



## Dear Reader,

Greetings from the Gopalakrishnan-Deshpande Centre for Innovation & Entrepreneurship (GDC), IIT Madras. . Our Newsletter, I-NFORM, is aimed at keeping you informed about all the developments in GDC around the university innovation and entrepreneurship ecosystem in India. I-NFORM will keep you updated on the events at GDC during the most recent quarter, about our upcoming programs, charting the exciting journeys of early-stage startups, and insights from leaders and policymakers in India's translational research and startup ecosystem.

Despite the Covid-19 pandemic, 2021 has been a busy year at GDC. In early September, we completed Cohort 16 of our flagship I-NCUBATE program. About the same time, we also completed Cohort 8 of the I-NSPIRE program, which we had conducted for NIRMAAN, the student-focused pre-incubator of IIT Madras.

As our online programs of I-NCUBATE and I-NSPIRE stabilized over the past year, we decided to renew our digital presence by launching a new website: [www.gdciitm.org](http://www.gdciitm.org). We welcome you to visit our website. GDC anchored a panel discussion at the 10th Annual Deshpande Symposium which was conducted online in June 2021. Our panel ([view a recording](#)) made a distinct impression on a global audience on the theme "Emerging Role of Academicians & Researchers in the Indian Startup Ecosystem".

We look forward to your support and collaboration as we move forward in our journey of strengthening the Indian university ecosystem for innovation and entrepreneurship. We hope you enjoy reading about our activities in this first edition of I-NFORM.

Sincerely  
Team GDC

## Highlights of I-NCUBATE Cohort 15 FINALE

The Cohort 15 of GDC's I-NCUBATE program ended with a grand online FINALE on July 3, 2021, where participants shared their learnings during the program with guests including industry leaders, policymakers, academicians, and investors. The Chief Guest for the FINALE was Mr. Anil Agarwal, Additional Secretary, DPIIT, Ministry of Commerce, Government of India. Mr. Agarwal also heads the StartUp India initiative, which has played a stellar role in spearheading the growth of the startup ecosystem in India. I-NCUBATE is an 8-week long boot camp conducted by GDC for early-stage startups emanating from university labs, with a focus on building an entrepreneurial mindset amongst faculty and researchers who are seeking to commercialize their scientific research.

Seven teams from four academic institutions – comprising nine faculty leads and 25 entrepreneur leads – participated in Cohort 15. The teams were working on deep technology innovations ranging from Safe Water Technology to indigenously made Smart Sensors. Speaking at the event, R. Raghuttama Rao, CEO of GDC, explained the organization's mission. "While a good measure of applied/transformational research happens in India, it does not come out of labs in institutions to solve real-world problems as much as it must do," said Mr. Rao. "As a result, India relies on technology imported from the West. These technologies are not available to a large section of our society. Therefore, it is imperative for our educational institutions to step up to this challenge. That is where GDC comes in."

Addressing the gathering subsequently, Chief Guest of the event, Mr. Anil Agarwal, said the Union Government, through the Startup India initiative, will explore the possibilities of partnering with academic institutions to give an impetus to the innovation ecosystem in the country.



Mr. Agarwal said that when the Union Government launched the Startup India initiative in 2016, not many people understood the true meaning of the word startup. "Now, in 2021, there are 58 Unicorns in India, according a recent report. Of them, 16 attained that status just this year. Startup India has recognized 50,000 start-ups since 2016, of which 10,000 came in the past 180 days. This is the current innovation landscape of our country," said Mr. Agarwal.

*A start-up is not just an idea that you developed further in your lab. A start-up must be an incorporated company. In India today, the number of jobs generated per start-up is 11. Which means, close to 5.5 lakh jobs have been created in the start-up ecosystem.*

**Anil Agarwal, Additional Secretary, DPIIT**

"In plain terms, a startup is about making money out of a technology or innovation at hand. However, in academia, we have a fundamental attitude problem. We focus only on problem-solving. The journey of an entrepreneur, in reality, begins after finding a solution to solve the problem."

Speaking on the need for stronger academia-industry-investor relations, Mr. Agarwal said, “There is a need to bridge the gaps in that ecosystem, and GDC is doing exactly that. I would like to take this initiative to a national level. We need to think about how we can do this program in a larger way, involving more institutions, with government support, and producing quantifiable and tangible results.”

