



R&D Newsletter

INDIAN INSTITUTE OF TECHNOLOGY KANPUR



Innovation Ecosystem



Open house on Innovation Ecosystem

An Open house on Innovation Eco-System was held on Saturday, 18th of April, 2015. It was an important event considering that the stakeholders related to technology development, patenting, and entrepreneurship were present on a single platform. Professor K. Muralidhar, Dean of Research and Development welcomed the audience, while Director, Professor Indranil Manna and Deputy Director Professor A.K. Chaturvedi presided over the event. Dr. B.V. Phani, Associate Dean, Innovation and Incubation and Professor Siddhartha Panda, Associate Dean, Industrial Collaboration conducted the proceedings.

The session provided an in-depth view of what IIT Kanpur has to offer to budding technologists and entrepreneurs. Be it the Motwani Incubator and Accelerator, Tinkering Lab, RuTag, 4I Lab, Bio Incubator, IP creation and management, or the MoLE Incubator, each one of them has played a crucial role in asserting our identity as a technology institution. These activities are coordinated by the SIDBI Innovation and Incubation Center (SIIC) under whose aegis the open house event was conducted. Short write-ups on these initiatives are contained in this newsletter.

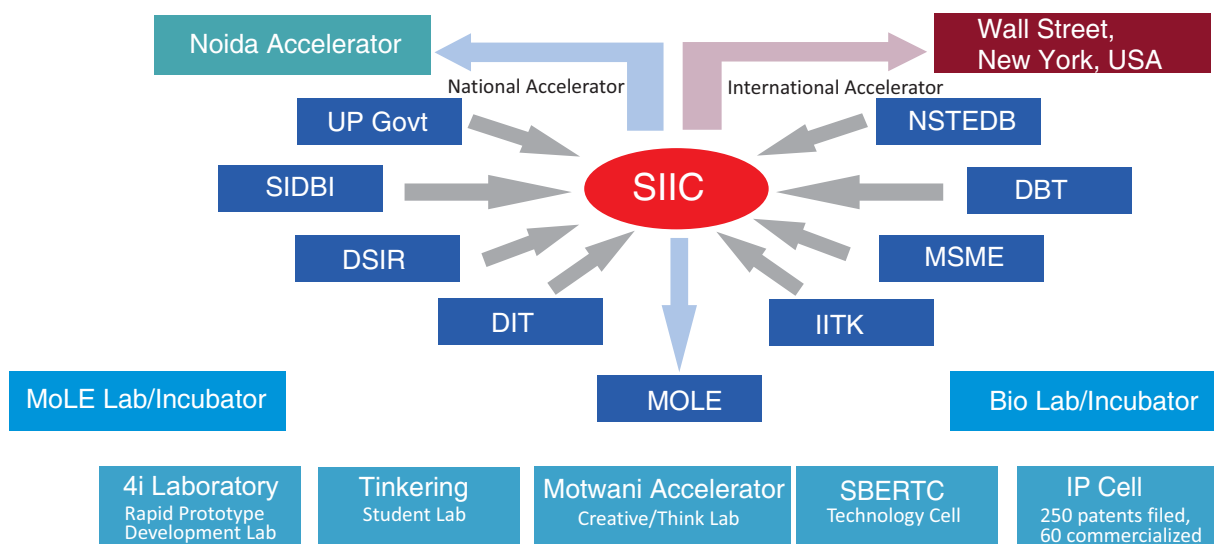
During the year, 56 patents have been filed which include 3 international patents. 8 patents were granted in the year, 20 technologies were licensed for commercialization. The earning from intellectual property is well over US \$49000. As of date, the institute has filed 294 Patents of which 41 are international, 10 are design patents, 40 patents were granted. Over 40 technologies have been licensed for commercialization. A total of 21 companies are currently incubated at SIDBI Innovation and Incubation Centre (SIIC) and 31 have graduated till date.

One of the targets of creating an integrated and networked ecosystem is to provide students an opportunity to ideate and test new devices and stir their imagination. Apart from this new structure, a major highlight of the event was a discussion on student-entrepreneurship policy and the possibility of a Deferred Placement Programme (DPP). In a closing statement, the Director lauded the efforts of the stakeholders and assured full support to take the proposals to the next level.



