

# Monthly Coverage Dossier August 2017



## IIT-M start-up bags \$1 million order from Singapore firm

To Transfer Tech For Virtual Ops

By Rishi Kulkarni, A start-up from IIT Madras has bagged a \$1 million order from Singapore firm to transfer technology for virtual operations.

### LAB WORKING ON TOUCH SENSE

TouchLab at Applied Mechanics Department of IIT Madras is the first and unique lab in India working in touch sense (touch lab).

**First Products** include:

- **Virtual Reality (VR) Headset** - Developed by IIT Madras research team.
- **TouchLab** - A platform for developing touch-based applications.
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Researcher — has been working on touch sense technology for the last few years. He has been working on touch sense technology for the last few years. He has been working on touch sense technology for the last few years.

## IIT Madras Tops in Industrial Consultancy Projects

In 2015-16, IIT Madras had 737 projects and received ₹63.15 crore through earnings

**Researcher** — The Indian Institute of Technology Madras has topped the list of top 100 industrial consultancy projects in India for the year 2015-16.

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## Data science & AI lab set up at IIT-M

MoU Signed Between IIT-M & RBEI

**Researcher** — The Indian Institute of Technology Madras and the Robert Bosch Engineering and Business School (RBEI) have signed a Memorandum of Understanding (MoU) to set up a Data Science and Artificial Intelligence (DS&AI) lab at IIT Madras.

The lab will focus on research in data science and artificial intelligence. The lab will focus on research in data science and artificial intelligence. The lab will focus on research in data science and artificial intelligence.

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Prepared by



**IIT Madras is a campus of choice for  
high ranking JEE students**

Date: 1st August 2017

Publication: India Education Diary

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT Madras welcomes new students with state-of-the-art infrastructure and new initiatives**

URL: <https://indiaeducationdiary.in/iit-madras-welcomes-new-students-state-art-infrastructure-new-initiatives/>

### **IIT Madras welcomes new students with state-of-the-art infrastructure and new initiatives**



Chennai: Indian Institute of Technology Madras welcomes the newly admitted students, with state-of-the-art infrastructure and several new initiatives intended to give them a top-notch experience in one of the most prestigious academic institutions in the world. The new academic session of the Institute for the B.Tech, B.Tech-M.Tech (dual Degree) and MA students started today.

Addressing the students and parents during the Orientation Session held recently, Prof. Bhaskar Ramamurthi, Director, IIT-Madras, said that the academic programs at the Institute are designed in a manner that students have adequate time to pursue co-curricular and extra-curricular activities, along with their studies.

He urged the incoming students to lead a disciplined life and be sensitive towards the animals residing on Campus such as deers, blackbucks and monkeys.

Prof. Bhaskar Ramamurthi also urged the parents to tell their wards to take adequate sleep and rest. "Parents should tell their children that they should never miss their breakfast," he added.

#### Solar-powered classrooms

Two new modern solar-powered classroom complexes – the Raman and Ramanujan Blocks, designed exclusively for freshmen, was inaugurated by Prof. Bhaskar Ramamurthi on 21 July 2017. Constructed at a cost of Rs 7.7 crore, it is an energy-efficient "green building" with several pioneering concepts. The entire building is powered by a 10 kW Solar PV system, which directly supplies at 48V DC (an inverterless system). It also has novel DC-based electrical system with highly efficient DC lights and fans.

The building designs were modified to accommodate the existing trees. The tree cover around complexes has been preserved. The total floor area of the two blocks combined is 33,571 sq. ft. The building has excellent North-South ventilation and ample natural lighting.

It features designer blackboards and classrooms having been equipped for laptop hook-ups and other modern amenities.

Each of the blocks houses six classrooms, each with a capacity of 84 seats. Total capacity of both blocks combined is 1,008 seats. Most classes for the first year students will be held in these twelve classrooms.

#### Mobile App for Safety

The Institute is beefing up the use of a mobile app for students' safety this academic year. The app, which was being used as a pilot project in previous years, will send out an alert if a student, who perceives he/she is in some sort of danger, presses the power button twice, explained Prof. Sivakumar M. Srinivasan, Dean (Students), IIT Madras.

Explaining its' features, he said that a set of numbers including the Security Personnel have been pre-loaded on to this app. Once a student activates the app, an alert along with the real-time location of the student in distress will go to all the pre-loaded numbers.

#### Solar vehicle

IIT-Madras is moreover, launching, as a pilot project this year, a solar-powered pedal-assisted vehicle to help differently abled hostel students travel to their classrooms. The vehicle will have a seating capacity of four. Based on the requirement, this project will be scaled up in near future.

Prof. Sivakumar informed that this vehicle was designed by Pi Beam Labs, a start-up incubated at the IIT-Madras Incubation Cell.

#### Other initiatives

IIT Madras is furthermore, having a Peer-Assisted training Program, wherein a senior will help an allotted group of about 3 to 4 freshers in a few subjects such as Maths, Physics and Thermodynamics by holding discussions with them, clarifying doubts and guiding them in solving problems.

A 'Life Skills' course is also being offered for the new students as a structured way of induction. The 'Life skills 1' and 'Life skills 2' are offered in the first two semesters for all the undergraduate students. The course initiates them into thinking about the life purpose leading to the question on purpose of their engineering education. The course covers many of the human values like empathy, care for nature, aspirations and gender diversity.

There are several systems, structures and activities in place at IITM to promote emotional wellbeing of the students.

It consists of student bodies, faculty mentors, Chief mentor, wardens, professional counsellors, telephonic and online counselling services, and psychiatrists. The coordinating officer who is in-charge of the wellness cell integrates all the resources mentioned above to ensure seamless service to the students. It focussed on the following aspects: 1. Mental wellness; 2. Physical Wellbeing; 3. Social Adaptation; 4. Academic support; 5. Infrastructural Support; 6. Team building and motivational events.

Further, a new food court with six stalls is also being opened this year in the campus along with two food courts in the hostels.

Date: 1st August 2017

Publication: Skill Outlook

Edition: Online

Journalist: NA

Professor: Prof. Sivakumar M. Srinivasan

**Headline: IIT Madras launches Mobile App for student safety and solar-powered classrooms & vehicles while welcoming new students**

URL: <http://skilloutlook.com/education/iit-madras-launches-mobile-app-student-safety-solar-powered-classrooms-vehicles-welcoming-new-students>

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Date: 1st August 2017

Publication: BL on Campus

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: State-of-the-art facilities for freshers at IIT-M**

URL: <http://www.bloncampus.com/news-wrap/iit-madras-welcomes-new-students-with-state-of-the-art-infrastructure-and-new-initiatives/article9795675.ece>

### State-of-the-art facilities for freshers at IIT-M



Solar powered classrooms, a safety app, and coaching on life-skills and well-being are all on offer

The new academic sessions of the B.Tech, B.Tech-M.Tech (dual Degree) and MA degrees began today at the Indian Institute of Technology Madras.

Addressing the students and parents at the recent orientation session, Prof Bhaskar Ramamurthi, Director, IIT-Madras, said that “the academic programmes at the Institute are designed so that students have adequate time to pursue co-curricular and extra-curricular activities, along with their studies.”

He urged the incoming students to lead a disciplined life and be sensitive towards the animals residing on campus — the deer, blackbuck and monkeys.



Prof. Ramamurthi also urged the parents to tell their wards to get adequate sleep and rest. “Parents should tell their children that they should never miss their breakfast,” he added.

### Solar-powered classrooms

Two solar-powered classroom complexes — the Raman and Ramanujan Blocks — exclusively for freshmen, were inaugurated by Prof Ramamurthi on July 21. Constructed at a cost of ₹7.7 crore, they are energy-efficient green buildings featuring several pioneering concepts. The entire building is powered by a 10 kW Solar PV system, which directly supplies at 48V DC (an inverterless system). It also has novel DC-based electrical system with highly efficient DC lights and fans.

The building designs were modified to accommodate the existing trees. The tree cover around the complex has been preserved. The total floor area of the two blocks combined is 33,571 sq ft. The buildings have excellent north-south ventilation and ample natural lighting.

They feature designer blackboards and classrooms, and are equipped for laptop plug-ins, connectivity and other amenities.

Each block houses six 84-seater classrooms. Total capacity of both blocks combined is 1,008 seats. Most classes for the first-year students will be held in these 12 classrooms.

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### Other initiatives

As part of the peer-assisted training programme, a senior will help an allotted group of about three or four freshers in a few subjects such as Maths, Physics and Thermodynamics and guide them in solving problems.

A 'Life Skills' course, in two modules, is also being offered for new students as a structured way of induction in the first two semesters for all the undergraduate students. The course initiates them into thinking about the purpose of life, leading to their questioning the purpose of their engineering education. The course covers values such as empathy, care for nature, aspirations and gender diversity.

Several systems, structures and activities are in place at IIT-M to promote emotional well-being of the students. It consists of student bodies, faculty mentors, chief mentor, wardens, professional counsellors, telephonic and online counselling services, and psychiatrists. It focusses on the following aspects: mental wellness; physical well-being; social adaptation; academic support; infrastructure support; and team building and motivational events.

Date: 1st August 2017

Publication: Web India 123

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT-M welcomes freshers with new new initiatives**

URL: <https://news.webindia123.com/news/articles/india/20170731/3158860.html>

### **IIT-M welcomes freshers with new new initiatives**

The Indian Institute of Technology, Madras (IIT-M) today welcomed the newly admitted students, with state-of-the-art infrastructure and several new initiatives intended to give them a topnotch experience in one of the most prestigious academic institutions in the world. The new academic session of the Institute for the B.Tech, B.Tech-M.Tech (dual Degree) and MA students started today. Addressing the students and parents during the Orientation Session IIT-M Director Prof Bhaskar Ramamurthi said the academic programs at the Institute were designed in a manner that students have adequate time to pursue co-curricular and extra-curricular activities, along with their studies. He urged the freshers to lead a disciplined life and be sensitive towards the animals residing on the campus such as deers, blackbucks and monkeys. Prof Ramamurthi also urged the parents to tell their wards to take adequate sleep and rest. "Parents should tell their children that they should never miss their breakfast," he added. Two new modern solar-powered classroom complexes, designed exclusively for freshers and built at a cost of Rs 7.7 crore, was inaugurated by Prof Bhaskar Ramamurthi on July 21, 2017.

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Date: 1st August 2017

Publication: UNI

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT-M welcomes freshers with new new initiatives**

URL: <http://www.uniindia.com/iit-m-welcomes-freshers-with-new-new-initiatives/states/news/946441.html#7Gf5MX6eCzv2dKWo.99>

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Date: 1st August 2017

Publication: The News Now

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT-M welcomes freshers with new new initiatives**

URL: <http://www.thenewsnow.co.in/newsdet.aspx?q=34770>

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Date: 2nd August 2017

Channel: DD Podhgai

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

Headline: IIT Madras welcomes new students with state-of-the-art infrastructure and new initiatives



Date: 2nd August 2017

Publication: Chennai Patrika

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT Madras welcomes new students with state-of-the-art infrastructure**

URL: <http://news.chennaipatrika.com/post/2017/07/31/IIT-Madras-welcomes-new-students-with-state-of-the-art-infrastructure.aspx>

### **IIT Madras welcomes new students with state-of-the-art infrastructure**

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Date: 2nd August 2017

Publication: HT Syndication

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT Madras welcomes new students with state-of-the-art infrastructure and new initiatives**

URL: <http://www.htsyndication.com/htsportal/india-education-diary/article/iit-madras-welcomes-new-students-with-state-of-the-art-infrastructure-and-new-initiatives/22114435>

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Chennai, Aug. 1 -- <https://indiaeducationdiary.in/wp-content/uploads/2017/07/A-view-of-one-of-the-new-academic-complexes-inaugurated-recently-for-new-students-at-IIT-Madras.jpg>

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Date: 2nd August 2017

Publication: Eenadu

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT-M opens to freshers with ultra modern facilities, director makes emotional appeal**

URL: <http://www.eenaduindia.com/states/south/tamil-nadu/2017/08/01112516/IITM-opens-to-freshers-with-ultra-modern-facilities.vpf>

### **IIT-M opens to freshers with ultra modern facilities, director makes emotional appeal**

Chennai: The fresh batch of Indian Institute of Technology-Madras (IIT-M) has started in the sprawling campus in the city, where various new facilities have been made. Two new modern solar-powered classroom complexes, designed exclusively for freshers and built at a cost of Rs 7.7 crore, have been inaugurated. Also, to ensure the safety of students, an app has been developed. The app, according to professor Sivakumar M Srinivasan, dean (students), IIT-M, was being used as a pilot project in previous years.

"It will send out an alert if a student, who perceives that s/he is in some sort of danger, presses the power button twice," he said.

A solar-powered pedal assisted vehicle to help differently-abled hostel students travel to their classrooms has also been launched. Initially, the vehicle will have a seating capacity of four and it will later be expanded.



Welcoming freshers, IIT-M director professor Bhaskar Ramamurthi said students should lead a disciplined life and be sensitive towards the animals residing on the campus such as deer, blackbucks and monkeys.



Urging parents to tell their wards to take adequate sleep and rest, he said, "parents should tell their children that they should never miss their breakfast."

Date: 2nd August 2017

Publication: News Today

Edition: Online

Journalist: NA

Prof. Bhaskar Ramamurthi & Prof. Sivakumar M. Srinivasan

**Headline: IIT-M opens door to freshers**

URL: <https://www.newstodaynet.com/index.php/2017/08/01/iit-m-opens-door-to-freshers/>

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Chennai: Indian Institute of Technology Madras (IIT-M) welcomed the newly admitted students, with state-of-the-art infrastructure and several new initiatives intended to give them a top-notch experience in one of the most prestigious academic institutions in the world.

The new academic session of the institute for the B Tech, B Tech-M Tech (dual Degree) and MA students commenced on Monday. The number of girl students increased by 17 per cent this year to touch 144 students in undergraduate courses, a press release said.

Addressing the students and parents during the orientation session, IIT-M director Bhaskar Ramamurthi said that the academic programmes at the institute are designed in a manner that students have adequate time to pursue co-curricular and extra-curricular activities, along with their studies.

He urged the incoming students to lead a disciplined life and be sensitive towards the animals residing on campus such as deer, blackbucks and monkeys.

Bhaskar Ramamurthi also urged the parents to tell their wards to take adequate sleep and rest. "Parents should tell their children that they should never miss their breakfast," he added.

#### What students will get

##### Solar-powered classrooms

Two new modern solar-powered classroom complexes – the Raman and Ramanujan Blocks, designed exclusively for freshers was inaugurated by Bhaskar Ramamurthi recently. Constructed at a cost of Rs 7.7 crore, it is an energy-efficient 'green building' with several pioneering concepts.

##### Mobile App for Safety

The institute is beefing up the use of a mobile app for students' safety this academic year. The app, which was being used as a pilot project in previous years, will send out an alert if a student, who perceives he/she is in some sort of danger, presses the power button twice, explained Professor Sivakumar M Srinivasan, Dean (Students), IIT Madras.

##### Solar vehicle

IIT-Madras is moreover, launching, as a pilot project this year, a solar-powered pedal-assisted vehicle to help differently abled hostel students travel to their classrooms. The vehicle will have a seating capacity of four. Based on the requirement, this project will be scaled up in near future.

##### Life skills course

The 'Life skills 1' and 'Life skills 2' are offered in the first two semesters for all the undergraduate students. The course initiates them into thinking about the life purpose. The course covers many of the human values like empathy, care for nature, aspirations and gender diversity.

Date: 2nd August 2017

Publication: Dinamalar

Edition: Chennai

Page no.: 2

Journalist: NA

Headline: Mobile App in IIT for students safety

URL: [http://www.dinamalar.com/news\\_detail.asp?id=1824550](http://www.dinamalar.com/news_detail.asp?id=1824550)

## ஐ.ஐ.டி., மாணவர்கள் பாதுகாப்புக்கு புதிய 'மொபைல் ஆப்' அறிமுகம்

- நமது நிருபர் -

தேசிய உயர் கல்வி நிறுவனமான, சென்னை, ஐ.ஐ.டி.,யில், மாணவர்களின் பாதுகாப்புக்கு, 'மொபைல் போன் ஆப்' அறிமுகம் செய்யப்பட்டு உள்ளது.

பிளஸ் 2 முடித்து, ஜே.இ.இ., தேர்வில் தேர்ச்சி பெற்ற மாணவர்கள், சென்னை, ஐ.ஐ.டி.,யில், முதலாம் ஆண்டில் சேர்க்கப்பட்டு உள்ளனர். இவர்களுக்கான வகுப்பு, நேற்று முன்தினம் துவங்கியது. முன்னதாக, மாணவர்கள் மற்றும் பெற்றோருக்கு வழிகாட்டும் கருத்தரங்கம் நடத்தப்பட்டது.

கடந்த ஆண்டை விட, இந்த ஆண்டு, 17 சதவீதம் கூடுதலாக, 144 மாணவியர், சென்னை, ஐ.ஐ.டி.,யில் சேர்ந்துள்ளனர். சூரிய சக்தியில் இயங்கும் இரு புதிய கட்டடங்களும் திறக்கப்பட்டு உள்ளன. இவற்றில் தலா, 84 மாணவர்கள் அமரும் வகையில், 12 புதிய வகுப்பறைகள்

கட்டப்பட்டு உள்ளன.

இந்த கட்டடப் பகுதியில், ஏற்கனவே இருந்த மரங்களை அப்படியே வளர்க்கும் வகையில், இட வசதி செய்யப்பட்டு உள்ளது. மேலும், வளாகத்தில் பசுமையை பராமரிக்க, மாணவர்களை, ஐ.ஐ.டி., நிர்வாகம் அறிவுறுத்தி உள்ளது.