“We need to explore how we can get investments in deep-technology in India. Many entrepreneurs from India go abroad to build their companies. The main objective of Startup India mission is to provide such entrepreneurs sufficient facilities to do the same in India. In this context, we must look at ways to mobilize domestic capital.”



*Before 2010, there was hardly any entrepreneurial thought process at IIT Madras. Today, we believe we are the nation’s leading ecosystem, with 250 deep-tech startups to our credit, with a market valuation over Rs. 10,000 crore*

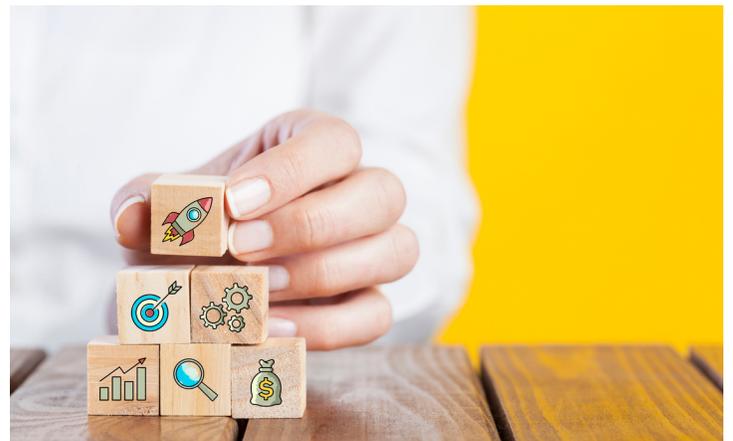
**Prof. Krishnan Balasubramanian,  
Professor in-charge, GDC, IIT Madras**

<b>Impact Story</b>	<b>900</b>	<b>198</b>	<b>₹425 mn</b>
	participants have attended GDC programs	startup teams have been trained in customer discovery	raised by 40 startups that undertook I-NCUBATE

## Meet our startups from Cohort 15

### TEAM CHEM BIO SENS

This team has developed a Multi-WAP platform for a multiplexed, label-free, rapid and real time monitoring of multiple pathogens present in water and food. Their solution has a high sensitivity level (>90%) and extremely low cost. The team feels that the platform will be extremely useful for environmental monitoring and food safety testing. In India, where water-borne diarrhea kills more children than AIDS, malaria, and measles combined, such an instant testing system could be life-saving.