Innovation Ecosystem

The Innovation Ecosystem at IIT Kanpur is a unique experimental and incubation space fostering innovation and entrepreneurship in the whole country. The ecosystem is driven by a set of laboratories and testing facilities encompassing the entire gamut of engineering disciplines from Bio-Engineering, Mechanical, Electronics and Electrical to IT & ITES and is open to anyone with an innovative idea. These facilities provide the students, innovators and entrepreneurs both within the institute and outside a unique environment to fructify their ideas into viable high technology intensive products thus helping them in building a successful entrepreneurial venture with minimum cost. SIIC along with the Innovation Council is at the epicentre of this ecosystem fostering, facilitating and funding these nascent entrepreneurial ventures. IIT Kanpur faculties play an important role in this ecosystem in providing knowledge and technical expertise as mentors to make them globally competitive. A graphic representation of this ecosystem is provided below.



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MOLE Incubator

The Innovation Eco system at IIT Kanpur has Incubation Centers in diverse domain areas. The MoLE Incubation Centre is the newest addition to the existing Innovation Eco System. It is being set up at IIT Kanpur in the area of Power Generation, Distribution, Transmission, Wiring and Electrical Equipment with funding from the Ministry of Labour and Employment (MoLE). The laboratory set up under this project is open to all and focuses mainly on attracting the grass root innovators from the technical Institutes in the region. Such Innovators would use the lab setup for the purpose of experimentation, skill development and setting up their own venture in this domain area using the existing incubation facilities at IIT Kanpur subject to the terms and conditions laid down in the Incubation Policy of the institute. Maximum 30 number of such Incubate Companies would be allowed Incubation at any point of time with the Incubation period of one year. The Incubation period is split into three months of skill development and selection process and 9 months of Incubation at the Centre. The Incubation period may be extended by one more year subject to a meeting of the performance metrics laid down by the Centre, availability of Incubation space and approval for extension from the Director.

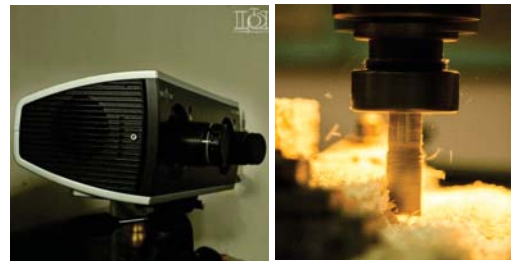
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Tinkering Laboratory

Tinkering laboratory started in late 2012. The lab has been funded by the generous contributions of alumni of '86 batch, '76 Batch and DST (via the Multi-disciplinary Innovation Laboratory Initiative). It is a platform for the student community of IIT Kanpur, incubating companies, entrepreneurs, to involve in hands-on activity in mechanical/electrical/electronics elements fabrication processes. It has enabled the users to build large engineering devices, develop complex systems and represent IIT Kanpur at various national and international competitions. It is operated by the Student Gymkhana. The idea is that students 'operate' on their own, under supervision. This facility is extensively used by the students of Robotics club, Aeromodelling club, Electronics club of the institute and Society of Automotive Engineers chapter of IIT Kanpur. Several student projects and national and international project competitions have been accomplished in the facility. Few patents have also been filed. Tinkering lab witnesses 18-20 footfalls per day with students from different departments and programs. It greatly helps the cause that the laboratory is open beyond the working hours.