மன அழுத்தத்தால் மாணவர்கள் தற்கொலையில் ஈடுபடுவதை தடுக்கும் வகையில், புதிய, 'மொபைல் போன் ஆப்' அறிமுகம் செய்யப்பட்டுள்ளது. இந்த செயலியில், பாதுகாப்பு அதிகாரிகள், பேராசிரியர்கள், விடுதி பொறுப்பாளர்களின் எண்கள் பதிவு செய்யப்பட்டு உள்ளன.

மாணவர்கள் மன அழுத்தமாக இருந்தால், அதில் உள்ள பொத்தானை அழுத்தினால், அந்த தகவல், செயலியில் இடம் பெற்றுள்ள, ஐ.ஐ.டி., நிர்வாகத்தினரை உடனே எச்சரிக்கும்.

குரங்குகளிடம் எச்சரிக்கை

மாணவர்களுக்கான வழிகாட்டும் நிகழ்ச்சியில், 'ஐ.ஐ.டி., வளாகத்தில் உள்ள பசுமை பிரதேசத்தில், குரங்குகள், புள்ளி மாண்கள் மற்றும் கலை மாண்கள் வாழ்கின்றன. அவற்றின் உயிருக்கு ஆபத்து ஏற்படாமல் நடந்து கொள்ள வேண்டும். குரங்குகளிடம் எச்சரிக்கையாக இருக்க வேண்டும்' என, அறிவுறுத்தப்பட்டு உள்ளது.

இதன் மூலம், அந்த மாணவருக்கு தேவையான கவுன்சிலிங் வழங்கப்படும் என, ஐ.ஐ.டி., அறிவித்துள்ளது.

மேலும், மாற்றுத்திறனாளி மாணவர்கள், விடுதியில் இருந்து கல்லூரிக்கு வந்து செல்ல, சூரிய மின் சக்தியில் இயங்கும் வாகனம் அறிமுகம் செய்யப்பட்டு உள்ளது.

Date: 7th August 2017

Publication: The New Indian Express- Education Express

Edition: Chennai/Kochi

Page no.: 12

Journalist: NA

**Headline: IIT-M welcomed its new student batch**



## Interview

### NIRF & ENGINEERING

IIT Madras topped the NIRF chart this year. In a conversation with Sreerupa Sil, Professor Bhaskar Ramamurthy speaks about the initiation and purpose of NIRF Ranking.

**Q: Your opinion about Rankings!**

I think it is just a way of looking at things differently at the day to day activities. I am sure everyone will improve gradually but we shouldn't take it too seriously since it is metrics at the end of the day. To achieve better ranks, institutions end up doing something right.

**Q: Do you think it was wise of Indian Government to enter rankings of institutions?**

Rankings should not be done by the government. It is not being done by GOI in that sense. Right now it is being done by NBA which is an autonomous authority. The international rankings are done based on research publications, academic and employer global perception. They are useful in some ways for the ones who want to make themselves globally relevant. But for many students of India who want to know what is to be done after school, these international rankings doesn't help. The magazine rankings help these students. We just do not have the idea how they do it.

**Q: Could you elaborate?**

Indian Institutions are organized by disciplines. If one chooses Humanities, there are certain kind of universities, for engineering there are IITs, national law schools for students interested in law and so on. Hence a metric system was needed to be designed to treat them separately based on disciplines, unlike international rankings where all institutions are treated as universities. This extended a necessity for such focused and data driven ranking.

## “Engg must solve basic problems”

**Q: You have been a part of the NIRF initiating committee...**

Yes and we too thought how should we do this. We tried to identify the core objective of ranking. It was primarily for students. Government and public as well wanted to know how each institution was performing. We liked to know globally too but we couldn't attain all in one go. We thought about the kind of data we will gather, how to protect ourselves from fudging of the data. However, the



▶ **BHASKAR R.**  
Director, IIT Madras

more dependent it gets on data, the more accurate it gets

**Q: Perception seems to be an important component...**

Perception is also important. In NIRF, it has been reduced to 10% while in international rankings, the weight of perception is about 40% to 60%. Keeping everything aside, if an institution is not perceived to be at large either to be good or bad, the data should speak

why it is perceived that way. But we thought too much weightage on perception would be self-fulfilling.

**Q: What are the plans for IIT Madras?**

Broadly we want to keep improving our world standing. We are addressing issues such as water, electricity, government, capacity building in other engineering colleges.

▶ [sreerupa@businessworld.in](mailto:sreerupa@businessworld.in)



Date: 19th August 2017  
Publication: BW Education  
Edition: Magazine (June-July edition)  
Page no.: 12  
Journalist: NA  
Professor: Prof. Bhaskar Ramamurthi  
Headline: IIT Madras offers ID DD programme

## IIT MADRAS OFFERS IDDD PROGRAMME

F

FROM THE upcoming 2017 academic session, the B.Tech. and Dual Degree (B.Tech + M.Tech) students of Indian Institute of Technology Madras (IIT Madras) will have an option to upgrade to an interdisciplinary dual degree (ID DD), programme. The ID

DD students will study for five years and obtain B.Tech in parent discipline and M.Tech. in an interdisciplinary area. The upgrade option is available to those students of UG and DD who have a CGPA > 8.00 at the beginning of the 5th Semester of their study.

Bhaskar Ramamurthi, Director of IIT Madras said, "As a part of its endeavor to offer more flexibility in education, IIT Madras will be



allowing its UG and DD students to gain Dual Degree in four of the highly sought-after domains of the present times: (i) Advanced Materials & Nano Technology, (ii) Biomedical Engineering, (iii) Computational Engineering, and (iv)

Data Science." This initiative will not only enable students to study and earn an added qualification in the area of their choice, but will also be useful to those who may have missed out on getting their preferred discipline at the time of admission.

Date: 19th August 2017  
 Publication: BW Education  
 Edition: Magazine (June-July edition)  
 Page no.: 22  
 Journalist: NA  
 Professor: Prof. Bhaskar Ramamurthi  
**Headline: Top Engineering Initiatives: IIT M**

**TOP ENGINEERING INITIATIVES**



**INDIAN INSTITUTE OF TECHNOLOGY MADRAS**

8000+ STUDENTS	550+ FACULTIES	327 PATENTS	5000+ PUBLICATIONS
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**DEPARTMENTS:**

Aerospace Engg. Applied Mechanics, Biotechnology, Chemical, Chemistry, Civil, Computer Science, Electrical, Engineering Design, Management Studies, Mathematics, Mechanical, Metallurgical & Materials, Ocean,

**FEATURED PATENT**

Enhancements to a CDMA system to support in-band personal indoor relays. This invention relates to CDMA communication systems, and more particularly to relays in CDMA communication systems. The principal object of this invention is to achieve the operating mechanism and method for introducing indoor personal relays in an existing CDMA system. The embodiments herein achieve an operating mechanism and method for introducing indoor personal relays in an existing CDMA system.

**NEW ENGINEERING INITIATIVE**

**N**PTEL National Programming on Technology Enhanced Learning (NPTEL) is an initiative of the seven Indian Institutes of Technology (IIT Bombay, Delhi, Guwahati, Kanpur, Kharagpur, Madras and Roorkee) and Indian Institute of



SARDAR PATEL ROAD, CHENNAI, TAMIL NADU

**PERSONALISED CURRICULUM**

Science Bangalore (IISc) for creating video and web course contents in engineering and science. Into its 12th year now, there are 900+ web and video courses across 23 disciplines available for download and viewing on the NPTEL web site distributed under the CC-BY-SA license. NPTEL

Open Online courses were initiated so that students anywhere can directly learn from faculty in top colleges. While enrollment and learning is free, students can also obtain a certificate from the IITs, based on successful completion of an exam, for which there is a nominal examination fee. Online learning offers

a new way to explore subjects that one is passionate about. Students will learn for free, learn Together and learn from the Experts. The courses have no eligibility criteria and are open to anyone and everyone. Students can review and assess their progress and directly interact with course instructors to understand concepts better. An optional in-person proctored certification exam is offered at the end of the course to earn certificates from the IITs.

**“ THE HARD WORK BEGINS ONCE YOU ENTER AN ENGINEERING PROGRAMME. MR. BHASKAR RAMAMURTHI, DIRECTOR**

Date: 27th August 2017

Publication: The Hindu

Edition: Chennai

Page no.: 4

Journalist: NA

Alumni/students: G Pranav Hari & Rahul Humayun

**Headline: IIT-M wins preliminary round of BusinessLine quiz**

URL: <http://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/iit-m-wins-preliminary-round-of-businessline-quiz/article19568773.ece>

## IIT-M wins preliminary round of BusinessLine quiz

Over 65 teams took part in the event



**Proud winners:** Miraj C. Vora, left, quiz master, and G.K.Sudhakar Rao, DGM, Union Bank of India, with Rahul Humayun and G. Pranav Hari from IIT-Madras. • R. RAJINDRAN

**STAFF REPORTER**  
CHENNAI

A two-member team from IIT-Madras won the preliminary round of *The Hindu* BusinessLine Cerebration Business Quiz on Saturday.

The team with G. Pranav Hari, a civil engineering student, and Rahul Humayun, studying chemical engineering, both from IIT-M, forged ahead during the buzzer round to bag a ₹10,000 cheque and earned a seat in the final round of the 15th edition of Cerebration - the Business Line Corporate Quiz 2017 presented by Union Bank of India to be held in Mumbai.

The event is also being organised in other metros — at FHB in Delhi on September 2, ; at Jain University in Bengaluru on September 9; and at Ramada Juhu in Mumbai on September 23.

The Loyola Institute of Business Administration campus was abuzz on Saturday afternoon as over 65 teams from more than 20 colleges and as many companies attended the preliminary written round to be

one of the six teams to compete in the business quiz.

Quiz master Miraj C. Vora of Quiz Works took the selected teams from Sai MitraConstructions, Tata Consultancy Services, Asian College of Journalism, Ford India, Cognizant Technology and IIT-M through a lively hour-and-a-half session of multiple rounds of questions.

A tie-breaker was needed between TCS and Ford in which TCS came out ahead as the runner-up.

Cerebration Business quiz is presented by Union Bank of India and powered by *The Hindu* Business Line. The event is managed by WOOT Factor Events Pvt Ltd, and Quizworks is the quizzing partner. (More details at: <http://www.cerebration.co.in>)



Date: 28th August 2017

Publication: The Hindu Business Line

Edition: Delhi/Chennai/Hyderabad/Kolkata/Ahmedabad

Page no.: 18

Journalist: NA

Alumni/students: G Pranav Hari & Rahul Humayun

**Headline: IIT Madras team wins preliminary round**

URL: <http://www.thehindubusinessline.com/news/iitm-team-wins-preliminary-round-of-cerebration-business-quiz/article9831754.ece>



Miraj C Vora (left), Quiz Master, QuizWorks; GK Sudhakar Rao, DGM, Union Bank of India (3<sup>rd</sup> from left); with G Pranav Hari (2<sup>nd</sup> from left) and Rahul Humayun of IIT-Madras, in Chennai, on Saturday. BY G. CHIDH

#### CEREBRATION BUSINESS QUIZ

## IIT-Madras team wins preliminary round

#### OUR BUREAU

Chennai, August 27

A two-member team from IIT-Madras won the preliminary round of *The Hindu BusinessLine* Cerebration Business Quiz on Saturday.

G Pranav Hari, a civil engineering student, and Rahul Humayun, studying chemical engineering, forged ahead during the buzzer round to bag a ₹10,000 cheque and earn a seat in the final round of the 15<sup>th</sup> edition of Cerebration — *BusinessLine* Corporate Quiz 2017. Presented by Union Bank of India, the final will be held in Mumbai.

The event is being organised in other metros — in Delhi on September 2 at the Fortune Institute of International Business (FIB); in Bangalore, on September 9, at Jain University; and in Mumbai, on September 23 at Ramada Jubu.

The Loyola Institute of Business Administration here was abuzz on Saturday afternoon as over 65 teams from more than 20 colleges and as many com-

panies attended the preliminary written round to select the six teams to compete in the business quiz.

Quiz master Miraj C Vora of QuizWorkstested the selected teams from Sai Mitra Constructions, Tata Consultancy Services, Asian College of Journalism, Ford India, Cognizant Technology and IIT-Madras through the lively hour-and-a-half-long quiz with multiple rounds.

TCS was declared the runner-up after a tie-breaker with Ford.

Cerebration Business Quiz is presented by the Union Bank of India and powered by *The Hindu BusinessLine*. The event is managed by WOOT Factor Events, and Quizworks is the quizzing partner. (More details at: [www.cerebration.co.in](http://www.cerebration.co.in))

The quiz targets business professionals, corporate executives, MBA aspirants and students from India's biggest B-schools. It is packaged as India's toughest corporate business quiz with four teams participating in the grand finale in Mumbai for the top three spots.

**IIT Madras is a multi-cultural  
campus**

Date: 3rd August 2017

Publication: The Hindu

Edition: Chennai

Page no.: 3

Journalist: NA

**Headline: Chennai Today- Culture**

## CULTURE

**IIT Madras; New Zealand India Research Institute; Victoria University of Wellington and Anglos In The Wind:** Screening of documentary film 'The Anglo Indians of Madras', IC and SR Auditorium, IIT Madras, 4 p.m.

Date: 3rd August 2017

Publication: The New Indian Express- City Express

Edition: Chennai

Page no.: 2

Journalist: NA

**Headline: Anglo Indian Day**



Date: 3rd August 2017

Publication: Deccan Chronicle

Edition: Kochi

Page no.: 2

Journalist: NA

**Headline: IIT Madras to Hold Spark Quiz on August 12**

## IIT MADRAS TO HOLD SPARK QUIZ ON AUGUST 12

**Kochi:** IIT Madras is organising Spark, a two-tier mega event, with the first phase being the Spark Junior Quiz (SJQ), a national quiz competition to be conducted in over 20 cities. The winners will

be invited to IIT Madras for a national science conference along with a sponsored trip to research centers. It will be conducted in Kochi, Trivandrum, Calicut and Thrissur on August 12. Those interested can

register online at [spark.shaastra.org](http://spark.shaastra.org) while spot registrations, subject to availability, will be allowed from 9 am - 10 am. Students from Classes 8 to 12 in teams of two can participate.



Date: 4th August 2017

Publication: The Times of India

Edition: Chennai

Page no.: 3

Journalist: NA

Headline: World Anglo Indian Day celebrated

# World Anglo Indian Day celebrated

TIMES NEWS NETWORK

**Chennai:** They may be a day late in marking the World Anglo Indian Day, but Harry Maclure, editor, *Anglos In The Wind* (AITW), is intent on making it the community's most cerebral celebration to date.

Setting up base on the ITM campus, Maclure and his team have organised a host of seminars, book readings and a documentary screening to showcase the past and present of the 500-year-old community.

On Wednesday, Maclure and Anglo-Indian researcher Richard O'Connor, showed

**The next 2 days will feature presentations by scholars researching the community**

their 50-minute documentary — *The Anglo Indians of Madras*, which took the audience through how the community came to settle in different pockets of the city — St Thomas Mount, Tambaram, Palavaram, Perambur, Madhavaram, Royapuram and George Town. The documentary not only showcased the lives and houses of the community, but also spoke at length about

how the community in the city has dwindled in terms of numbers, with several homes being abandoned for decades.

"In the 70s and 80s every other student in a school in the city was an Anglo-Indian. Today, my son is the only Anglo-Indian in his class," said O'Connor at the screening.

City chronicler S Muthiah, who was also present at the screening, spoke of how he felt the community ought to be called "Euro Indians".

"Members of the community are of varied descent, from Portuguese, Scottish, to Irish. They're not just of Anglo descent," he said, detailing their contributions.

"We decided that this year we will celebrate the Anglo Indian Day between August 3 and 5 and not the usual way with song and dance and feasting. We are starting with a documentary film on Thursday, and then on Friday, we have a book reading by Padma Shri awardee author Irwin Allan Sealy, who will be discussing his latest novel *'Zelaldinus: A Masque'*," said Maclure.

The next two days will feature presentations by scholars researching the community — from their hybrid identities and micro history to the rise of Anglo Indian associations in post-colonial India.

Date: 5th August 2017

Publication: The New Indian Express- City Express

Edition: Chennai

Page no.: 1

Journalist: NA

Professor: Prof. Merin Simi Raj

Headline: What has come of 'midnight's orphans'?

## What has come of 'midnight's orphans'?



A research scholar presenting her paper at the conference

**W**hen India gained independence, our country was a home to half a million anglo-indians. Seventy years later, only one-fifth of that number remain. While many emigrated after independence, emigration continued upto the turn of the millennium but has slowed down to a trickle.

"We sparked the emigration trend after the economic liberalisation of India in the 90s," jokes Richard O'Connor, a senior custom official.

S Muttiah, Madras historian, believes the population is slowly growing now but observed that numbers will not bring back the community culture and lifestyle of our country's 'midnight's orphans' — the theme of this year's International Workshop and Seminar on Anglo Indian Studies. The three-day event was organised on occasion of World Anglo Indian day, by the Department of Humanities, IIT Madras, in association with the New Zealand India Research Institute and Anglo-Ink Chennai.

The first day of this conference addressed the conditions of Anglo-Indians in diaspora and in India. Research scholars from across the country brought out the depiction of the Anglo-Indian community in cinema.

A comparison by Paromita Dutta showed the changing attitudes of the Indian community to the Anglos in two movies — *36 Chouringhee lane* and *Bow Barracks Forever*. "One might think life for the Anglo Indians before Independence was easy. But that is a very wrong notion. Only after 1857, Anglo Indians started gaining some opportunities in sectors like the railways, defence. Before that they were treated worse than Indians," says Muttiah.