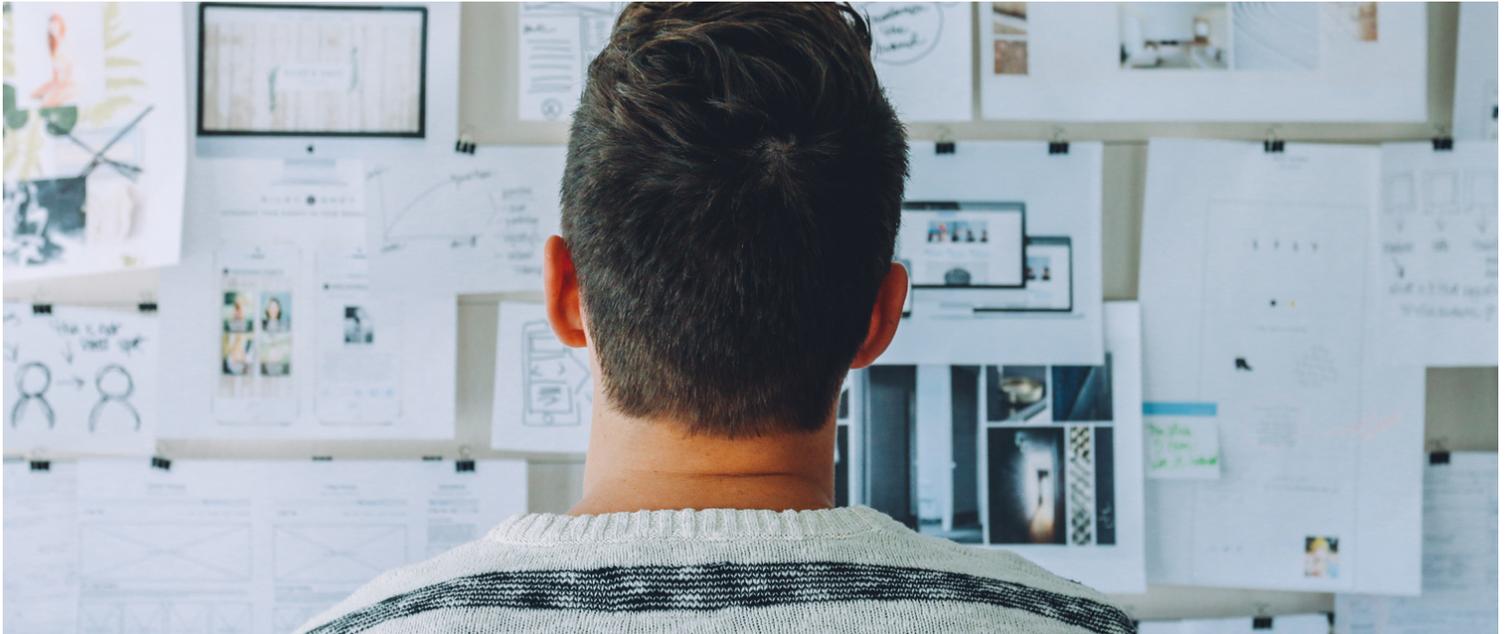


## TEAM PRAGYAN

In a sector completely dominated by international brands, team Pragyan's vision is to provide indigenously developed, affordable solutions and equipment for materials characterization. They feel that their solution can be a game changer in accelerating research at various academic and CSIR research labs in the country.

## TEAM MML

Worried about food adulteration? Team MML has developed a game-changing point-of-use, 3D paper-based microfluidic device that can detect multiple adulterants in one go. The solution can detect adulterants such as urea, detergent, soap, salt, H<sub>2</sub>O<sub>2</sub>, boric acid and neutralizers in liquid food in a single test at extremely low cost.



## TEAM AZERIRI

Azeriri brings together a huge pool of scientific and domain expertise in electronics design and manufacturing to produce sensors for end-user applications in emerging futuristic areas like intelligent automation, augmented reality, agritech & industrial IoT.

## TEAM X-PIX

Team X-Pix has developed a 'fold\_5' optically coupled X-Ray detector. This is a multimodal imaging detector that can do radiography, CT scan, fluoroscopy & XEOL imaging in a single equipment. This is a game changer for researchers, as it makes available innovative imaging technologies to visualize samples on multiple characteristics with different imaging modalities.

## TEAM VPE

Nearly half of India's population faces extreme water stress, says government data. Team VPE aims find a solution to this crisis by providing desalinated drinking water produced without the use of electricity. They are working on water desalination technology using wave energy in coastal areas.

## TEAM aiMAT

aiMAT aims to accelerate the development of materials like steel, high performance alloys, ceramics, composites, building materials, polymers, catalysis, etc. and also make the manufacturing process less energy intensive. Their solutions will find end-use application in aerospace, defense, consumer electronics, ion-batteries, semiconductors & energy.

## IIT Delhi Director shares his startup journey at Cohort 16 FINALE

“Unfortunately, there was no GDC when I began my startup journey,” said Professor V. Ramgopal Rao, Director, IIT Delhi. “I learnt to be an entrepreneur the hard way – through trial and error. What should have taken me a mere 2-3 years took twice the time to complete.” Prof. Rao was speaking at the online FINALE of I-NCUBATE Cohort 16 of GDC on September 4, 2021. I-NCUBATE is an 8-week long boot camp conducted by GDC for early-stage startups emanating from university labs.

The I-NCUBATE program is designed to build capabilities and develop an entrepreneurial mindset in the faculty and researchers who wish to commercialize their scientific research and take it to the market. Eight start-up teams comprising 30 entrepreneur leads and 10 faculty leads from 10 educational institutions, one corporate company, and one incubator participated in the program.



Speaking at the event, Prof. Rao narrated his own entrepreneurial journey while building NanoSniff – a deep-tech startup that built the world’s first microsensor-based explosives detector. He stressed on the need for commercialization of university research to boost indigenous inventions, as nobody else can be motivated to solve India’s problems.

“India stands third in university research, after the US and China. Our research output has grown tremendously over the past several years. We have also become the best optimizers, producing the highest number of research papers per dollar spent,” he said. “However, the translation of that knowledge into wealth is not happening. That is where we are lacking as a country. At some point, we need to start thinking beyond just publishing papers.” Prof. Rao urged scholars to step out of libraries and classrooms to identify pertinent research problems.

