President of IITMRP for spending time with me and introducing me to his wonderful team which facilitated the meetings with start-ups.

My report here covers five of the most impressive companies/bays that I spent time with.

Table Of Contents

1. Centre for Battery Engineering and Electric Vehicles (C-BEEV)

Centre for Battery Engineering And Electric Vehicles (C-BEEV) was set up in 2016 at IIT Madras to path-breaking research and development in the field of Electric Mobility in India, in collaboration with major OEMs. It has the following three centres:

1) Centre for Battery Engineering (CoBE)
2) Centre for Electric Vehicles (CoEV)
3) Centre for Decentralised Power System (CDPS).

Its products include the following:

1) Li-ion Batteries with in-built thermal management system
2) Permanent Magnet Synchronous Motor (PMSM) with Controller
3) Electric Vehicles
4) BLDC Motor Controllers

It is working hard to align with the Government of India's vision of a cleaner and greener future in Electric Vehicle Infrastructure and policies like FAME II. Focus Areas of CoBE are Performance analysis and testing, battery designing and optimization (Price–Performance), battery management systems, thermal control systems, control and protection mechanisms, mechanical management, development and analysis of secondary use, battery swapping, battery recycling, understanding safety, training and building knowledge among a large number of people. Some of the startups housed in C-BEEV are Ozone Motors Pvt. Ltd., PiBeam Labs Pvt. Ltd., Esmito Solutions Pvt. Ltd. and Flowtrik Technologies Pvt. Ltd.

Centre for Battery Engineering and Electric Vehicles

Picture 1: Entrance to the CBEEV at IIT Madras Research Park

2. Agnikul Cosmos Private Limited

An Indian Aerospace Manufacturer based in National Centre for Combustion Research and Development (NCCRD) of IIT Madras Chennai. The Company was incorporated in 2017 and got incubated at IIT Madras at 2018. It aims to provide affordable and efficient launch services for small satellites weighing between 1 to 100 kgs into Low Earth Orbit. Their flagship product is Agnibaan rocket, a 3D-printed single-piece launch vehicle designed for easy Assembly and launch. Agnikul has received funding from various investors, including the Indian Government's Department of Space and has partnered with organisations like ISRO and DRDO. Recently the company has raised US$26.7 million in a Series B funding round bringing the total capital raised to US$40 million. The company debuted with its first launch in May 2024 with Agnibaan. They now plan to work towards perfecting the technology of firing several engines simultaneously and conducting experiments for stage separation. https://www.business-standard.com/companies/start-ups/space-startup-agnikul-cosmos-creates-history-by-launching-agnibaan-rocket-124053000472_1.html

Agnikul Cosmos Pvt. Limited

Picture 2: Reception area of Agnikul

Note: Photography is not allowed beyond this point

3. Healthcare Technology Innovation Centre (HTIC)

Healthcare Technology Innovation Centre (HTIC) is a multi-disciplinary R&D Centre, a joint initiative of IIT Madras and the Department of Biotechnology (DBT), Government of India, that brings together technologists, engineers, doctors and healthcare professionals to develop healthcare technologies for the country. HTIC IIT Madras provides infrastructure, funding, and mentorship support to researchers, students and start-ups working on innovative healthcare projects. The centre aims to address unmet healthcare needs in India and improve healthcare outcomes through technology innovation. The focus is entirely on indigenous research and development in advanced technologies including cardio-vascular screening, rapid blood test kits for communicable diseases developed in association with Jmitra, a mobile eye surgery unit developed with Sankara Nethralaya, eye screening devices, neonatal incubator, endoscopy systems. The primary objectives of HTIC IIT Madras are:

- To foster innovation in healthcare technology
- To develop affordable and accessible healthcare solutions
- To promote entrepreneurship and start-ups in healthcare technology
- To collaborate with industry, academia, and government agencies

Healthcare Technology Innovation Centre

Picture 3: Visitor reception area of HTIC

Healthcare Technology Innovation Centre

Picture 4: Display of research areas in HTIC

Healthcare Technology Innovation Centre

Picture 5: Me inside the HTIC display zone where they explained each of the devices through actual models

4. Triolt Energy Private Limited, IIT Madras Campus

Triolt Energy Pvt. Ltd. is a pioneering start-up dedicated to indigenous development and manufacturing of Lithium-ion battery (LIB) cells in India. Produces batteries that reduce charging time and enhance the lifespan of battery cells. Recognizing these aspects as critical for the mass adoption of electric vehicles (EVs), the company has developed LIB cells capable of charging to 90% in just 15 minutes, with a cycle life exceeding 2000 charges, compatible with India's tropical climate, elevated temperatures, etc. The company works with a relentless focus on delivering cutting-edge solutions for clean energy storage, Triolt Energy is poised to play a transformative role in shaping the future of sustainable transportation and energy consumption in India and beyond.

Inside the Triolt Energy Private Limited Lab

Picture 6: With the founding team of Triolt Energy Private Limited

5. Solinas Integrity Private Limited

Solinas Integrity Private Limited (SIPL) is a recognized deep tech and climate tech start-up incorporated in December 2015 that develops robotic and AI-based technologies for the pipeline and sanitation industry. The company is dedicated to addressing challenges in society such as water contamination, leakages, blockages and problems related to manual scavenging.

The Company employs an inspection robot named Endobot which includes a range of robots. These are pipeline crawlers that can inspect underground pipelines to identify leaks, contamination, and other critical defects. Endobots offer live visual inspection and instant leakage and blockage detection. Endobots operate as a service-based business model.

The company has also developed a septic tank & manhole cleaning robot HomoSEP, to replace manual scavenging. HomoSEP is equipped with a patented multiple-blade cutter that can mix the deepest and hardest sludge at the bottom, and a suction pump that can store and transfer the sludge through a pipe into a tank. The company thus partners with city corporations and helps manual scavengers learn new skills to operate these machines, reducing their direct contact with sewage. The flagship solution HomeSep, India's first septic tank and manhole cleaning robot offers an end-to-end solution that eliminates manual scavenging.

Picture 7: Entrance of Solinas Integrity Pvt. Limited at IIT Madras Research Park

6. Incubation Centre

This centre provides space and infrastructure to start-ups in their early stages. Several startups like Ather, Uniphore, Stellaps and Hyperverge have either turned into unicorns and/or successful businesses.

Picture 8: Me at the Incubation Centre with a display of successful startups that were incubated here at IITMRP

7. Experience Centre at the Incubation Centre

Picture 9: Experiencing Skilling through a VR headset at Skillveri

Conclusion

IIT Madras Research Park is a unique Public-Private enterprise, which is leading the way in industry-academia partnership. The incubation facilities are world class and it is no wonder that so many successful technology startups made it their first home.

India has over 110,000 startups and attracts proportionate funding from high-quality venture capital across the world. IIMRP is a shining beacon of India's young technology prowess.

On the other hand IIT Madras is the top ranked engineering school in India and amongst the top 25 in the world. It was my good fortune to be able to spend time and learn from the brightest minds that India has to offer.

I do hope to continue engaging with the startups at IITMRP.

References

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