The slow disappearance of Anglo-Indian Communities in Chennai sparked a programme by the Department of Humanities and Social Science, IIT Madras to study the community in Chennai. "This is the first time a conference for Anglo Indian studies has taken place in the South. Chennai still has a sizeable population of Anglo-Indians (30,000) so we decided to tune in on the state of the community here," says Merin Simi Raj, Assistant professor at IIT Madras.

While the first day looked at the depiction of Anglo-Indians society in diaspora and the second day (Saturday) will look at post-colonial Anglo Indian literature. The seminar will begin at 9 am and have personalities like Allan Sealy, author of *Zelatinus*, attending it.

**Thinking of Anglo-Indians as British Indians is a misconception. They are of a much richer and wider lineage. Their British fathers were just the last to leave**

—S Muttiah, Madras historian



Photo: Martin Louis

Date: 5th August 2017

Publication: Careers 360

Edition: Online

Journalist: Bachan Thakur

Alumni/student: Vineesha Badabhagni

**Headline: Campus Life - Let's Explore IIT Madras with Vineesha Badabhagni**

URL: <https://engineering.careers360.com/articles/campus-life-at-iit-madras-vineesha-badabhagni>

### Campus Life - Let's Explore IIT Madras with Vineesha Badabhagni



Like thousands of students and parents, I would always think that the Indian Institutes of Technology (IITs) are all about “Academics” till I got to converse with one of the final year students at IIT Madras, the institute founded in the year 1959. Apart from academics, the “Insti (Institute)”, as the students here call it, promotes talents of all sorts. Be it cultural activities, contesting elections or building a foundation for your future dreams (which may not be Engineering only), [IIT Madras](#) is the place. In a candid conversation with Vineesha Badabhagni (VB), Secretary, International and Alumni Relations, IIT Madras, Careers360 decodes many such myths for aspiring students who dream to get into IIT Madras, however, are sceptical about various factors associated with the institute. Let's explore IIT Madras with Vineesha and find out what all is the institute about apart from academics.

#### Excerpts from the interaction with Vineesha Badabhagni

**Careers360:** Tell us something about yourself. Where are you from and where did you do your schooling from?

**VB:** My name is Vineesha Badabhagni. I hail from Nellore, Andhra Pradesh (AP). In AP, we students come from these coaching factories. I come from Narayana factory where I studied for 4 years at the institute.

**Careers360:** Which branch are you studying in and why did you choose this? Was the institute and course your first choice or one of the options you had chosen during counselling?

**VB:** I am a final year student in Electrical Engineering at IIT Madras. With 962 rank in [JEE Advanced](#), I would have got Computer Science, however, my first choice was Electrical Engineering and thus I ended up taking admission in this branch only. I was getting [IIT Bombay](#) and [IIT Delhi](#) too, however, after my mother's pursuance, I finally opted for IIT Madras which is closer to my home town.

**Careers360:** What were your reactions after getting the admissions and your expectations? Was the reality matching your expectations?

**VB:** Honestly, it was beyond my expectation in many ways, except for a couple of things. The first impression was jaw-dropping. As soon as we entered IIT Madras campus, I got lost in the beauty of the campus itself. There was a different level of excitement, however, the hostel was a little disappointing, as it was quite similar to our coaching institute hostel where we share rooms with other students. But despite a couple of things, the entire experience was amazing.



**Careers360:** Is there any difference in actuality about how you had imagined an IIT would be?

**VB:** Before coming here, we would just think that an IIT is all about academics only. We would just consider an IIT for good placements and exposure. But, once I joined IIT Madras, it was completely contrary to our imagination. With experience, I learned that IITs are not only about mugging and finishing the course. They are much more beyond that.

**Careers360: How do you balance your studies, projects, exams and other activities?**

**VB:** You have 5-6 academic hours in a day. Rest of the hours in a day, you may sleep, relax or anything. Nobody is going to check you. But as per their interests, everyone figures out their area where they want to go further. As per that, we all get ourselves involved. To be frank, everyone has a packed schedule, which goes down to even minute to minute. Even Vineesha has to rush quickly for her class once our conversation gets over.



**Careers360: It is said rules for the male and female students are different. Do you feel any discrimination and what do you think should be done about it?**

**VB:** Yes, there are incidences where girl students have to face discrimination. For example, when students contest elections, female candidates have to take so many permissions from the faculty, warden, etc, which is not the case with male students. This was the only area where I felt that boys have more liberal rights than girls. However, at the end of election campaign, I could exercise all the rights which the boys do. Though I feel we as girls face challenges in some areas more than the male candidates, but there is actually no discrimination as such. It is actually the girls who have to stand up.

**Careers360: Describe a typical day at your institute – what do you do from the time you wake up till you go to sleep?**

**VB:** A day at IIT Madras varies from person to person. However, majorly it is driven by the number of Credits you opt for. We have 5 academic days in a week. In every semester, the students opt for 20-25 Credits. We have roughly 25 hours of classes per week for 25 credits. The classes start at 8 am and end at 5 pm. For instance, in my case I have opted for 2 lab courses, so 2 days in a week I have 3 hours classes, rest of the 3 days in the week I am free in the afternoon. Hardly any student at the institute is an early-riser. Most of us wake up around 7.15 am or so and rush rush to our classes.

**Careers360: Why do you think there are fewer girls in engineering especially in IITs, NITs inspite of doing well otherwise in the higher secondary levels? Do you think this overlaps into the scant presence of women in the engineering sector?**

**VB:** In my understanding, a lot depends on our parents and family members and second is that girls do not want to take the humongous stress the academics at [IITs](#) or NITs offer. When it comes to IITs, most of the girls' parents discourage them, looking at the amount of stress their daughter has to undergo. In my case, I received a lot of support from my family and parents to pursue my dream. However, the scenario is changing gradually. Back in 1980s, there would be hardly 2 girl students in an Engineering programme in a class of 250, whereas now, it's closer to the ration of 90:10, which I feel is far better. And this ration will further increase in the times to come.

**Careers360: Describe in your words how IIT Madras is like?**

**VB:** The institute acts a platform where you can give wings to your dreams. For instance, if one wants to join civil services, so the institute gives you so much of vast knowledge at all fronts that at the end you stand confident, making your own career choices in the 4-5 years you spend here.

Let me take you through what all IIT Madras offers to students:

### **What's Unique and Differentiating?**

May be not many know, but IIT Madras is gradually moving towards becoming a University offering courses in Humanities, Social Sciences, etc. For example, IIT Madras has department of Management Studies, Department of Social Sciences, which are becoming quite popular. Even people like who are pursuing engineering, get attracted to these programmes, says Vineesha.

### **SAATHI to hold your hand**

Once you start your academic journey at IIT Madras you may encounter various hiccups in your studies, but there is someone who takes care of your academic hurdles. **SAATHI**, as they call it, is an institute body which exists to help you out wherever in your academics, you feel stuck. You can choose a mentor from the SAATHI group who will help you clear all your doubts in academics. Whenever you need that mentor, he/she will be there for your rescue in academics.

### **In-House Email Service - S-Mail**

The institute has it own email system called –**S-Mail**. All the students and faculty use this email service which functions very smoothly. If you have got any issue, you can raise you concern through S-mail and your issue will be resolved.



### **Liberty goes Liberal at the Campus**

Walk in and walk out of the campus any hour of the day or at night given you carry your ID Card. You are not pushed to wear what you do not want to. There is no dress code in the campus. One can walk freely wearing anything one feels comfortable in (including shorts and minis).

### **Faculty-Student Ratio**

For [Electrical Engineering](#) fourth year batch, the faculty-student ration is 40:120, whereas, for the institute, it would be roughly 1:15.

## Feel Secure Inside

If you have got any security concerns, then walk down to or ask for Police help or reach out to the Security Guards available all around the campus. The institute also has its Security Section where anyone can complain regarding any security concerns. On top of this, you have **C-Cash**, a body responsible for handling sexual assault or harassment cases. Any male or female students can walk in freely and get their complaint registered.



## Infrastructure – Classrooms, Mess, Labs, Hostels

IIT Madras boasts of having one of the best infrastructures which is a mix of traditional and modern elements. Classrooms and labs are quite cosy and modern, except a few which are non-AC. You will be taught with the latest teaching methodology and techniques. It's said that in the classrooms the interest will chase you itself. The institute has over 100 well equipped laboratories and 23 Research Centres of Excellence.

The campus houses a Centre for Innovation whose motto is – “Walk in with an Idea, walk out with a product”. If you have an idea, you will find a mentor to guide you through. Entrepreneurial Cell and IITM Research Park act as stepping stones if you have an idea for a product, business or a start-up.

## Dine as per your comfort at Himalaya, Vindhaya or Jain Mess

The institute houses 3 different types of mess complexes – Omega mess **Himalaya**, (where boys and girls dine together), **Vindhaya complex**, which is especially for girls who want to dine separately and **Jain Mess**, for people who eat Jain food. Enjoy multi-cuisine at Quark Food Court.





### **Do It Yourself (DIY) at the Hostels**

Stay in a sharing room in the first year, upgrade to single/double room from the second year. You can even opt for an entire wing if you have a group of friends who want to stay together. Use your cupboard, table, fans, lights, but get your own bed. Do not use any high voltage electronic equipment (juicer, heater, etc) inside the hostel to avoid short circuit. Moreover, the electricity bill is paid by the institute. Wash your own clothes in the common washing area using the washing machines or use the laundry service. You have to yourself do dusting and cleaning of your hostel room. Getting some cleaner to do it for you is considered a

crime, so be mindful.

### **Eco-friendly Campus**

IIT Madras offers a mesmerising view for nature and wildlife-lovers within the campus area of about 250 hectares. Home to approximately 300 species of trees and plants, the institute has a wide range of wild species including jackals, blackbuck, mongoose, monkeys, squirrels, toddy cats, wild cats, flying fox, reptiles, about 40 different species of butterflies and about 100 species of birds. IIT-ians here co-exist with the wildlife ecosystem. Avoid carrying any eatables in open, as the monkeys will snatch it away. Keep your hostel rooms closed and locked.



### **Cycle around or use a Bus to Commute**

Every 15 minutes you will get a bus which takes you to different places in the campus. The bus service comes free for all students. Generally students are given cycles in the campus, but the students who do not have cycles, use the campus bus service. Any fault in the cycle, you need to get it fixed.

### **Hospital at your Service**

The on-campus Hospital has good doctors. One just needs to walk down and get himself/herself treated free of cost. All tests, consultations, medicines are given free. For major illnesses, you need to show your past records. The Hospital ambulance is available 24X7 and just a call away. It even takes you to hospitals outside IIT Madras in case of an emergency.





### Facilities for Sports & Health

IIT Madras believes that a healthy mind resides within a healthy body for which students can either exercise at the Institute Gymkhana or play games like Tennis, Basketball, TT or play cricket at the Chemplast Cricket Ground. You may also participate in various other sports at Manohar C Watsa Stadium or Sports Complex.

### Popular Hangouts – Relax at Besant Nagar Beach, watch a movie or go shopping in Phoenix Mall

Inside the campus, buy a laptop, pen drive or any merchandise at Gurunath Departmental Store or spend some leisure time at the Air-Conditioned (AC) Cafe Coffee Day (CCD), one of the most thronged places. Try various other restaurants in the campus as per your taste.

Outside IIT Madras, explore, relax or take a walk along Besant Nagar Beach, another popular hangout for IIT Madras students. You may go shopping or watch movies with friends at the Phoenix Mall, which is just walking from the campus.



### Clubs and Associations

IIT Madras has various clubs, associations and committees, including 12 cultural clubs and 12-15 technical clubs. Other bodies like pertaining to Career Development and Entrepreneurship Development, etc. look after various career development programmes for the students and encourages the entrepreneurs in the students. There are other associations and bodies like International Relations, Alumni Relations, Media Relations, Production Units for uploading videos, associations for cinematography and photography, cooking club, hiking club, etc. When a fresher comes in, the orientation is all about which club or association can one be a part of as per his/her interest.

### Digital Presence through Blogs and Social Media

Read Interviews and experiences of alumni/students and get career advice at Chennai36 Blog. The Fifth Estate (T5E), the media blog is about life in the city and the campus. The insti also comes up with annual and quarterly magazines to be circulated amongst the alumni. The latest happenings and events go on IIT

Madras Facebook Page. Each of the 9 Secretaries in the institute is responsible for the content being uploaded on their respective committee pages. Many student-members look after the FB pages.

### **Suggestion Box**

According to Vineesha's experience, most of the things are right in place except for one – the old, manual functioning system of the "Academic Section". "The Academic Section still works manually as a typical government office. All the work is done manually on paper wherein nothing happens through mails. The students have to wait in long queues, which is a tedious process. I wait for the day when the system here goes digital and everything is done online," signs off the final year student.

### **Campus Rules You Must Adhere To**

- Do not use any high voltage electronic equipment.
- Cooking in hostel is a complete no no.
- Always carry your ID Card with you.
- Do not get anyone to clean your room. Do it Yourself (DIY).

Meet your Credits at any cost in every semester.

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## ஐஐடியில் தேசிய கைத்தறி தின விழா

சென்னை, ஆக. 5: சென்னை ஐஐடியில் மத்திய தகவல் மற்றும் ஒளிபரப்பு அமைச்சகத்தின் கீழ் இயங்கும் கள விளம்பரத்துறையின் இசை மற்றும் நாடகப் பிரிவின் சார்பில் கைத்தறியை பொதுமக்கள் மற்றும் மாணவர்களிடம் பிரபலப்படுத்தும் விதமாக தேசிய கைத்தறி தின விழா சனிக்கிழமை நடைபெற்றது.

இந்த விழாவில் தகவல் மற்றும் ஒளிபரப்புத் துறையின் தென் மண்டல இயக்குநர் கே.முத்துகுமார், கள விளம்பரத்துறையின் தமிழ்

நாடு மற்றும் புதுச்சேரிக்கான இயக்குநர் எம்.அண்ணாதுரை, நெசவாளர் சேவை மையத்தின் இயக்குநர் விசேஸ் நதுயால், ஐஐடி.பதிவாளர் பி.ஸ்ரீராம் உள்ளிட்ட பலர் கலந்துகொண்டனர்.

நெசவுத்தொழிலில் ஈடுபட்டு வரும் நெசவாளர்களைப் பாராட்டி இந்த விழாவில் சிறப்பு செய்யப்பட்டது.

ஒரு கை மற்றும் ஒரு காலை மட்டும் பயன்படுத்தி எளிமை யான முறையில் நெசவு செய்யும் இயந்திரத்தை வடிவமைத்த, சேலத்

தைச் சேர்ந்த நெசவாளர் கார்ப்பன் கௌரவிக்ஷப்பட்டார்.

இந்த விழாவில் கலந்துகொண்ட நெசவாளர் கார்ப்பன், மாணவர்களுடன் கலந்துரையாடினார்.

அப்போது பேசிய அவர், ஆண் குதோறும் ஆகஸ்ட் 7 ஆம் தேதி தேசிய கைத்தறி தினமாக கொண்டாடப்படுகிறது. நம் நாட்டின் எதிர்காலம் நெசவுத் தொழிலைச் சார்ந்துள்ளது என்றார் அவர்.

இந்த விழாவில் கைத்தறி ஆடைகளுக்கான கண்காட்சியும், கலைநிபந்தனையும் நடைபெற்றன.

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Professor: Prof. Krishnan Balasubramanian

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# IIT Madras Tops in Industrial Consultancy Projects

**In 2015-16, IIT Madras had 737 projects and received ₹63.15 crore through earnings**

**Sreeradha D Basu**

Mumbai: The Indian Institute of Technology Madras has been going all out to promote a collaborative environment between industry and academia, a move that has helped it bag a significantly higher number of industrial consultancy projects.

According to National Institutional Ranking Framework (NIRF) 2017 data shared by IIT Madras, the institute leads among the top five IITs in terms of both industrial consultancy projects as well as earnings through that route. In 2015-16, IIT Madras had 737 projects from 383 clients and received ₹63.15 crore through industrial consultancy earnings. The number of consultancy projects increased 20% compared to that in the previous year. IIT Bombay had more clients (426) in 2015-16, but it bagged fewer projects (300) than IIT Madras and earned ₹15.14 crore. IIT Delhi had 428 projects from 305 clients, earning ₹39.95 crore through industrial consultancy in 2015-16.

"For the last few years, we have been actively trying to breach the physical gap between IITs and industry and the IIT Madras Research Park has had a significant role to play in this. In 2016-17, we had commitments of ₹80 crore, of which ₹70 crore has been realised," said Krishnan Balasubramanian, dean, industrial consultancy and sponsored research (IC&SR), IIT Madras. "We have about 40 companies who have their research facilities in our park now. By the end of 2016, that number should almost double."

IIT Madras Research Park is an independent company promoted by IIT Madras and its alumni that facilitates the promotion of research and development by the institute in partnership with industry. It helps companies with a research focus to set up a base in the park and leverage the expertise available at IIT Madras. Phase 1 of the park was about 100,000 square feet and the just started Phase 2 will take it up to 1.5 million-plus sq ft.

"We have just signed an agreement with Robert Bosch Engineering and Business Solutions to set up a research centre to address data sciences and artificial intelligence. Tata Steel is also just coming on board after signing an MoU (memorandum of understanding) with us last year to start an advanced materials research centre. There are several other companies as well that are setting up their niche labs here," said Balasubramanian.

Among the companies that already have a presence in the park are Saint Gobain, TCS, Amade, HERTL and Caterpillar.