*In our current context, over 70% of research problems are picked from libraries. Instead, students and research scholars must try to address real-life social problems through their research. Only then can we develop indigenous solutions to our local challenges*

***Prof. Ramgopal Rao, Director, IIT Delhi***

“India has all the problems in the world. If you want to find a research problem, you just have to step out of your classroom... into the street. I pity students who go to the library to select a research problem. We should be going out, into the society.”

Prof. Rao said the research problems that he aims to address with his innovations were all picked from the society, and not from the library. “It helps when you can connect with people from various walks of life.” Speaking about SoilSens, another innovation and startup in which he was involved, Prof. Rao said that connecting with farmers helped his team build the device that aids in precision farming.

“In our current context, over 70% of research problems are identified from libraries. There is a need to change that,” added Prof. Rao.

## Meet our startups from Cohort 16

### TEAM BITNUT

Fishermen at sea are often the ones to bear the brunt of cyclonic activity. This is what prompted Team Bitnut to develop a mobile-based, plug-and-play, private radio system that is cheaper than VHF sets and has a better reach than normal cellphones. While joining the I-NCUBATE program, they were of the idea that all fishermen were their potential customers. Today, after making some critical discoveries, they have decided to focus on their early adopter segment.

### TEAM SPONGE

When there is severe bleeding after an accident or during a surgery, medical experts use hemostats to control blood loss. Team Sponge has developed a hemostat sponge that can absorb 30% more blood, thereby increasing the odds of survival for patients in trauma. Through the I-NCUBATE program, this team identified those who are likely to buy their product, and who would be their beneficiaries.



### TEAM MICOLORS

Industrial effluents polluting rivers and waterbodies is what prompted Team MiColors to develop fungal pigments. They believe their innovation will have widespread usage possibilities in textiles, food processing, and cosmetics industries. After coming to GDC, the team has decided to focus first on one segment.

### TEAM A-SENSOR

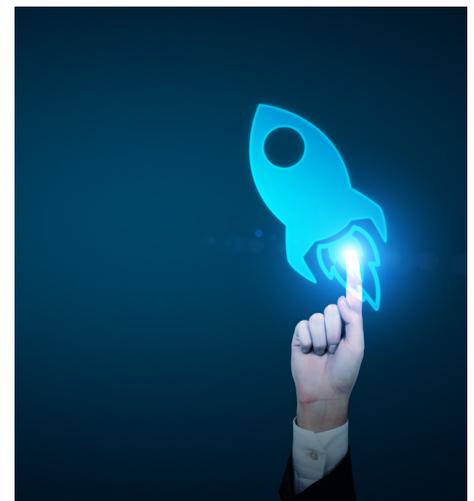
Sensors have widespread applications across industries. Team A-Sensor has used the technology to build a wearable, non-invasive, diabetes-monitoring device. As the market for wearable diabetes monitoring devices is heating up, Team A-Sensor might become a crucial player in it.

### TEAM YUSHU EXCELLENCE

Team Yushu Excellence set out to build a personal medical records application. In I-NCUBATE, as part of the customer discovery process, the Team found out that there already are multiple apps in the market, and most of them have a low rate of adoption. Now, the Team is focussing on a different segment.

### TEAM AGROBIOCNG

This team is about the right innovation at the right time. When the cost of LPG is on a perpetual upward spiral, Team Agro BioCNG has come up with an eco-friendly cooking alternative – compressed biomethane. The product, made from agricultural and industrial waste, could replace LPG cylinders in kitchens of restaurants.



## TEAM I TORQUE

At a time when professional cycling brands are launching their products in India, Team iTorque has developed a stepless gear transmission technology. The Team wants to utilize the technology in both gear bicycle manufacturing and in mopeds & scooters which use the auto-transmission technology.

## TEAM SMART WINDOW

Smart glass with switchable transparency has widespread applications in transport, commercial constructions, and healthcare infrastructure sectors. However, expensive technology had restricted the market adoption so far. Team Smart Window believes its new technology will bring down the cost.

## GDC at 10th Annual Deshpande Symposium

The 10th Annual Deshpande Symposium was held as an online event in June this year. GDC conducted a panel discussion at the event, on the 'Emerging role of academicians and researchers in the Indian startup ecosystem'. The panel comprised distinguished academicians from across India - Prof. Ravinder David Koilpillai from IIT Madras, Prof. J. Ramkumar from IIT Kanpur, Dr. Manish Arora from Indian Institute of Science, Bengaluru, and Ms. Poyini Bhatt, CEO of Society for Innovation & Entrepreneurship (SINE) at IIT Bombay. The discussion was moderated by R. Raghuttama Rao, CEO, GDC.