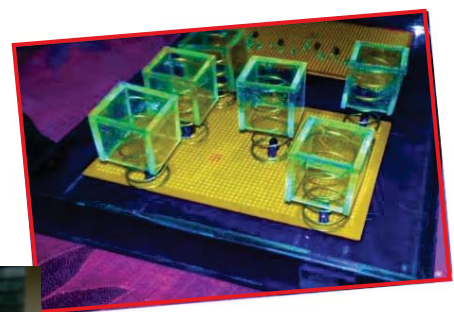
Facilities available

- Basic lathe machines
- 3-D scanner
- Basic milling machines
- Bench drilling machine
- Vacuum plastic forming machine
- Sheet metal cutting and bending machine
- Shearing machine, small grinders, buffing tools,
- Hand grinders and drill machines
- Bench vices for metal fitting and wood work activities
- Spray painting, all fitting and carpentry tools
- Marking and measurement tools
- Air-compressors
- Welding machine



Chess Playing Robot

Glimpses of Some Major Project



Analog Keyboard



All Terrain Vehicle

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4i Laboratory

The 4i Laboratory was incepted in the year 2003 for providing manufacturing support to UG and PG activities across the institute and also to help to incubate new companies at IITKanpur. The current motivation for the 4i laboratory is to provide innovative technical solutions to industry and institute, to provide technical support for student and research projects and to help in developing hands on innovative curriculum for the various specialized PG courses. The laboratory houses around 21 machining centers which are mainly classified as CNC centers, non-traditional machining centers, PCB fabrication line and associated equipment, conventional machining centers etc. The various mandates of 4i laboratory are detailed category-wise in the following sections.

Support to the Undergraduate Activities: The 4i offers machining support to the various undergraduate student clubs and their activities. These mainly include Robocon, Abhyast and SAE.

Support to Postgraduate Activities: 4i also offers support for post graduate level innovative projects of the institute such as fabrication of an Unmanned arial vehicle (UAV), Microfabrication of channels for various microfluidic applications, fabrication of high aspect ratio structures using alternate machining methods, laser based scribbling of plastic components for various sensing applications, design of various microdevices etc. It also plays a pivotal role in developing innovative curriculum which is used for various PG courses across the institute and also for the prestigious VLFM course.

Support to industry and various collaborations: The 4i promotes collaborative activities across institutes like PUJ Columbia, IIT Kanpur, Stanford collaboration for design program and offers various solutions to IIT Kanpur incubated companies and also on a miniscule basis to some external industries. There is a tremendous increase in the visibility of 4i laboratory due to its participation in the above modes as various platforms of the institute. The 4i lab is committed to facilitate the process of promoting research and innovation at IIT Kanpur in the years to come.



E-Cell IIT Kanpur

While 'Entrepreneurship' is growing to be one of the business world's biggest buzz words, the E-Cell at IIT Kanpur envisions a time, when youth will look up to the new generation of CEOs and entrepreneurs as their modern day rock stars. Motivated by this vision, E-Cell is working to induce an entrepreneurial mind set into the students and to air an innovative streak in them. One of the objectives of this cell is to support the aspiring entrepreneurs of the future and also to drive-in the real sense of 'entrepreneurship' in those, who are new to this entrancing word. The cell strives to reach out to the 'junta' and convey the idea of entrepreneurship which applies as much in politics, religion, society and the arts, as it does in business. It is working towards building an inspired GenNext who has the inbuilt urge to innovate, take risks, shoulder social responsibility and indulge in the creative execution of their vibrant ideas.

E cell conducts several events such as talks, competitions, workshops and brainstorming sessions to boost up the entrepreneurial environment in the campus. A three-day Entrepreneurship Summit 'E-Summit 2014' comprised talks by eminent personalities, workshops and competitions, was organized from 22nd to 24th August, 2014. E-cell also organized TEDx IITKanpur which is an independently organized TED event under the motto 'Ideas Worth Spreading'.

This cell connects students to VCs, mentors, industrialists as and when required to help them grow their start-ups. It has a Start-up Internship Program (SIP) which strives for developing an entrepreneurial streak among campus students by helping them acquire an internship in the most spirited and exciting start-ups of our country. 'Start-up 101' is a student driven entrepreneurial lecture series, where students come together to share knowledge, conduct lecture on technological and business awareness. Students get easy access to the various facilities like MIA (Motwani Ideation Accelerator), SIDBI Innovation and Incubation Centre (SIIC), Tinkering Lab and 4i Lab via E-cell.