A marketing team is in place to get more companies on board. "We have created two offices: development office and industrial relations office, and populated it with people with 10-25 years of experience in industry. These people are the go-between between the clients and the faculty to communicate exactly what the former expect," said Balasubramanian.



ANUSH BORA

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— DEEPA ALEXANDER

When Booker nominated author Allan Sealy speaks of inhabiting two worlds — the tree-filled, mist-laden town of Dehradun and the low-in-time, sandstone courtyards of Fatehpur Sikri — it is as if he speaks of his own Anglo-Indian heritage.

For come to IIT-Madras armed with questions in time with the workshop on Anglo-Indian Studies organised by its Department of Humanities and Social Sciences, New Zealand India Research Institute, and Anglo-Ind. Chennai. But the conversation transcends beyond the human legacy of colonisation in the subcontinent and the slowly vanishing world of Anglo-India.

In a soft, measured voice that was once heard at Calcutta's Victoria, Sealy looks at his past beyond writing. "I did play the guitar and sing in my dim, distant past," laughs Sealy. This was decades before he published *Zelaldins* — the jacket designed by Canadian artist Meera Sethi has a magical character in smokes carrying a ghetto blaster on his shoulder, and a bio that describes the author as "aspirated to a bricklayer".

"I built my home in Dehradun," says Sealy, who learnt from a bricklayer for 20 years. "The answer where I live is the work of this man and me. It is a passion, not just a need. When I'm tired of sitting at my desk, I do it overwork. The pleasure of that is indescribable."

With the Raj connections and beautiful buildings, Deon is where Sealy's father, who had served with the UP fo-



live, settled. "My parents were from Alhabad, the city I was born in. They moved to Australia, lasted a year and moved back to Deon, to this house, where I garden, bake my bread and write."

More than home

but the city of his heart is Lucknow, where Sealy went to La Martinière, a boarding school founded by a French soldier of fortune in India, but not in India. It is also the setting for his first novel, *The Frigate-birds*, a seven-generation saga of an Anglo-Indian family's fortunes and failures. "The hero of that book is the city of Lucknow," says Sealy, who spent considerable time tracing his own history. "My family's goes as far back as the 18th Century; up to 1986, the

documentation is sure. The first Sealy — two British brothers, John and Charles, one a sea captain, the other a member of the Bengal judiciary — arrived in the 1770s, and the family could have descended from either one of them, who had an informal union with a 'lapp' woman."

This need for roots or the lack of them has propelled the Anglo-Indian community to be in constant motion, driving it to migrate across the globe. Sealy was among them. "I grew up in small town UP, and lived abroad for 20 years, before I settled down in Deon," says Sealy, who graduated in English Literature from St Stephen's, with a passion that is at the heart of his Indian writing in English — Amitav Ghosh and Shashi Tharoor, among others. Sealy, who completed his doctoral thesis on the West Indian writer Wilson Harris, travelled across the US, and this became the subject of his book *From Thoreau to Houston*.

Soon other books followed — *Flora*, a fable, the Booker-nominated *The Evening Star*, a calendar, and *The Amalgamated Bed*, an fiction. "Each individual project seems to have its own logic, and I

don't impose a pattern. It is entirely possible that this discontinuous mode of narrative is part of my culture and heritage," says Sealy, adding that the place of the Anglo-Indian in India has changed irrevocably. "When I started out in La Martinière, they were in the majority. By the time I left, they were in the minority. The post-1947 migration was one of flight, the one in the 1960s was of economic opportunity, the same things that drive people that are not Anglo-Indians."

Beyond identity

"I don't write consciously as an Anglo-Indian, but if I produce an Anglo-Indian character, it's because I understand him from the inside. Percy in *Zelaldins*, is Anglo-Indian," says Sealy, of the book of verse that was born of an obsession for Fatehpur Sikri. "The title is from the Latin name given to Jhalaludin Akbar by the Jesuit priests at his court in the letters they wrote to Rome. It is the story of Percy, a man with a lover in Pakistan, who goes to Sikri and meets the ghost of Akbar, and they talk of the India of now. I'm grateful to the late writer D'Souza who reviewed it."

Sealy claims he is no Tolkien, who churns out thousands of pages of measured prose. "There are lots of unfinished projects, among them a comic book version of the India of today, set on the Nepal border, with a geologist who's looking at it."

And, alongside betraying that to life, Sealy will continue to straddle many worlds, stepping only to take breath.



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This need for roots or the lack of them has propelled the Anglo-Indian community to be in constant motion, driving it to migrate across the globe. Sealy was among them. "I grew up in small town UP, and lived abroad for 20 years, before I settled down in Deen," says Sealy, who graduated in English Literature from St Stephen's, with a passion that is at the heart of his Indian writing in English — Amitav Ghosh and Shashi Tharoor, among others. Sealy, who completed his doctoral thesis on the West Indian writer Wilson Harris, travelled across the US, and this became the subject of his book *From Thoreau to Houston*.

Soon other books followed — *Here*, a fable, the Booker-nominated *The Evening Star*, a calendar, and *The Amalgamated Book*, an fiction. "Each individual project seems to have its own logic, and I

don't impose a pattern. It is entirely possible that this discontinuous mode of narrative is part of my culture and heritage," says Sealy, adding that the place of the Anglo-Indian in India has changed irrevocably. "When I started out in La Martinière, they were in the majority. By the time I left, they were in the minority. The post-1947 migration was one of flight, the one in the 1960s was of economic opportunity, the same things that drive people that are not Anglo-Indians."

**Beyond identity**

"I don't write consciously as an Anglo-Indian, but if I produce an Anglo-Indian character, it's because I understand him from the inside. Percy in *Zelaldinus*, is Anglo-Indian," says Sealy, of the book of verse that was born of an obsession for Fatehpur Sikri. "The title is from the Latin name given to Jhalaludin Akbar by the Jesuit priests at his court in the letters they wrote to Rome. It is the story of Percy, a man with a lover in Pakistan, who goes to Sikri and meets the ghost of Akbar, and they talk of the India of now. I'm grateful to the late writer D'Souza who reviewed it."

Sealy claims he is no Tolkien, who churns out thousands of pages of measured prose. "There are lots of unfinished projects, among them a comic book version of the India of today, set on the Nepal border, with a geologist who's looking at it."

And, alongside betraying that to life, Sealy will continue to straddle many worlds, stepping only to take breath.



Date: 21st August 2017

Publication: The Hindu

Edition: Delhi/Chennai/Bangalore/Hyderabad/Mumbai

Page no.: 4

Journalist: Spatika Narayanan

Professor: Prof. Umakant Dash

Alumni/Students: Ashraya Maria, Sannihit & Avinaash R

**Headline: A liberal dose of the arts**

URL: <http://www.thehindu.com/education/a-liberal-dose-of-the-arts/article19523558.ece>

**COURSES**

## A liberal dose of the arts

IT Madras' M.A. programme exposes students to almost every sub-discipline of humanities

SPATIKA NARAYANAN



**Outreach:** Gaining invaluable experience.

With the study of liberal arts picking up steam around the country, and the sheer variety of options open to those who pursue these disciplines, it pays to understand the nuances of IIT Madras' flagship humanities programme, the integrated M.A. in Development Studies (DS) or English Studies (ES).

The current head of the department, Dr. Umakant Dash, has been with the department since 2004. Though the M.A. was initially conceptualised to prepare students for the Civil Services Examination (CSE) and careers in academic and policy research, it has also successfully sent students for higher studies abroad, to IIMs, consulting firms such as KPMG, investment banks, and NGOs. While other IITs at Kanpur, Kharagpur and Mumbai offer economics programmes, the entry-point for these is JEE. IITM is the only one to have a dedicated examination for their M.A. programme.

Umakant says, "The moment you make students take the JEE, you're restricting the programme to science students. Students from arts and commerce wouldn't be eligible — there are lots of deserving students from these branches. We wanted to include any Class XII graduate, so we didn't miss out on good students, and can give them the best platform possible."

Since its first year in 2007, the number of HSEE examinees has been steadily increasing, with coaching centres emerging for to prepare for this selective entrance test. According to Umakant, around 2,300 students wrote the exam last year — but only 45 students are selected for each intake. Ashraya Maria M.F., III, Development Studies urges, "It is good to read the papers every day and stay updated with what's going on. If you have a strong base in English and mathematics, up to Class X, that helps," Sammit, V, Development Studies adds, "I strongly recommend reading the opinion and editorial columns in newspapers. Also, you need to have basic knowledge about almost any topic."

One question that comes up repeatedly, is why economics isn't offered as a separate major, as it once was, when the programme was first introduced a decade ago. Umakant fills in the gaps. "Our main goal when we started was to offer an inter-disciplinary programme, that's why we decided to give more emphasis to DS. In any case, 50% of the courses are economics-based. Also, at that point of time, we had less number of faculty available for economics. So, it was temporarily halted as a major, though DS, ES and economics can still be taken as minors."

However, with a curriculum restructuring on the horizon, work for potentially reintroducing economics as a major is under way. There has been significant demand for this major, and many queries from students, parents and alumni.

**Minors**

For engineering students with a penchant for the social sciences, the department offers about 30 courses that can be taken up as electives. Similarly, the M.A. students can take engineering courses such as sustainable development. They have the option of minoring in general management or operations management offered by the management department, besides their department's own minors. IITM's placement and internship cells cater to all of the institution's students — whichever companies come to recruit the B. Tech students, also recruit the M.A. students, if the job scope fits.

What makes this programme different from the usual path of three years B.A. and a two-year M.A. is "If you take any university's curriculum, you will see that in their postgraduate syllabi, they repeat all the courses done in the undergraduate years. They provide depth, but the breadth is about the same as the first degree. So here, by integrating the degrees, we try to avoid repetition of the courses, and offer better breadth. But it's not the case that we neglect depth," explains Umakant.

For the students, this proves invaluable. "This programme gives you exposure to a lot of different fields and perspectives, which you would miss out on if you were just concentrating on one discipline," says Ashraya. Students study a variety of social science subjects during the first two years. They decide between ES and DS in their third semester, and are allotted majors according to their prior performance, as well as their personal preferences — the class is split into two, with 23 seats available for each. However, even in the third and fourth years, several of the two majors' courses are the same, save about 10-15 core courses.

First-year students are assigned a faculty advisor who guides them throughout their five-year stay. Students can go to partner universities in Germany or Denmark for exchange in their third year. Though internships aren't mandatory, almost all students complete around two or three during their time in the programme. For Avinaash R., III, Development Studies, the best part of the programme is interacting with the professors. "They are amazing individuals from very strong academic backgrounds, have in-depth knowledge and never fail to inspire you," he says.

Date: 29th August 2017

Publication: Citizen Matters

Edition: Online

Journalist: NA

Alumni/student: Varun Jain

**Headline: Snapshots from IIT Madras, beyond the academics!**

URL: <http://chennai.citizenmatters.in/iit-madras-chennai-ecosystem-photo-feature-2596>

### Snapshots from IIT Madras, beyond the academics!



For most people, a college campus is a place where you go through very routine activities of study and research. However, when I entered the IIT Madras campus, I was awestruck at the flora and fauna that greeted me. I learnt in the days post admission that the campus was located in the grounds of a national park which meant that I would get to see even some endangered species. This motivated me to photograph all that I could and share it with people I knew.

What started off as a pastime quickly turned into my passion, especially as I realized that images don't age. They are the perfect way to capture moments, especially those of creatures who cannot speak and are not as evolved as human beings, but whose actions nevertheless indicate a much deeper meaning.

Photography helps me see the things that I wouldn't normally notice. It also inspired me to bring to the notice of others all that existed around us, which is almost unique to the campus. From monkeys to blackbucks to the variety of birds and insects and also the wild flora, IIT-M boasts of glorious variety, but these creatures go unnoticed while thousands slog within the concrete walls of classrooms.



Photography has given me an opportunity to create a platform for all these creatures. Here are a few photos that give you a sneak peek into the ecosystem that the Institute is:



**The sun breaks through the trees in a quiet corner of the campus**



**The albino blackbuck, the only one of its kind on campus, stands tall and proud**



**A truly reflective moment..**



**No need for words here..**



**Morning Walk on one of the main avenues**



**Checking out the hallways**



Oh! to be young and free!



Curiosity!



Nothing like water on a hot summer day!



Deep thought



Let's go for a ride!



Zooming into a hidden world



Checking out the hostel



All for love

**IIT Madras is an industry friendly  
Institute**



Date: 5th August 2017

Publication: The Times of India

Edition: Online

Journalist: Ranjani Ayyar

Professor: Prof. Bhaskar Ramamurthi

**Headline: Data science and artificial intelligence research centre to be set up in IIT-Madras**

URL: <http://timesofindia.indiatimes.com/city/chennai/data-science-and-artificial-intelligence-research-centre-to-be-set-up-in-iit-madras-/articleshow/59913795.cms>

### **Data science and artificial intelligence research centre to be set up in IIT-Madras**

CHENNAI: Robert Bosch Engineering and Business Solutions (RBEI) signed a memorandum of understanding (MoU) with the Indian Institute of Technology Madras (IIT Madras) on Friday to set up the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI).

The mission of the RBC-DSAI is to create societal impact through multidisciplinary interactions with government, academic, research and industrial collaborators on core challenges in Data Science (DS) and Artificial Intelligence (AI). The Centre will receive Rs 3 crore - Rs 4 crore funding per year for five years.

Vijay Ratnaparkhe, MD, Robert Bosch, said, "This partnership is to accelerate research for societal impact, taking a long-term view. It will set a precedent in the way big-data is used to improve our problem solving capability in industry. At the same time, the collaboration will result in shared outcomes for the benefit of society."

Bhaskar Ramamurthi, director, IIT-M said, "IIT-Madras has been nurturing its interdisciplinary data sciences and artificial intelligence research group for more than three years now. The launch of this centre in partnership with, and generous support from, RBEI is an affirmation of the rapid growth and impact of the group's research and teaching activities. I am confident that the RBC-DSAI will become a globally acknowledged centre working at the cutting edge of various aspects of machine learning, data science and artificial intelligence, leading to work with high social impact."

The Robert Bosch Centre will undertake foundational research in many areas of AI and data science -- deep learning, reinforcement learning, network analytics, interpretable machine learning, and domain aware AI.

The areas of activity include research projects, knowledge management and dissemination, developing prototypes, outreach projects and setting up collaborative facilities and laboratories among others.

The centre's mandate requires interaction with industry and other universities, including international student and faculty exchanges. The objective is to advance scientific innovation for societal benefit.

Several technologies currently require large datasets to improve their accuracy and to adapt these technologies for the Indian context.

As part of Bosch's research and innovation portfolio in India, the centre in IIT-M will become part of a network to support 'Digital India.' It will advance the country in the fields of innovation and research as the world moves towards more connected hardware and software products.

This research network also includes the Robert Bosch Centre for Cyber Physical Systems at the Indian Institute of Science (IISc), Bangalore.

Date: 5th August 2017

Publication: The Hindu Business Line

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: RBEI signs MoU with IIT-M**

URL: <http://www.thehindubusinessline.com/news/education/rbei-signs-mou-with-iitm/article9802588.ece>

### **RBEI signs MoU with IIT-M**

CHENNAI, AUG 4: Robert Bosch Engineering and Business Solutions (RBEI) and IIT, Madras today signed a Memorandum of Understanding for establishing a Centre for Data Science and Artificial Intelligence.

Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI) will undertake foundational research in areas of AI and Data Science like deep learning, network analytics, reinforcement learning and interpretable machine learning, a release from IIT-M said.

“The areas of activity include research projects, knowledge management and dissemination, developing prototypes, outreach projects and setting up collaborative facilities and laboratories, among others,” it said.

The objective of this centre in IIT-M “is to advance scientific innovation for societal benefit,” it added.

Vijay Ratnaparkhe, Managing Director, RBEI, was quoted as saying that the partnership with IIT-M will “set a precedent in the way big-data is used to improve our problem solving capability in industry.”

Director of the technical institute, Bhaskar Ramamurthi said IIT Madras had been nurturing its interdisciplinary Data Sciences and Artificial Intelligence research group for more than three years now.

The launch of the Centre in partnership with RBEI was an affirmation of the rapid growth and impact of the group’s research and teaching activities, he added.

Date: 5th August 2017

Publication: Web India 123

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: RBEI signs MoU with IIT-M for foundational research in Data Science, AI**

URL: <https://news.webindia123.com/news/articles/india/20170804/3162182.html>

### **RBEI signs MoU with IIT-M for foundational research in Data Science, AI**

Robert Bosch Engineering and Business Solutions (RBEI) today signed a Memorandum of Understanding (MoU) today with the Indian Institute of Technology, Madras (IIT-M) to set up a researchfoundational research for Data Science and Artificial Intelligence (DSAI).

The mission of the DSAI was to create societal impact through multi-disciplinary interactions with government, academic, research and industrial collaborators on core challenges in Data Science (DS) and Artificial Intelligence (AI).

The Centre will receive funding up to Rs three to four crores per year for five years.

After signingthe MoU, Robert Bosch Managing Director VijayRatnaparkhe and IIT-MDirector Prof Bhaskar Ramamurthi pointed out the significance of this collaboration in the global research and innovation landscape.

Mr Vijay said "this partnership is to accelerate research for societal impact, taking a long-term view. It will set a precedent in the way bigdata is used to improve our problem solving capability in industry".

"At the same time the collaboration will result in shared outcomes for the benefit of society", he added.

MORE UNI GV CS 1549

Date: 5th August 2017

Publication: The Times of India

Edition: Chennai

Page no.: 3

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

Headline: Data science and AI lab set up at IIT Madras

URL: <http://timesofindia.indiatimes.com/city/chennai/data-science-and-ai-lab-set-up-at-iit-m/articleshow/59921624.cms>

# Data science & AI lab set up at IIT-M

## MoU Signed Between IIT-M & RBEI

TIMES NEWS NETWORK

Chennai: Artificial intelligence (AI), the 'Next Big Thing', is here.