Opening the discussion, Mr. Rao explained that the purpose of GDC was to replicate in India the impact that National Science Foundation's Innovation Corps had in the US. "We help early-stage entrepreneurs avoid the 'valley of death in innovation'. Over the past three years, we have gathered evidence of how our programs are helping academicians and researchers think differently. Through the I-NCUBATE program, we have been able to help entrepreneurs reduce their odds of failure."



*Speaking on the startup ecosystem in India, Mr. Rao said that according to government data, India is emerging as the third largest startup ecosystem in the world. "However, our labs – both national R&D and university facilities – are not well connected to the startup ecosystem. Our R&D spend has stagnated for the past few years at 0.7% of GDP, much lower than the R&D spends in US, China, and Korea." On the other hand, Mr. Rao added, "India has a large educational infrastructure – with over 12,000 science colleges and 4,000+ engineering colleges. The problem is that only a few of these colleges have put in place a systematic process to commercialize research by bringing it to the market."*

“In absence of this, Indian products are dependent on technology developed in the West, where the per capita income is over \$40,000. In India, over 65% people have annual income of less than \$1,000. This implies that a large section of Indians does not benefit from the expensive technological solutions of the West. Therefore, it’s imperative for India to solve its challenges – from climate change to public health – through local innovations. To bridge this gap, India is coming up with new public policies, and is planning to boost R&D investments,” said Mr. Rao.

Speaking on the change witnessed in the research environment in India, Prof. David recalled how the Indian Institutes of Technology (IITs) have reinvented themselves from being predominantly undergraduate teaching institutions to research-centric ones. “IIT Madras, for instance, has more postgraduate students than undergrads. We are also seeing a substantial growth in funding levels in India. Last year, the Electrical and Electronic Engineering Department received 33 funded-research proposals with a total value of \$8 million,” he said. “Finally, the most crucial change is in the confidence level in students and scholars, in taking up challenges in globally competitive research topics.”



*Prof. Ramkumar spoke about his transformation, from predominantly publishing papers to filing patents to building products. “While I was working on my papers, I realized that patents are the future. When I was working on my patents, I thought the end result will be directly absorbed by corporate companies. Later, I understood that these patents are not directly ‘digestible’. So, I had to understand what companies want and fine-tune my products or patents,” he said.*

Bringing his startup to the I-NCUBATE program was a transformational experience for Prof. Ramkumar. “It was eye-opening... I started understanding market needs or industrial requirements. After that, in the past three years, I commercialized four of my products. It took a mindset change to move from research to commercialization,” Prof. Ramkumar added.

Ms. Poyni explained the advantages academic incubators have over private ones. “There is a whole gamut of research history at universities, an R&D base, apart from access to human resources from undergraduate students to research scholars,” she said. “Infrastructure such as laboratories is also available in incubators based in academic institutions. The milieu of an academic incubator, hence, is very different from a private one.”

Dr. Manish Arora stressed on the importance of social impact for innovations to crystallize into a product. “It’s challenging to focus on both research and the need to commercialize research. It’s important to understand that social impact is a key factor. At GDC, we were able to realize that the real world requirements are very different from the lab environment. Once we meet customers, we are able to develop a product that will benefit the society. Going through the GDC program reinforced these understandings.”

## About I-NCUBATE

I-NCUBATE is a bootcamp for early-stage start-up teams, to enable lab-to-market transformation of research ideas into deep-tech startups that create positive social and economic impact at scale. I-NCUBATE aims to change the culture of innovation at academic or research institutions.

## Announcements

**6th October 2021:** I-NCUBATE Cohort 18 application deadline

**13th November 2021:** I-NCUBATE Cohort 18 begins

**8th January 2022:** I-NCUBATE Cohort 18 FINALE



Thank  
you

## Contact Us

*If you have any queries, reach out to us at [enquiries@gdciitm.org](mailto:enquiries@gdciitm.org)  
To stay updated about GDC's programs and events, visit: [www.gdciitm.org](http://www.gdciitm.org)  
Follow us on social media: <https://www.linkedin.com/company/gdciitm/>*