E-cell has generated the concept of campus entrepreneurs. Campus Entrepreneurs are a group of students in the campus who have either extensively worked with start-ups or have started one. E-Cell with their support organizes 'entrepreneurial hangouts'. These hangouts are group discussions organized every Sunday, aimed at discussing the opportunities and challenges in a sector or the journey of a start-up.

Promote, Research, Innovation, Mentoring and Entrepreneurship (PRIME'83) is an initiative by '83 batch with a purpose of creating successful tech-entrepreneurs. The SIIC IIT Kanpur, the Office of Dean of Resource Planning and Generation, the Office of Research and Development, IIT Kanpur have come together to facilitate this initiative.

Since the inception of E-Cell IIT Kanpur, there have been several start-ups on the campus and the numbers are growing rapidly; and these startups are now trying to make a mark globally!

E-Spin Nanotech pvt. Ltd

E-Spin Nanotech Pvt. Ltd. is a high-tech enterprise focusing on fabrication, research and development of customized lab and industrial scale electro-spinning units for the production of nanofibers. Founded by Dr. Sandip Patil in 2010 under the guidance of Prof. Ashutosh Sharma, Department of Chemical Engineering at IIT Kanpur and later stage financially supported by SIDBI Innovation & Incubation Centre (SIIC) incubation facilities at IIT Kanpur, the company has transformed ideas into reality within a span of five years. In short duration of five years, The company has made its footprints in the market worldwide and has its esteemed customers in India, USA, Europe and the Middle East. Nonetheless, It is also developing the novel material market by providing low cost, state of the art electrospinning machine for nanofiber production that will emerge as a novel tool in industrial research and its commercialization. The vision of this company is to become a leading global company in the manufacture of high end electro-spinning unit for the lab & industrial scale research. The aim is to enhance the value of our customer and provide world class services. E-Spin believes that the products that they make should have a significant positive environment, social and economic impacts through sustainable development. It focuses on nurturing innovation, learning through diversity and team work amongst employees and believes on 'Innovation', 'Initiative' and 'Implementation'.



Nanofibers Membranes



Syringe Pump



Electrospinning Machine

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InvivoD Solutions pvt. Ltd

InvivoD is a start-up under the aegis of faculty entrepreneurship program of IIT Kanpur and an off-shoot of research carried out in the laboratory of its co-founder (Prof. Pradip Sinha). InvivoD provides a proprietary technology platform for anti-cancer drug screen wherein cancers, induced by well-defined genetic manipulations in the fruit fly, *Drosophila*, mimic the pathogenesis of human epithelial carcinomas, neuroblastomas, and blood cell carcinomas. Further, these *Drosophila* cancers respond to anti-cancer drug treatments. InvivoD provides such *Drosophila* cancers models—customized for the specific needs of the biopharmaceutical industry—as a pre-clinical in vivo test platform for anti-cancer drug screen.

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Aarav Unmanned Systems pvt. ltd

Founded in September 2013, Aarav Unmanned Systems (AUS) is a startup, developing cutting edge technology in the field of Unmanned Aerial Systems (UAS). Incubated and funded by IIT Kanpur's SIDBI innovation and incubation facility, AUS has successfully ventured into civil, research and defense application capabilities using short range Unmanned Aerial Vehicles. AUS boasts of having its roots built around a very young, passionate and dynamic team of diverse backgrounds. Unmanned Aerial Systems developed by AUS can be deployed into applications like GIS mapping and surveying, 3D modelling, precision agriculture, institutional research, general industrial inspection, thermal inspection, aerial photography, disaster management, event management, homeland security and defense surveillance. AUS is also involved in R&D of control systems, sensors and other hardware and software systems. AUS provides technological solutions and alternatives to a wide variety of sectors using Unmanned Aerial Vehicles. It caters to requirements, problems and ineffective traditional practices by designing most advanced drones and customizing them with respect to different sectors.

Product Developed

- ▲ Multirotor SUAS autopilot
- ▲ Fixed wing type SUAS autopilot
- ▲ Nayan - Mini Quad-rotor platform for vision aided navigation and control algorithm R&D
- ▲ Drishti - Short range, medium endurance quad-rotor for mapping and surveillance



Nayan



Drishti

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