Silicon Valley may be at the forefront of research in the field, but a new development in the country could help speed up research in AI and data science: Robert Bosch Engineering and Business Solutions (RBEI) and IIT Madras signed an MoU on

### FOR A SMARTER FUTURE

**Founders & Researchers**  
Allen Newell,  
Herbert  
Simon, John  
McCarthy,  
Marvin  
Minsky and  
Arthur  
Samuel

**What is AI** | Field that works on creation of intelligent machines that work and react like human beings

**History** | It is said to have been born at a workshop in Dartmouth College in 1956

**Why gaining prominence** | AI can help in identifying patterns in the data more efficiently than humans, enabling businesses to gain more insight out of their data

Friday to set up the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI) in the city.

RBC-DSAI intends to create an impact on society via multidisciplinary interactions with government, academic, research and industri-

al collaborators on core data science and AI challenges. The centre will receive up to ₹4 crore a year for five years.

"This partnership is to accelerate research for societal impact, taking a long term view," Robert Bosch, India, MD Vijay Ratnaparkhe said.

"It will set a precedent in the way big data is used to improve industrial problem solving. [It] will result in shared outcomes for the benefit of society."

IIT-M director Bhaskar Ramamurthi the institute had been nurturing its interdisciplinary data sciences and artificial intelligence research group for more than three years.

"The launch of this centre in partnership with RBEI is an affirmation of the rapid growth of the group's research and teaching activities," he said.

"I am confident that the RBC-DSAI will become a globally acknowledged cen-

tre at the cutting edge of machine learning and AI, leading to work with high social impact," Ramamurthi said.

The centre will undertake research in multiple areas of AI and data science — deep learning, reinforcement learning, network analytics, interpretable machine learning, and domain aware AI.

The centre in IIT-M will be part of a network to support 'Digital India', intended to help the country advance in the fields of innovation and research.

This research network includes the Robert Bosch Centre for Cyber Physical Systems at the Indian Institute of Science (IISc), Bangalore.

Date: 5th August 2017

Publication: Millennium Post

Edition: Online

Journalist: NA

**Headline: Robert Bosch, IIT-M to form data science and AI centre**

URL: <http://www.millenniumpost.in/business/robert-bosch-iit-m-to-form-data-science-and-ai-centre-256037>

### **Robert Bosch, IIT-M to form data science and AI centre**

Robert Bosch Engineering and Business Solutions (RBEI) and IIT, Madras on Friday signed a Memorandum of Understanding for establishing a Centre for Data Science and Artificial Intelligence. Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI) will undertake foundational research in areas of AI and Data Science like deep learning, network analytics, reinforcement learning and interpretable machine learning, a release from IIT-M said.

"The areas of activity include research projects, knowledge management and dissemination, developing prototypes, outreach projects and setting up collaborative facilities and laboratories, among others," it said. The objective of this centre in IIT-M "is to advance scientific innovation for societal benefit," it added. Vijay Ratnaparkhe, Managing Director, RBEI, was quoted as saying that the partnership with IIT-M will "set a precedent in the way big-data is used to improve our problem solving capability in industry."

Date: 5th August 2017

Publication: Deccan Chronicle

Edition: Chennai

Page no.: 2

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: AI: IIT Madras signs MoU with Bosch**

URL: <http://www.deccanchronicle.com/nation/current-affairs/050817/artificial-intelligence-iit-madras-signs-mou-with-bosch.html>

## AI: IIT-M signs MoU with Bosch

DC CORRESPONDENT  
CHENNAI, AUG. 4

Taking basic and applied research to next level, IIT Madras plans to set up a research centre to focus on data sciences and artificial intelligence.

It has entered a memorandum of understanding with Robert Bosch Engineering and Business Solutions to set up Robert Bosch Centre for Data Science and Artificial Intelligence. The centre will receive funds up to ₹4 crores per year, for five years.

The centre will undertake research in deep learning, reinforcement learning, network analytics, interpretable machine learning.

Vijay Ratnaparkhe, managing director of Robert Bosch said, "It will set a precedent in the way big data is used to improve our problem-solving capability in the industry. At the same time, the collaboration will result in shared outcomes for the benefit of society."

Bhaskar Ramamurthi, director, IIT Madras, said, "We have been nurturing its interdisciplinary data sciences and artificial intelligence research group for more than three years now."

"There are basic issues in the way we collect and share data; these need to be solved in a collective and open sourced manner. To address this issue, the centre is setting out on an ambitious task of creating a portal of curated, India specific data sets that are easy to access and interpret through a set of open tools and interfaces," IIT Madras said in a release.

Date: 5th August 2017

Publication: Business Standard

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi

**Headline: RBEI signs MoU with IIT-M**

URL: [http://www.business-standard.com/article/pti-stories/rbei-signs-mou-with-iit-m-117080401015\\_1.html](http://www.business-standard.com/article/pti-stories/rbei-signs-mou-with-iit-m-117080401015_1.html)

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"The areas of activity include research projects, knowledge management and dissemination, developing prototypes, outreach projects and setting up collaborative facilities and laboratories, among others," it said.

The objective of this centre in IIT-M "is to advance scientific innovation for societal benefit," it added.

Vijay Ratnaparkhe, Managing Director, RBEI, was quoted as saying that the partnership with IIT-M will "set a precedent in the way big-data is used to improve our problem solving capability in industry."

Director of the technical institute, Bhaskar Ramamurthi said IIT Madras had been nurturing its interdisciplinary Data Sciences and Artificial Intelligence research group for more than three years now.

The launch of the Centre in partnership with RBEI was an affirmation of the rapid growth and impact of the group's research and teaching activities, he added.



Date: 5th August 2017

Publication: India.com

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi

**Headline: RBEI signs MoU with IIT-M**

URL: <http://www.india.com/news/agencies/rbei-signs-mou-with-iit-m-2378443/>

### **RBEI signs MoU with IIT-M**

Chennai, Aug 4 (PTI) Robert Bosch Engineering and Business Solutions (RBEI) and IIT, Madras today signed a Memorandum of Understanding for establishing a Centre for Data Science and Artificial Intelligence.

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The launch of the Centre in partnership with RBEI was an affirmation of the rapid growth and impact of the group’s research and teaching activities, he added.

Date: 5th August 2017

Publication: Careers 360

Edition: Online

Journalist: Harshita Das

Professor: Prof. Bhaskar Ramamurthi

**Headline: IIT Madras, REBI collaborate to set up research centre for data science and artificial intelligence**

URL: <https://engineering.careers360.com/articles/iit-madras-rebi-collaborate-set-research-centre-for-data-science-and-artificial>

### **IIT Madras, REBI collaborate to set up research centre for data science and artificial intelligence**

Robert Bosch Engineering and Business Solutions (RBEI) signed a Memorandum of Understanding (MoU) on August 04, 2017 with the Indian Institute of Technology Madras (IIT Madras) to set up the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI). The mission of the RBC-DSAI is to create societal impact through multidisciplinary interactions with government, academic, research and industrial collaborators on core challenges in Data Science (DS) and Artificial Intelligence (AI). The Centre will receive funding up to the tune of INR three to four crores annually, for five years.

The ceremony to mark the signing of the MoU was accompanied by key note addresses from the Managing Director of Robert Bosch, Vijay Ratnaparkhe and the Director of IIT Madras, Prof. Bhaskar Ramamurthi. Both pointed out the significance of this collaboration in the global research and innovation landscape. Ratnaparkhe said, "This partnership is to accelerate research for societal impact, taking a long-term view. It will set a precedent in the way big-data is used to improve our problem solving capability in industry. At the same time the collaboration will result in shared outcomes for the benefit of society".

Speaking about the upcoming Centre, Prof. Bhaskar Ramamurthi remarked, "IIT Madras has been nurturing its interdisciplinary Data Sciences and Artificial Intelligence research group for more than three years now. The launch of this Centre in partnership with, and generous support from, RBEI is an affirmation of the rapid growth and impact of the group's research and teaching activities. I am confident the RBC-DSAI will become a globally acknowledged Centre working at the cutting edge of various aspects of machine learning, data science and artificial intelligence, leading to work with high social impact."

The Robert Bosch Centre will undertake foundational research in many areas of AI and Data Science, namely, deep learning, reinforcement learning, network analytics, interpretable machine learning. The areas of activity includes research projects, knowledge management and dissemination, developing prototypes, outreach projects, and setting up collaborative facilities and laboratories among others. The Centre's mandate requires interaction with industry and other universities, including international student and faculty exchanges. The objective is to advance scientific innovation for societal benefit.

Several technologies currently require large data sets to improve their accuracy and to adapt these technologies for the Indian context. There are basic issues in the way we collect and share data; these need to be solved in a collective and open-sourced manner. To address this issue, the Centre is setting out

on an ambitious task of creating a portal of curated, India specific data sets that are easy to access and interpret through a set of open tools and interfaces.

As part of Bosch's research and innovation portfolio in India, the Centre in IIT-M will become part of a network to support 'Digital India'; it will advance the country in the fields of innovation and research as the world moves towards more connected hardware and software products. This research network also includes the Robert Bosch Centre for Cyber Physical Systems at the Indian Institute of Science (IISc.) in Bangalore.

Date: 6th August 2017

Publication: Kalvimalar

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: RBEI signs MoU with IIT-M**

URL: <http://kalvimalar.dinamalar.com/news-details.asp?id=25313&cat=1>

### **RBEI signs MoU with IIT-M**

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Director of the technical institute, Bhaskar Ramamurthi said IIT Madras had been nurturing its interdisciplinary Data Sciences and Artificial Intelligence research group for more than three years now.

The launch of the Centre in partnership with RBEI was an affirmation of the rapid growth and impact of the group's research and teaching activities, he added.

Date: 6th August 2017

Publication: The Hindu

Edition: Chennai

Page no.: 4

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: IIT-M signs pact for data science research centre**

URL: <http://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/iit-m-signs-pact-for-data-science-research-centre/article19437974.ece>

# IIT-M signs pact for data science research centre

**SPECIAL CORRESPONDENT**  
CHENNAI

The Indian Institute of Technology - Madras and the Robert Bosch Engineering and Business Solutions have entered into an agreement to set up a research centre for data science and artificial

intelligence (AI). The Robert Bosch Centre for Data Science and Artificial Intelligence Centre will receive ₹4 crore each year for a period of five years. The aim is to create societal impact through multidisciplinary interactions with govern-

ment, academic, research and industrial collaborators on core challenges in data science and AI.

Robert Bosch Managing Director Vijay Ratnaparkhe and Director of IIT Madras Bhaskar Ramamurthi signed the pact.

Date: 6th August 2017

Publication: UNI

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: RBEI signs MoU with IIT-M for foundational research in Data Science, AI**

URL: <http://www.uniindia.com/rbei-signs-mou-with-iit-m-for-foundational-research-in-data-science-ai/states/news/950674.html#Tomw4Tm8waHZPKkO.99>

### **RBEI signs MoU with IIT-M for foundational research in Data Science, AI**

Chennai, Aug 4 (UNI) Robert Bosch Engineering and Business Solutions (RBEI) today signed a Memorandum of Understanding (MoU) today with the Indian Institute of Technology, Madras (IIT-M) to set up a research foundational research for Data Science and Artificial Intelligence (DSAI).

The mission of the DSAI was to create societal impact through multi-disciplinary interactions with government, academic, research and industrial collaborators on core challenges in Data Science (DS) and Artificial Intelligence (AI).

The Centre will receive funding up to Rs three to four crores per year for five years.

After signing the MoU, Robert Bosch Managing Director Vijay Ratnaparkhe and IIT-M Director Prof Bhaskar Ramamurthi pointed out the significance of this collaboration in the global research and innovation landscape.

Mr Vijay said "this partnership is to accelerate research for societal impact, taking a long-term view. It will set a precedent in the way big data is used to improve our problem solving capability in industry".

"At the same time the collaboration will result in shared outcomes for the benefit of society", he added.

Date: 6th August 2017

Publication: India Education Diary

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Robert Bosch Engineering and Business Solutions and Indian Institute of Technology Madras to set up research centre to address data sciences and artificial intelligence**

URL: <http://indiaeducationdiary.in/robert-bosch-engineering-business-solutions-indian-institute-technology-madras-set-research-centre-address-data-sciences-artificial-intelligence/>

**Robert Bosch Engineering and Business Solutions and Indian Institute of Technology Madras to set up research centre to address data sciences and artificial intelligence**

Chennai: Robert Bosch Engineering and Business Solutions (RBEI) signed a Memorandum of Understanding (MoU) today with the Indian Institute of Technology Madras (IIT Madras) to set up the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI). The mission of the RBC-DSAI is to create societal impact through multidisciplinary interactions with government, academic, research and industrial collaborators on core challenges in Data Science (DS) and Artificial Intelligence (AI). The Centre will receive funding up to the tune of INR three to four crores per year, for five years.

The ceremony to mark the signing of the MOU was accompanied by key note addresses from the Managing Director of Robert Bosch, Mr. Vijay Ratnaparkhe and the Director of IIT Madras, Prof. Bhaskar Ramamurthi. Both pointed out the significance of this collaboration in the global research and innovation landscape. Mr. Vijay Ratnaparkhe said, "This partnership is to accelerate research for societal impact, taking a long-term view. It will set a precedent in the way big-data is used to improve our problem solving capability in industry. At the same time the collaboration will result in shared outcomes for the benefit of society".

Speaking about the upcoming Centre, Prof. Bhaskar Ramamurthi remarked, "IIT Madras has been nurturing its interdisciplinary Data Sciences and Artificial Intelligence research group for more than three years now. The launch of this Centre in partnership with, and generous support from, RBEI is an affirmation of the rapid growth and impact of the group's research and teaching activities. I am confident the RBC-DSAI will become a globally acknowledged Centre working at the cutting edge of various aspects of machine learning, data science and artificial intelligence, leading to work with high social impact."

The Robert Bosch Centre will undertake foundational research in many areas of AI and Data Science, namely, deep learning, reinforcement learning, network analytics, interpretable machine learning, and domain aware AI. The areas of activity includes research projects, knowledge management and dissemination, developing prototypes, outreach projects, and setting up collaborative facilities and laboratories among others. The Centre's mandate requires interaction with industry and other universities, including international student and faculty exchanges. The objective is to advance scientific innovation for societal benefit.

Several technologies currently require large datasets to improve their accuracy and to adapt these technologies for the Indian context. There are basic issues in the way we collect and share data; these need to be solved in a collective and open-sourced manner. To address this issue, the Centre is setting out on an ambitious task of creating a portal of curated, India specific data sets that are easy to access and interpret through a set of open tools and interfaces.

As part of Bosch's research and innovation portfolio in India, the Centre in IIT-M will become part of a network to support 'Digital India'; it will advance the country in the fields of innovation and research as the world moves towards more connected hardware and software products. This research network also includes the Robert Bosch Centre for Cyber Physical Systems at the Indian Institute of Science (IISc) in Bangalore. Bosch believes that the world of business can make a major contribution to solving the challenges society faces.



Date: 6th August 2017

Publication: The Times of India

Edition: Chennai

Page no.: 5

Journalist: NA

**Headline: IIT-M to train engineers recruited for metro rail**

URL: <http://timesofindia.indiatimes.com/city/chennai/iit-m-trains-metro-rail-engineers-cmrl-trains-engineering-students/articleshow/59935518.cms>

## IIT-M to train engineers recruited for metro rail

TIMES NEWS NETWORK

**Chennai:** Even as the city's metro rail network is set to expand with phase-2 of the project, Chennai Metro Rail Limited (CMRL) is preparing to provide specialised training to its new recruits and train future engineers on the industry knowhow.

A team of 15 engineers, selected by CMRL, will be trained at IIT Madras starting from August 2017 before being inducted. Metro rail has also

started in-plant training for engineering students on the tender and bidding process.

Officials said 15 civil engineering graduates recruited for the post of executive trainee (civil) will take up a PG diploma course in metro rail technology and management for a year. While the course is sponsored by CMRL, candidates will be trained by IIT-M professors.

The programme, which was first launched in 2012, was suspended for two years before

it was revived this academic year.

"Metro technology is quite different from railway technology. There is a lot of automation. Most of the operations are through software. Freshers will not be able to handle work directly. They need specialised training to be employed," said a railway official.

Simultaneously, CMRL is providing in-plant training for engineering students on the nuances in the industry, particularly the process of inviting

tenders and bidding. Engineers, despite their technical expertise, are expected to take up administrative tasks like inviting bids in public sector undertakings. Students from six colleges participated in the training classes conducted by CMRL recently.

For the diploma course, CMRL signed an MoU with IIT-M to frame a specialised curriculum and train the candidates. Metro rail officials said while they have enough manpower for phase-1 of the

project, such recruitment and training is timely as CMRL has begun work for phase-2 which covers 107km, more than double the distance covered by phase-1. Further, phase-2 will be predominantly underground.

The curriculum was framed in consultation with CMRL and is tailor made to suit the requirements of the project, which may include designing and construction of columns and stations for elevated corridors as well as tunnels.

Date: 6th August 2017

Publication: The Hindu- Tamil

Edition: Chennai

Page no.: 4

Journalist: Lisbon Kumar

Professor: Prof. Bhaskar Ramamurthi

Headline: Data Science, AI centre coming up at IIT-Madras at a cost of Rs. 15 cr

URL: <http://tamil.thehindu.com/tamilnadu/article19432871.ece>

சென்னை ஐஐடி-யில்

## ரூ.15 கோடியில் தரவு, செயற்கை நுண்ணறிவு ஆய்வு மையம் அமைகிறது

● ஜெர்மனி நிறுவனத்துடன் புரிந்துணர்வு ஒப்பந்தம்

சென்னை ஐஐடி-யில் சுமார் ரூ.15 கோடி செலவில் தரவு மற்றும் செயற்கை நுண்ணறிவு ஆராய்ச்சி மையம் அமைக்கப்பட உள்ளது. இதொடர்பாக ஜெர்மனி நிறுவனத்துடன் ஐஐடி நேற்று புரிந்துணர்வு ஒப்பந்தம் செய்யப்பட்டுள்ளது.

ராபர்ட் போஸ் இன்ஜினியரிங் மற்றும் பிசினஸ் சொல்யூஷன்ஸ் என்ற ஜெர்மனி நிறுவனத்தின் நிதியுதவியுடன் சென்னை கிண்டியில் உள்ள ஐஐடி வளாகத்தில் ஏறத்தாழ ரூ.15 கோடி செலவில் தரவு மற்றும் செயற்கை நுண்ணறிவு ஆராய்ச்சி மையம் (Research Centre on Data Sciences and Artificial Intelligence) நிறுவப்பட உள்ளது. இதுதொடர்பான புரிந்துணர்வு ஒப்பந்தம் நேற்று கையெழுத்தானது.

இந்த ஒப்பந்தத்தில் ஐஐடி இயக்குநர் பாஸ்கர் ராமமூர்த்தியும், ராபர்ட் போஸ் இன்ஜினியரிங் நிறுவனத்தின் நிர்வாக இயக்குநர் விஜய் ரத்னபார்க்கேவும் கையெழுத்திட்டு ஒப்பந்த ஆவணங்களை பரிமாறிக் கொண்டனர். இந்த ஒப்பந்தத்தின்



படி, புதிதாக அமைக்கப்படும் ஆராய்ச்சி மையத்துக்கு ராபர்ட் போஸ் நிறுவனம் ஆண்டுக்கு ரூ.3 கோடி முதல் ரூ.4 கோடி வரை தொடர்ந்து 5 ஆண்டுகளுக்கு வழங்கும். இந்த ஆய்வு மையம் மூலம் தரவுகள் பாதுகாப்பு மற்றும் பயன்பாடு குறித்தும், ரொபாட்டிக்ஸ் சம்பந்தப்பட்ட செயற்கை நுண்ணறிவுத் துறை குறித்தும் கூட்டு ஆராய்ச்சி மேற்கொள்ளப்படும் என்று ஐஐடி இயக்குநர் பாஸ்கர் ராமமூர்த்தி தெரிவித்துள்ளார்.

▲ சென்னை ஐஐடியில் தரவு மற்றும் செயற்கை நுண்ணறிவு ஆராய்ச்சி மையம் அமைப்பது தொடர்பான புரிந்துணர்வு ஒப்பந்த ஆவணங்களை ஐஐடி இயக்குநர் பாஸ்கர் ராமமூர்த்தியும், ராபர்ட் போஸ் இன்ஜினியரிங் மற்றும் பிசினஸ் சொல்யூஷன்ஸ் நிறுவனத்தின் நிர்வாக இயக்குநர் விஜய் ரத்னபார்க்கேவும் பரிமாறிக் கொண்டனர். நடுவில் போஸ் நிறுவனத்தின் முதுநிலை மேலாளர் சிஜேதீரன் வெங்கோபரன் உள்ளார்.

Date: 7th August 2017

Publication: DT Next

Edition: Chennai

Page no.: 4

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: IIT-M, Robert Bosche Engg sign MOU on AI, Data science**

URL: <http://www.dtnext.in/News/City/2017/08/07005532/1040933/IITM-Robert-Bosche-Engg-sign-MOU-on-AI-Data-science.vpf>

# IIT-M, ROBERT BOSCHE ENGG SIGN MOU ON AI, DATA SCIENCE

**CHENNAI:** Artificial Intelligence (AI) is the talk of the town. So much so that tech icons like Elon Musk and Mark Zuckerberg are having open spats about it. While Tesla chief is worried about the apocalyptic future of AI, Zuckerberg calls it the future. Like it or not, technology giants are investing in the possibility of AI and Indian institutions are providing opportunities to students to understand the technology.

For instance, Robert Bosch Engineering and Business Solutions (RBEBS) signed a Memorandum of Understanding (MoU) recently with the Indian Institute of Technology Madras (IIT Madras), to set up the Robert Bosch Centre for Data Science and Artificial Intelligence (RBC-DSAI). According to a press release, the mission of RBC-DSAI is to create societal

impact, through multidisciplinary interactions with government, academic, research and industrial collaborators, on core challenges in Data Science (DS) and AI. The Centre will receive funding up to the tune of Rs three to four crore per year, for five years.

Vijay Ratnaparkhe, Managing Director of Robert Bosch said, "This partnership is to accelerate research for societal impact, taking a long-term view. It will set a precedent in the way Big Data is used to improve our problem-solving capability in industry. At the same time, the collaboration will result in shared outcomes for the benefit of society."

Speaking about the upcoming Centre, Prof Bhaskar Ramamurthi said, "IIT Madras has been nurturing its interdisciplinary Data Sciences and Artificial



**Vijay Ratnaparkhe, MD, Robert Bosch, hands over the ceremonial cheque to Bhaskar Ramamurthi, Director, IIT-M**

Intelligence research group for more than three years now. The launch of this Centre in partnership with, and generous support from, RBEBS is an affirmation of

the rapid growth and impact of the group's research and teaching activities. I am confident that RBC-DSAI will become a globally acknowledged Centre, working

on the cutting edge of various aspects of machine learning, Data Science and AI, leading to work with high social impact."

The Robert Bosch Centre will undertake foundational research in many areas of AI and Data Science, namely, deep learning, reinforcement learning, network analytics, interpretable machine learning, and domain-aware AI. The fields of activities include research projects, knowledge management and dissemination, developing prototypes, outreach projects, and setting up collaborative facilities and laboratories, among others. The Centre's mandate requires interaction with industry and other universities, including international student and faculty exchanges. The objective is to advance scientific innovation for societal benefit, said the press release.

Date: 12th August 2017

Publication: Chennai Patrika

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Tata Steel Advanced Materials Research Centre established at IIT Madras**

URL: <http://news.chennaipatrika.com/post/2017/08/11/Tata-Steel-Advanced-Materials-Research-Centre-established-at-IIT-Madras.aspx>

### **Tata Steel Advanced Materials Research Centre established at IIT Madras**

Chennai, 11 August 2017: The Tata Steel Advanced Materials Research Centre (TSAMRC) was launched today (11th August 2017) at Indian Institute of Technology Madras (IIT Madras) Research Park.

Mr Anand Sen, President (Total Quality Management and Steel Business), Tata Steel Limited, inaugurated the Centre in the presence of Prof. Bhaskar Ramamurthi, Director, IIT Madras, Dr Gopichand Katragadda, Group Chief Technology Officer, Tata Sons, Prof. Krishnan Balasubramanian, Dean, Industrial Consultancy and Sponsored Research, IIT Madras, faculty members and officials from IIT-Madras and Tata Steel Limited.

Speaking at the occasion, Mr Sen, said, "The best brains should be involved in innovation in manufacturing. There is a large space and need for innovation in the manufacturing sector and I'm looking forward to exciting times ahead."

This was a good start to an exciting venture. This Centre should be fully operational by December this year, he added.

Speaking during the inaugural function, Prof. Ramamurthi said, "We should be driving the technological innovations as there is a lot of potential for new technologies in the country. The Computational Software should be leveraged to see how an existing pathway, being followed globally, can be replaced by a better, more efficient and economical pathway. The Tata Steel Advanced Materials Research Centre will be equipped with computational software."

Speaking later, Dr Katragadda said, "Now, it takes nearly 20 years for a new material to be created and enter the market. The industry will benefit a lot, if this time can be reduced." The Computational Centre at TSAMRC will definitely help accelerate the timeline for a product to go to the market.

Tata Steel had signed a Memorandum of Understanding with IIT-Madras on August 16, 2016 to set up the Research Centre. This initiative comes in the light of Tata Steel being entrusted with the responsibility of developing a long-term strategic roadmap in the area of advanced materials.

It is intended to attract project proposals from IIT-Madras with potential breakthroughs using Advanced Materials and new processing techniques. The Centre also aspires to create a world-class ecosystem that would enable participation of leading universities from across the world. The students and faculty

members working on projects at TSAMRC would also be exposed to the manufacturing world of not only Tata Steel also with other group companies of Tata.

S. Ramaprabhu, Dept. of Physics, Prof. Susy Varughese, Dept. of Chemical Engineering, Prof. P. Abhijith Deshpande, Dept. of Chemical Engineering, Prof. C. Lakshman Rao, Dept. of Applied Mechanics, Prof. Debdutta Ray, Dept. of Electrical Engineering, and Prof. Soumya Dutta, Dept. of Electrical Engineering, were among the faculty from IIT-Madras who took part in the function.

Date: 12th August 2017

Publication: India Education Diary

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

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URL: <http://indiaeducationdiary.in/tata-steel-advanced-materials-research-centre-established-iit-madras/>

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Date: 12th August 2017

Publication: Skill Outlook

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Tata Steel Advanced Materials Research Centre established at IIT Madras**

URL: <http://skilloutlook.com/education/tata-steel-advanced-materials-research-centre-established-iit-madras>

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Date: 12th August 2017

Publication: The New Indian Express

Edition: Chennai

Page no.: 3

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Tata Steel study centre set up at IIT-Madras**

### **Tata Steel study centre set up at IIT-Madras**

Chennai: The Tata Steel advanced materials research centre was established at the Indian Institute of Technology on Friday. According to a release from the IIT-Madras, Anand Sen, president, Total Quality Management and Steel Business, Tata Steel Limited inaugurated the centre in the presence of professor Bhaskar Ramamurthi, Director, IIT-Madras.

ENS

Date: 17th August 2017

Publication: The Times of India

Edition: Chennai/Kochi

Page no.: 11

Journalist: Manash Pratim Gohain

Professor: Prof. R. Nagarajan

Alumni: Anand Rajaraman & Venky Harinarayanan

**Headline: IIT-Madras raises Rs 55 crore from alumni for research, infra**

URL: <http://timesofindia.indiatimes.com/city/delhi/iit-madras-raises-rs-55-crore-from-alumni-for-research-infra/articleshow/60095721.cms>

# IIT-M raises ₹55 crore from alumni for research, infra

Manash.Gohain  
@timesgroup.com

**New Delhi:** Indian Institute of Technology — Madras (IIT-M) has created a record of sorts by raising funds to the tune of ₹55 crore in the financial year of 2016-17.

The tech school has also managed to reverse an historic trend of 70% of the donors being from the US in the past. The majority of donors this year have been from India. The institute now aims at building a large unrestricted endowment fund to the tune of ₹500 crore by the year 2020.

According to IIT-M's "Annual Giving Report 2016", not only the total contribution has exceeded ₹55 crore for the first time, the receipts from India-based donors and corporates is 70%. The IIT has also managed crowd funding to the tune of ₹75 lakh via social media platform. The institute has also recorded a consistent increase in new donors — from 37 in 2009 to 1,827 in 2016.

The major contributions from the alumni have come for visiting and institute chairs, infrastructure, CSR projects, research projects, workshops and healthcare innovation.

According to professor R Nagarajan, dean of international and alumni relations, IIT-M, connecting with the alumni and corporates started in a structured manner in 2009. In eight years, the fund raising activity yielded signif-



**IN A FIRST:** The total contribution has exceeded ₹55 crore for the first time, according to the institute's Annual Giving Report 2016

icant growth — from ₹10 million in 2009 to ₹550 million in 2016.

Termining it as another watershed year for IIT-M, Nagarajan said: "Our alumni network and other linkages have been growing significantly in the last few years. In fact, the growth of contribution between 2015 and 2016 has been ₹7 crores. We started connecting with the alumni in 2009, build trust, reconnect them to their alma mater and convince them that their contribution will make a real difference."

Traditionally, alumni associations in India do not engage in fund raising. Their primary responsibility is to build the network. But IIT-M has successfully made the transition of tapping alumni for fund raising.

Taking a cue from the model practiced in the West, primarily from the US universities, IIT-M is now planning to raise ₹500 crores by 2020 as an

endowment, "which means the principal amount will remain intact and the income generated through interest will be used for developmental activities," added Nagarajan. IIT-M Foundation has set up its office in the San Francisco Bay Area to raise endowment fund.

As reported in **TOI** first, among the top donors are Silicon Valley-based alumni, Anand Rajaraman and Venky Harinarayanan, who have donated \$1 million to create a corpus that will fund Visiting Chairs in computer science and engineering to lead research on data-driven approaches to solve important problems.

The Visiting Chairs will enhance teaching and research efforts, and help attract outstanding young faculty, students, research scholars and postdoctoral fellows to the CSE Department at the IIT.

Date: 23rd August 2017

Publication: The Hindu Business Line

Edition: Mumbai/Pune/Chennai/Kolkata/Kochi/Ahmedabad

Page no.: 17

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland in pact with IIT-M for EV battery research**

URL: <http://www.thehindubusinessline.com/news/ashok-leyland-in-pact-with-iitm-for-ev-battery-research/article9827118.ece>

## Ashok Leyland in pact with IIT-M for EV battery research

### OUR BUREAU

Chennai/August 22

Ashok Leyland and Indian Institute of Technology Madras (IIT-M) have signed an agreement to promote R&D activities for strengthening battery engineering and related sub-parts for electric vehicles.

Under the agreement, Ashok Leyland will sponsor the Centre of Battery Engineering (CoBE) at IIT-M. It will provide a

funding of ₹15 crore over a five-year period to the centre.

The centre will seek to supplement ongoing research by facilitating collaboration between industry and researchers to study various battery characteristics. It will also work on developing the next generation of smart battery chargers and battery management protocols, according to a statement. "We are confident that, with the high quality of people

and the special list of research initiatives, CoBE at IIT-M will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players," said Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, Ashok Leyland.

CoBE will play a larger role in bringing synergies among various industry partners. It will also be doing consulting for

Ashok Leyland as well as others in niche and IPW-intensive areas where there is a need for in-depth testing and development, including simulations.

Bhaskar Ramamurthi, Director, IIT-M, termed battery engineering, specifically for electric vehicles, an important emerging area of research and innovation. CoBE will also provide policy inputs to the national electric vehicles programme.

Date: 23rd August 2017

Publication: The Financial Express

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras sign MoU to set up Centre of Battery Engineering**

URL: <http://www.financialexpress.com/industry/ashok-leyland-iit-madras-sign-mou-to-set-up-centre-of-battery-engineering/819259/>

### **Ashok Leyland, IIT Madras sign MoU to set up Centre of Battery Engineering**

Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here. The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said. As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said.

“With this initiative in battery engineering, we want to be participants in India’s aggressive push to stay ahead of the curve as far as electric mobility is concerned”, Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement. “CoBE at IITM will be a key partner in the country’s electric mobility vision and will help us understand this technology better and stay ahead of global players”, he said. IIT Madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation.

“By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India’s future energy and transportation needs”, he said. The Centre would work towards understanding various battery issues and challenges in areas of applications. It would also undertake high quality research projects to overcome these challenges, the statement added.

Date: 23rd August 2017

Publication: The Economic Times

Edition: Online

Journalist: Prachi Verma

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland to set up Centre of Battery Engineering (CoBE) at IIT Madras**

[URL:http://economictimes.indiatimes.com/articleshow/60174599.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/60174599.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

### **Ashok Leyland to set up Centre of Battery Engineering (CoBE) at IIT Madras**

NEW DELHI: Ashok Leyland and Indian Institute of Technology Madras (IIT Madras) have signed a Memorandum of Understanding (MOU) to set up a Centre of Battery Engineering (CoBE) at IIT Madras.

The objective of this MOU is to promote research and development (R&D) activities for strengthening battery engineering and related sub-parts, especially for electric vehicles. Ashok Leyland will provide a funding of Rs 1.5 crore over a 5-year period to this centre at IIT Madras.

“Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India’s future energy and transportation needs,” Bhaskar Ramamurthi, Director, IIT Madras, said.

The CoBE will seek to supplement the on-going research by facilitating collaboration between industry and researchers.

“With this initiative in battery engineering, we want to be participants in India’s aggressive push to stay ahead of the curve as far as electric mobility is concerned,” Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, said.

Date: 23rd August 2017

Publication: ET Auto

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

**Headline: Ashok Leyland and IIT Madras sign an MOU for Battery Engineering**

URL: <http://auto.economictimes.indiatimes.com/news/industry/ashok-leyland-and-iit-madras-sign-an-mou-for-battery-engineering/60173987>

### Ashok Leyland and IIT Madras sign an MOU for Battery Engineering



New Delhi: Hinduja Group company Ashok Leyland, and the Indian Institute of Technology Madras (IIT Madras) have signed a Memorandum of Understanding (MOU). Under the MoU, Ashok Leyland will sponsor the Centre of Battery Engineering (CoBE) at IIT Madras, according to a company statement.

The CoBE will supplement the on-going research by facilitating collaboration between industry and researchers, which is currently lacking, and study various battery characteristics that are not completely understood even by Global players.

Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, said, "With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned. We are confident that, with the high quality of people and

the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players. We are committed to the Government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country."

Sharing his views about the MoU, Prof. Bhaskar Ramamurthi, Director, IIT Madras, said, "Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

This tie-up will achieve the following objectives:

CoBE will work towards understanding various battery issues and challenges in various areas of applications. It will also undertake high quality research projects to overcome these challenges.

It will focus on the physics part of the battery technology as against other research units working on newer chemistries of the batteries. CoBE will target to work upon Battery Engineering and thorough characterisation of batteries via detailed testing, optimising battery performance for different applications and work towards better economics.

CoBE will collaborate with various cell manufacturers from across the world, procure cells and characterise them to create a knowledge centre on available cells, providing industry with valuable data to select appropriate solutions.

It will study the impact of partial charge-discharge cycles with varying depths of discharge and operating temperatures on battery life. It will work on developing the next generation of smart battery chargers and Battery Management protocols. By working on the design configurations, and packaging cells into modules differently, optimisation studies on batteries for different lifetime for different applications will be undertaken

Prof. Devendra Jalihal, Head, Department of Electrical Engineering, IIT-Madras, under which the CoBE, functions, said, "The CoBE, IIT Madras, is carrying out exciting multi-disciplinary research work in several areas related to battery and electric vehicles including battery management systems, battery testing, battery charging and developing national standards for communication between EV and the cloud servers. The CoBE also provides policy inputs to the national Electric Vehicles program. Potentially, the research can lead to greatly reducing India's dependency on imported oil, to reducing environmental pollution, to greater employment opportunities and to global leadership position."

IIT Madras has a track record of working with industry leaders and innovators. The institution has come up with solutions which are business worthy and help take the technological capability of the industry a step further. For Ashok Leyland, being a part of the CoBE is a very significant step in its journey and it has the potential to help the company understand battery technology as it proliferates the market with its Electric Vehicles with different architectures for different applications.



In addition to joining the panel of sponsors of CoBE, Ashok Leyland is also keen on carrying out a fair amount of confidential consulting research projects with CoBE over the next few years. This will not only help the company evolve as a competitive player and India-optimised solutions provider for its customers but also help realising its ambition to stay ahead of global practices in this domain as the fourth largest Bus Maker in the world.

Additionally, CoBE will play a larger role of coordinating synergy among various industry partners to develop a holistic cooperation model across entire value chain of EV Batteries. It will also be doing consulting for Ashok Leyland as well as others in niche and IPR-intensive areas where there is a need for in-depth testing and development, including simulations. Through this partnership, Ashok Leyland aims to support the EV ecosystem at a national level to bring the industry up to speed considering the limited skills in the country as on date.

Date: 23rd August 2017

Publication: Business Standard

Edition: Mumbai/Delhi/Bangalore/Kolkata/Chennai

Page no.: 2

Journalist: T E Narasimhan

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

**Headline: Leyland MoU with IIT Madras for R&D on e-vehicle battery**

URL: [http://www.business-standard.com/article/companies/ashok-leyland-signs-mou-with-iit-madras-to-carry-r-d-activities-on-battery-engineering-for-ev-117082200455\\_1.html](http://www.business-standard.com/article/companies/ashok-leyland-signs-mou-with-iit-madras-to-carry-r-d-activities-on-battery-engineering-for-ev-117082200455_1.html)

## **Leyland MoU with IIT Madras for R&D on e-vehicle battery**

Ashok Leyland has partnered with IIT (Indian Institute of Technology) Madras to carry out research and development on battery engineering, especially for electric vehicles. IIT Madras is the first institution to set up such an initiative to develop electric mobility ecosystem in India with industry participation. **BS REPORTER**

Date: 23rd August 2017

Publication: The Times of India

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras sign MoU**

URL: <http://timesofindia.indiatimes.com/business/india-business/ashok-leyland-iit-madras-sign-mou/articleshow/60173767.cms>

### **Ashok Leyland, IIT Madras sign MoU**

Chennai, Aug 22() Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here.

The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said.

As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said.

"With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned", Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement.

"CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players", he said.

IIT Madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation.

"By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs", he said.

The Centre would work towards understanding various battery issues and challenges in areas of applications.

It would also undertake high quality research projects to overcome these challenges, the statement added. VIJ TVS

Date: 23rd August 2017

Publication: DNA

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras sign MoU**

URL: <http://www.dnaindia.com/technology/report-ashok-leyland-iit-madras-sign-mou-2538260>

### **Ashok Leyland, IIT Madras sign MoU**

Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here.

The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said.

As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said.

"With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned", Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement.

"CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players", he said.

IIT Madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation.

"By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs", he said.

The Centre would work towards understanding various battery issues and challenges in areas of applications.

It would also undertake high quality research projects to overcome these challenges, the statement added.

Date: 23rd August 2017

Publication: India Today

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras sign MoU**

URL: <http://indiatoday.intoday.in/story/ashok-leyland-iit-madras-sign-mou/1/1031241.html>

### **Ashok Leyland, IIT Madras sign MoU**

Chennai, Aug 22(PTI) Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here. The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchersto study the various battery characteristics, a company statement said. As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said. "With this initiative in battery engineering, we want to be participants in Indias aggressive push to stay ahead of the curve as far as electric mobility is concerned", Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement. "CoBE at IITM will be a key partner in the countrys electric mobility vision and will help us understand this technology better and stay ahead of global players", he said. IIT Madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. "By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for Indias future energy and transportation needs", he said. The Centre would work towards understanding various battery issues and challenges in areas of applications. It would also undertake high quality research projects to overcome these challenges, the statement added. PTI VIJ TVS

Date: 23rd August 2017

Publication: Hindustan Times

Edition: Mumbai

Page no.: 18

Journalist: NA

**Headline: IIT Madras to Get Centre Of Battery Engineering**



## **IIT MADRAS TO GET CENTRE OF BATTERY ENGINEERING**

Indian Institute of Technology, Madras has signed an MOU with Ashok Leyland for setting up 'Centre of Battery Engineering' (CoBE). According to the MOU, Ashok Leyland will provide a funding of INR 1.5 crore over a 5-year period to Centre of Battery Engineering at IIT Madras. It will promote R&D activities for strengthening battery engineering and related sub-parts, especially for electric vehicles. This will make IIT Madras, the first institution to set up such an initiative to develop the Electric Mobility ecosystem in India with industry participation.

Date: 23rd August 2017

Publication: The Times of India

Edition: Chennai

Page no.: 5

Journalist: NA

**Headline: IIT-M, Ashok Leyland signs MoU**

**IIT-M, Ashok Leyland signs**

**MoU:** IIT Madras and Ashok Leyland signed a MoU on Tuesday for developing a centre for battery engineering. It will pave way for research and development activities in the discipline, to improve battery related engineering and development of sub-parts, with a focus on developing electric vehicles. Ashok Leyland will provide a funding of ₹1.5 crores over a 5 year period to the centre which will be set up at IIT-M.

Date: 23rd August 2017

Publication: Deccan Chronicle

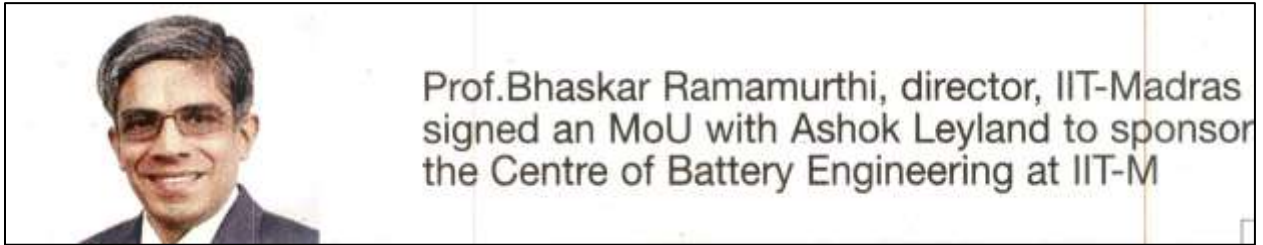
Edition: Chennai

Page no.: 5

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Prof. Bhaskar Ramamurthi, director, IIT-Madras signed an MoU with Ashok Leyland**





Date: 23rd August 2017

Publication: Mail Today

Edition: Delhi/Mumbai

Page no.: 25

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Leyland to fund green study at IIT**

## Leyland to fund green study at IIT

By **Mail Today Bureau**  
in New Delhi

HINDUJA group's flagship firm Ashok Leyland will fund Rs 1.5 crore over five years to set up a Centre of Battery Engineering (CoBE) at the Indian Institute of Technology, Madras.

The Chennai-headquartered heavy commercial major signed a pact with the premier engineering institute on Tuesday in this regard.

The Centre is being set up to study various battery-related issues and undertake high-quality research projects to overcome these challenges.

"The CoBE will seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics," a statement from Ashok Leyland said.

"With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned," Ashok Leyland, electric vehicles and e-mobility solutions, head, Karthick Athmanathan said in the statement.

CoBE at IIT-M will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players, he said.

IIT Madras director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is an important emerging area of research and innovation.

Date: 23rd August 2017

Publication: Business Standard - Hindi

Edition: Mumbai/Delhi

Page no.: 2

Journalist: NA

Headline: IIT Madras in pact with Ashok Leyland

## आईआईटी मद्रास संग अशोक लीलैंड का करार

हिंदुजा समूह की प्रमुख कंपनी अशोक लीलैंड ने भारतीय प्रौद्योगिकी संस्थान (आईआईटी) मद्रास के परिसर में सेंटर ऑफ बैटरी इंजीनियरिंग (सीओबीई) की स्थापना के लिए एक सहमति पत्र पर हस्ताक्षर किए हैं। कंपनी ने एक बयान में बताया कि यह केंद्र बैटरी की विभिन्न विशेषताओं पर अध्ययन के लिए शोधार्थियों और उद्योग के बीच सामंजस्य के लिए सुविधा प्रदान करेगा जिससे इस क्षेत्र में जारी शोध को सहायता मिलेगी। समझौते के अनुसार कंपनी इस केंद्र को पांच साल की अवधि में 1.50 करोड़ रुपये मुहैया कराएगी। गौरतलब है कि अगस्त में अशोक लीलैंड ने इलेक्ट्रिक मोबिलिटी समाधान विकसित करने के लिए रेवा के संस्थापक चेतन मैनी और उदय खेमका द्वारा प्रवर्तित सन मोबिलिटी के साथ रणनीतिक गठजोड़ किया था।

बीएस

Date: 23rd August 2017

Publication: Dabang Duniya

Edition: Mumbai

Page no.: 11

Journalist: NA

**Headline: Ashok Leyland sign an MoU with IIT Madras**

## अशोक लेलैंड, आईआईटी मद्रास के बीच समझौता

चेन्नई, हिंदुजा समूह की प्रमुख कंपनी अशोक लेलैंड ने भारतीय प्रौद्योगिकी संस्थान मद्रास के परिसर में सेंटर ऑफ बैटरी इंजीनियरिंग की स्थापना के लिए एक सहमति झापन पत्र पर हस्ताक्षर किए हैं। कंपनी ने बताया कि यह केंद्र बैटरी की विभिन्न विशेषताओं पर अध्ययन के लिए शोधार्थियों और उद्योग के बीच सामंजस्य की सुविधा देगा, जिससे इस क्षेत्र में जारी शोध को सहायता मिलेगी। समझौते के अनुसार, कंपनी इस केंद्र को पांच साल की अवधि में 1.50 करोड़ की राशि मुहैया कराएगी।

Date: 23rd August 2017

Publication: Afternoon Despatch and Courier

Edition: Mumbai

Page no.: 26

Journalist: NA

**Headline: Business Shots- Ashok Leyland, IIT Madras sign MoU**

## **Ashok Leyland, IIT Madras sign MoU**

Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus. The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said.

Date: 23rd August 2017

Publication: US China News

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland signs MoU with IIT Madras to carry R&D activities on battery engineering for EV**

URL: <http://uschnews.universdev.com/ashok-leyland-signs-mou-with-iit-madras-to-carry-rd-activities-on-battery-engineering-for-ev/>

### **Ashok Leyland signs MoU with IIT Madras to carry R&D activities on battery engineering for EV**

Ashok Leyland has partnered with IIT Madras to carry out research and development (R&D) activities for strengthening battery engineering and related sub-parts, especially for electric vehicles. IIT Madras is the first institution to set up such an initiative to develop the electric mobility ecosystem in India with industry participation.

The Head of Electric Vehicles and e-Mobility Solutions at Ashok Leyland, Karthick Athmanathan, said that with this initiative in battery engineering, the company would be a participant in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned.

CoBE will be a key partner in the country's electric mobility vision and will help in understanding this technology better. It will also help in staying ahead of global players.

In August, Ashok Leyland formed a strategic alliance with SUN Mobility, which is promoted by Reva founder Chetan Maini and Uday Khemka, to develop electric mobility solutions.

Ashok Leyland has been focusing on solutions for electric vehicles as it targets achieving nearly 10-15 per cent of its total bus volume from e-vehicles by 2020.

Professor Bhaskar Ramamurthi, director of IIT Madras, said, "Battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

Professor Devendra Jalihal heads the Department of Electrical Engineering at IIT-Madras. Under this department, the CoBE functions and carries out multi-disciplinary research work in several areas related to batteries and electric vehicles, including battery management systems, battery testing, battery charging, and developing national standards for communication between electric vehicles and cloud servers.

In addition to joining the panel of CoBE sponsors, Ashok Leyland is also keen on carrying out a fair amount of confidential consulting research projects with CoBE over the next few years. This will not only help the company evolve as a competitive player and India-optimised solutions provider for its customers but also

help in realising its ambition to stay ahead of global practices in this domain as the fourth-largest bus maker in the world, said the company.

#### Objectives of the MoU

CoBE will work towards understanding various battery issues and challenges in various areas of applications. It will also undertake high-quality research projects to overcome these challenges.

It will focus on the physics part of battery technology as against other research units working on newer chemistries of the batteries. CoBE will target to work on battery engineering and thorough characterisation of batteries via detailed testing, optimising battery performance for different applications, and work towards better economics.

CoBE will collaborate with various cell manufacturers from across the world, procure cells, and characterise them to create a knowledge centre on available cells, providing the industry with valuable data to select appropriate solutions.

It will study the impact of partial charge-discharge cycles with varying depths of discharge and operating temperatures on battery life.

It will work on developing the next generation of smart battery chargers and battery management protocols. By working on the design configurations and packaging cells into modules differently, optimisation studies on batteries for different lifetimes and for different applications will be undertaken.

Date: 23rd August 2017

Publication: Corporate Ethos

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland inks MoU with IIT Madras to Sponsor Centre of Battery Engg**

URL: <https://corporateethos.com/corporate-domain/ashok-leyland-inks-mou-with-iit-madras-to-sponsor-centre-of-battery-engg/>

### **Ashok Leyland inks MoU with IIT Madras to Sponsor Centre of Battery Engg**

Aug 22: Hinduja group flagship company Ashok Leyland and Indian Institute of Technology Madras (IIT Madras) have signed a Memorandum of Understanding (MoU), whereby Ashok Leyland would sponsor the Centre of Battery Engineering (CoBE) at IIT Madras.

The CoBE will seek to supplement the on-going research by facilitating collaboration between industry and researchers, which is currently lacking, to study various battery characteristics that are not completely understood even among global players, said Ashok Leyland in a statement.

According to Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, the automotive has been leading in pioneering technologies and disruptions in the commercial vehicle space. "Everything we do and strive to achieve is linked to our philosophy, 'Aapki Jeet, Hamari Jeet'. Whether it was meeting the BS-III norms with a mechanical fuel pump or being the first OEM to introduce an all-electric bus, circuit, or the latest innovation, iEGR technology for BS-IV engines, we have always delivered on our promise to help our customers and partners win. With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned."

Expressing confidence that with the high quality of people and the special list of research initiatives CoBE at IITM will be a key partner in the country's electric mobility vision, he said "it will help us understand this technology better and stay ahead of global players. We are committed to the Government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country."

**Ashok Leyland and IIT, Madras sign an MOU**

Sharing his views about the MoU, Prof. Bhaskar Ramamurthi, Director, IIT Madras, said, "Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

Prof. Devendra Jalihal, Head, Department of Electrical Engineering, IIT-Madras, under which the CoBE, functions, signed the MoU. He said, "The CoBE, IIT Madras, is carrying out exciting multi-disciplinary research work in several areas related to battery and electric vehicles including battery management

systems, battery testing, battery charging and developing national standards for communication between EV and the cloud servers. The CoBE also provides policy inputs to the national Electric Vehicles program. Potentially, the research can lead to greatly reducing India's dependency on imported oil, to reducing environmental pollution, to greater employment opportunities and to global leadership position."



Date: 23rd August 2017

Publication: Business Television India

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras Sign MoU to Set up CoBE at Campus**

URL: <http://www.btv.in/article/read/news/28849/ashok-leyland--iit-madras-sign-mou-to-set-up-cobe-at-campus>

### **Ashok Leyland, IIT Madras Sign MoU to Set up CoBE at Campus**

Chennai: Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here.

The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said. As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said.

"With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned", Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement.

"CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players", he said.

IIT Madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. "By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs", he said.

The Centre would work towards understanding various battery issues and challenges in areas of applications. It would also undertake high quality research projects to overcome these challenges, the statement added.

Date: 23rd August 2017

Publication: Daily Excelsior

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras sign MoU**

URL: <http://www.dailyexcelsior.com/ashok-leyland-iit-madras-sign-mou/>

### **Ashok Leyland, IIT Madras sign MoU**

CHENNAI: Hinduja group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here.

The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said.

As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said.

“With this initiative in battery engineering, we want to be participants in India’s aggressive push to stay ahead of the curve as far as electric mobility is concerned”, Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement.

“CoBE at IITM will be a key partner in the country’s electric mobility vision and will help us understand this technology better and stay ahead of global players”, he said.

IIT Madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation.

“By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India’s future energy and transportation needs”, he said.

The Centre would work towards understanding various battery issues and challenges in areas of applications.

It would also undertake high quality research projects to overcome these challenges, the statement added.

Date: 23rd August 2017

Publication: Drive Spark

Edition: Online

Journalist: Sukesh Suvarna

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland and IIT Madras Signs MOU For Sponsoring 'Centre of Battery Engineering'**

URL: <https://www.drivespark.com/four-wheelers/2017/ashok-leyland-iit-madras-mou-centre-of-battery-engineering-023396.html>

### **Ashok Leyland and IIT Madras Signs MOU For Sponsoring 'Centre of Battery Engineering'**

Ashok Leyland and Indian Institute of Technology Madras (IIT Madras) signed a Memorandum of Understanding (MOU), on August 19, 2017, to sponsor the Centre of Battery Engineering (CoBE) at IIT Madras.

The CoBE will help the ongoing research by facilitating collaboration between industry and researchers, which is currently lacking, to study various battery characteristics that are not completely understood even among global players.



IIT Madras has an excellent track record of working with industry leaders and innovators. Ashok Leyland is also keen on carrying out a fair amount of private consulting research projects with CoBE over the next few years.

Apart from that, CoBE will play a major role in coordinating synergy with various industry partners to develop a holistic cooperation model across the entire value chain of EV Batteries. Through this partnership, Ashok Leyland aims to support the EV ecosystem at a national level.

Head of Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, Karthick Athmanathan said, "With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned."

Director of IIT Madras, Bhaskar Ramamurthi said, "By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

DriveSpark Thinks!

The Government of India is planning to shift to all-electric vehicles by 2030. So, this partnership is significant in developing batteries for the electric vehicles. Ashok Leyland is also working on an electric bus, and the new battery technology will be useful for the automaker.

Date: 23rd August 2017

Publication: B Live

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras Ink MoU For Sponsoring CoBE**

URL: <http://b-live.in/2017/08/22/ashok-leyland-iit-madras-ink-mou-sponsoring-cobe/>

### Ashok Leyland, IIT Madras Ink MoU For Sponsoring CoBE



Chennai: Ashok Leyland, the flagship of the Hinduja Group, and Indian Institute of Technology Madras (IIT-Madras) recently signed a Memorandum of Understanding (MoU) to sponsor the Centre of Battery Engineering (CoBE) at IIT Madras by Ashok Leyland.

The CoBE will seek to supplement the on-going research by facilitating collaboration between industry and researchers to study various battery characteristics, according to a press release.

Commenting on the initiative, Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, Ashok Leyland, said, "With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned. We are confident that, with the high quality of people and the special list of research initiatives, CoBE at IITM will be a key partner

in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players."

"We are committed to the government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country," he added.

Prof. Bhaskar Ramamurthi, Director, IIT Madras, said that by pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs.

Date: 23rd August 2017

Publication: Autocar Professional

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland and IIT Madras to set up battery engineering facility**

URL: <http://www.autocarpro.in/news-national/ashok-leyland-iit-madras-ink-mou-set-battery-engineering-facility-25882>

### Ashok Leyland and IIT Madras to set up battery engineering facility



In what is another triumph for industry-academia connect, CV manufacturer Ashok Leyland and the Indian Institute of Technology Madras (IIT Madras) have signed a memorandum of understanding (MoU). Under the MoU, Ashok Leyland will sponsor the Centre of Battery Engineering (CoBE) at IIT Madras.

The CoBE aims to supplement ongoing research by facilitating collaboration between industry and researchers, which is currently lacking, to study various battery characteristics that are not completely understood even among global players.

CoBE aims to work towards understanding various battery issues and challenges across various applications. It will also undertake high-quality research projects to overcome these challenges. This will

involve focusing on the physics part of battery technology as against other research units working on newer chemistries of the batteries.

The Centre will target work in battery engineering and thorough characterisation of batteries via detailed testing, optimising battery performance for different applications and work towards better economics.

CoBE will collaborate with cell manufacturers globally, procure cells and characterise them to create a knowledge centre on available cells, providing the industry with valuable data to select appropriate solutions. It will also study the impact of partial charge-discharge cycles with varying depths of discharge and operating temperatures on battery life.

The facility will also work on developing the next generation of smart battery chargers and battery management protocols. By working on the design configurations, and packaging cells into modules differently, optimisation studies on batteries for different lifetime for different applications will be undertaken.

Driving synergies across EV battery value chain

Additionally, CoBE will play a larger role of coordinating synergy with various industry partners to develop a holistic cooperation model across the entire value chain of EV batteries. It will also be doing consulting work for Ashok Leyland as well as others in niche and IPR-intensive areas where there is a need for in-depth testing and development, including simulations. Through this partnership, Ashok Leyland aims to support the EV ecosystem at a national level.

Commenting on the initiative, Karthick Athmanathan, head, Electric Vehicles and E-Mobility Solutions at Ashok Leyland, said, "Ashok Leyland has been leading in pioneering technologies and disruptions in the commercial vehicle space. We are confident CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players. We are committed to the government's vision for e-mobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country."

Sharing his views about the MoU, Prof. Bhaskar Ramamurthi, director, IIT Madras, said, "Battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."



Date: 24th August 2017

Publication: Outlook

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT Madras sign MoU**

URL: <https://www.outlookindia.com/newscroll/ashok-leyland-iit-madras-sign-mou/1129207>

### **Ashok Leyland, IIT Madras sign MoU**

Chennai, Aug 22 Hinduja Group flagship Ashok Leyland has inked a memorandum of understanding with the Indian Institute of Technology, Madras, to set up Centre of Battery Engineering (CoBE) at its campus here.

The Centre would seek to supplement the ongoing research by facilitating collaboration between industry and researchers to study the various battery characteristics, a company statement said.

As per the tie-up, the city-headquartered heavy commercial major would provide a funding of Rs 1.50 crore over the five year period to the Centre of Battery Engineering, it said.

"With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned", Ashok Leyland, Electric Vehicles and e-Mobility Solutions, Head, Karthick Athmanathan said in the statement.

"CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players", he said.

iit madras Director Bhaskar Ramamurthi said the battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation.

"By pledging long-term support and collaborating with CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs", he said.

The Centre would work towards understanding various battery issues and challenges in areas of applications.

It would also undertake high quality research projects to overcome these challenges, the statement added.

Date: 24th August 2017

Publication: UNI

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT-M inks pact for CoBE**

URL: <http://www.uniindia.com/ashok-leyland-iit-m-inks-pact-for-cobe/states/news/967253.html#TvJ76pD6M2AMWpGC.99>

### **Ashok Leyland, IIT-M inks pact for CoBE**

Chennai, Aug 22 (UNI) The IIT-Madras and Ashok Leyland, flagship of the Hinduja Group, today signed a Memorandum of Understanding (MoU) to sponsor the Centre of Battery Engineering (CoBE) at IIT-M.

The CoBE will seek to supplement the ongoing research by facilitating collaboration between industry and researchers, which was currently lacking, to study various battery characteristics that were not completely understood even among global players.

Commenting on this landmark initiative, Mr. Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, Ashok Leyland said "the company has been leading in pioneering technologies and disruptions in the commercial vehicle space." "Everything that we do and strive to achieve is linked to our philosophy, 'Aapki Jeet, Hamari Jeet'. Whether it was meeting the BS-III norms with a mechanical fuel pump or being the first OEM to introduce an all-electric bus, Circuit, or the latest innovation, iEGR technology for BS-IV engines--we have always delivered on our promise to help our customers and partners win", he said.

"With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned.", he added.

"We are confident that, with the high quality of people and the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players. We are committed to the Government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country", Mr Athmanathan said.

IIT-M Director Prof Bhaskar Ramamurthi said, "Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation."

"By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs", he added.

Date: 24th August 2017

Publication: The Financial Express - Gujarati

Edition: Ahmedabad

Page no.: 18

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

Headline: Ashok Leyland, IIT Madras to set up Centre of Battery Engineering

# અશોક લેલેન્ડ-આઇઆઇટી મદ્રાસે એમઓયુની ઉપર સહીસિક્કા કર્યા

પીટીઆઇ

ચેન્નાઇ, તા. ૨૨

હિંદુજી સુપની મુખ્ય કંપની અશોક લેલેન્ડે મદ્રાસ ખાતેની ઇન્ડિયન ઇન્સ્ટિટ્યુટ ઓફ ટેકનોલોજીના કેમ્પસમાં સેન્ટર ઓફ બેટરી એન્જિનીયરીંગની (સીઓબીઇ) સ્થાપના કરવા સાથે તેની સાથે એમઓયુ પર હસ્તાક્ષર કર્યા છે. કેન્દ્ર વિવિધ બેટરી લક્ષણું સર્વેક્ષણ કરવા સંશોધકો અને ઉદ્યોગ વચ્ચે જોડાણ સરળ કરીને ચાલી રહેલા સંશોધનમા વધારો કરવાની માગ કરશે, તેમ કંપનીએ એક નિવેદનમાં જણાવ્યું હતું.



જોડાણ પ્રમાણે શહેર મુખ્ય મથક ધરાવતી ભારે કોમર્શિયલ અગ્રણી કંપની સેન્ટર ઓફ બેટરી એન્જિનિયરીંગના પાંચ વર્ષ પર રૂ 1.૧.૫૦ કરોડનું ભંડોળ પૂરું પાડશે. બેટરી એન્જિનીયરીંગ સાથે અમે જ્યા સુધી ઇલેક્ટ્રીક

પરિવહનનો સંબંધ છે ત્યા સુધી પરિવહનની આગળ રહેવા ભારતના આક્રમક દબાણમાં ભાગ લેવા માગીશું, તેમ અશોક લેલેન્ડ, ઇલેક્ટ્રીક વિકરક્લ્સ એન્ડ ઇ-મોબીલીટી સોલ્યુશન્સના હેડ કાર્ટિક આત્મનાથને એક

નિવેદનમાં જણાવ્યું હતું. આઇઆઇટીએમમાં સીઓબી ટેશના ઇલેક્ટ્રીક પરિવહન ટૂરંદેશીમાં ચાવીરૂપ ભાગીદાર હશે અને તે વૈશ્વિક ખેલાડીઓ કરતા આગળ રહેવા અને આ ટેકનોલોજી સારી રીતે ઓળખવામાં મદદ કરશે, તેમ તેણે જણાવ્યું હતું. આઇઆઇટી મદ્રાસના ડિરેક્ટર ભાસ્કર રામામૂર્તિએ જણાવ્યું હતું કે ખાસ કરીને ઇલેક્ટ્રીક વિકલ માટે બેટરી એન્જિનીયરીંગ સંશોધન અને નવીનીકરણનું ખૂબ મહત્વનું ક્ષેત્ર છે.

Date: 24th August 2017

Publication: Mid Day - Gujarati

Edition: Mumbai

Page no.: 13

Journalist: NA

**Headline: Ashok Leyland, IIT Madras to set up Centre of Battery Engineering**

## અશોક લેલેન્ડ IIT-મદ્રાસમાં બેટરી એન્જિનિયરિંગ સેન્ટર સ્થાપશે

હિન્દુજા ગ્રુપની અશોક લેલેન્ડ કંપનીએ ઈન્ડિયન ઇન્સ્ટિટ્યૂટ ઓફ ટેકનોલોજી (IIT-મદ્રાસ) સાથે મેમોરેન્ડમ ઓફ અન્ડરસ્ટેન્ડિંગ પર હસ્તાક્ષર કર્યા છે જે મુજબ IIT-મદ્રાસના સંકુલમાં બેટરી એન્જિનિયરિંગનું કેન્દ્ર સ્થાપવામાં આવશે. લેલેન્ડ દ્વારા પાંચ વર્ષમાં આ કેન્દ્ર માટે ૧.૫૦ કરોડ રૂપિયા પૂરા પાડવામાં આવશે. આ કેન્દ્રથી બેટરી ટેકનોલોજી તેમ જ એની વિવિધ લાક્ષણિકતાઓને સમજવામાં મદદ મળશે.

Date: 24th August 2017

Publication: News Today

Edition: Chennai

Page no.: 3

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

Headline: Ashok Leyland, IIT-M enter into agreement

# Ashok Leyland, IIT-M enter into agreement

□ To promote R&D activities for strengthening battery engineering and related sub-parts, especially for electric vehicles

NT Bureau

Chennai, Aug 23: Ashok Leyland, flagship of the Hinduja Group, and Indian Institute of Technology Madras signed a Memorandum of Understanding (MoU) here recently, where the former will sponsor the Centre of Battery Engineering (CoBE) at IIT-Madras.

The CoBE will seek to supplement the on-going research by facilitating collaboration between industry and researchers to study various battery characteristics, said a press release said.

Commenting on the initiative, Ashok Leyland head, Electric Vehicles and e-Mobility Solutions, Karthick Athmanathan said, 'With the new initiative in battery



Ashok Leyland head, Electric Vehicles and e-Mobility Solutions, Karthick Athmanathan, and IIT-Madras Director Bhaskar Ramamurthi during the signing of MoU recently.

engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned.

We are confident that, with the high quality of people and the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players'.

Sharing his views about the MoU, IIT-Madras Director Bhaskar Ramamurthi said, 'Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to the critical technology for India's future energy and transportation needs.'

Deliberating on the agreement, IIT-Madras head, Department of Electrical Engineering, Devendra Jalihal said, 'The CoBE, IIT Madras, is carrying out exciting multi-disciplinary research work in several areas related to battery and electric vehicles including battery management systems, battery testing, battery charging and developing national standards for communication between EV and the cloud servers. The CoBE also provides policy inputs to the national electric vehicles programme. Potentially, the research can lead to greatly reducing India's dependency on imported oil, to reducing environmental pollution, to greater employment opportunities and to global leadership position.'

Date: 24th August 2017

Publication: Web India 123

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: Ashok Leyland, IIT-M inks pact for CoBE**

URL: <https://news.webindia123.com/news/Articles/India/20170822/3173132.html>

### **Ashok Leyland, IIT-M inks pact for CoBE**

The IIT-Madras and Ashok Leyland, flagship of the Hinduja Group, today signed a Memorandum of Understanding (MoU) to sponsor the Centre of Battery Engineering (CoBE) at IIT-M. The CoBE will seek to supplement the ongoing research by facilitating collaboration between industry and researchers, which was currently lacking, to study various battery characteristics that were not completely understood even among global players. Commenting on this landmark initiative, Mr. Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, Ashok Leyland said "the company has been leading in pioneering technologies and disruptions in the commercial vehicle space." "Everything that we do and strive to achieve is linked to our philosophy, 'Aapki Jeet, Hamari Jeet'. Whether it was meeting the BS-III norms with a mechanical fuel pump or being the first OEM to introduce an all-electric bus, Circuit, or the latest innovation, iEGR technology for BS-IV engines--we have always delivered on our promise to help our customers and partners win", he said. "With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned.", he added. "We are confident that, with the high quality of people and the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players. We are committed to the Government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country", Mr Athmanathan said. IIT-M Director Prof Bhaskar Ramamurthi said, "Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation." "By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs", he added. UNI GV 1424

Date: 25th August 2017

Publication: The Hans India

Edition: Hyderabad

Page no.: 14

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

**Headline: Centre of Battery Engineering at IIT-M**

## Centre of Battery Engineering at IIT-M

### OUR BUREAU

**Hyderabad:** Ashok Leyland, and Indian Institute of Technology Madras (IIT-M) signed a Memorandum of Understanding (MOU), for Ashok Leyland to sponsor the Centre of Battery Engineering (CoBE) at IIT Madras. The CoBE will seek to supplement the ongoing research by facilitating collaboration between industry and researchers, which is currently lacking, to study various battery characteristics that are not completely understood even among Global players.

Commenting on this landmark initiative, Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, said, "Ashok Leyland has been leading in pioneering technologies and disruptions in the commercial vehicle space. Everything that we do and strive to achieve is linked to our philosophy, 'Aapki Jeet, Hamari Jeet'. Whether it was meeting

the BS-III norms with a mechanical fuel pump or being the first OEM to introduce an all-electric bus, Circuit, or the latest innovation, iEGR technology for BS-IV engines – we have always delivered on our promise to help our customers and partners win. With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned. We are confident that, with the high quality of people and the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players. We are committed to the Government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country".

Sharing his views about the MoU, Prof Bhaskar Ramamurthi, Director,

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Prof Devendra Jalihal, Head, Department of Electrical Engineering, IIT Madras, under which the CoBE, functions, signed the MoU.

He said, "The CoBE, IIT Madras, is carrying out exciting multi-disciplinary research work in several areas related to battery and electric vehicles including battery management systems, battery testing, battery charging and developing national standards for communication between EV and the cloud servers. The CoBE also provides policy inputs to the national Electric Vehicles programme.

Date: 25th August 2017

Publication: Auto News Press

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

**Headline: Ashok Leyland and IIT Madras sign an MOU for sponsoring 'Centre of Battery Engineering'**

URL: <http://www.autonewspress.com/ashok-leyland-iit-madras-sign-mou-sponsoring-centre-battery-engineering/>

### **Ashok Leyland and IIT Madras sign an MOU for sponsoring 'Centre of Battery Engineering'**



**Mr.Sriram Tirunantalwan, Divisional Manager-Business Development, Ashok Leyland, Dr.GVN Prasad, Vice President, EHVT-Product Development, Ashok Leyland, Mr.Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, Ashok Leyland, Prof. Bhaskar Ramamurthi, Director, IIT-Madras, Prof. Ashok Jhunjunwala, Professor, IIT-Madras and Principal Advisor, Ministries of Power and New and Renewable Energy, Government of India, Dr.Prabhjot Kaur, CoBE, IIT-Madras, Mr.R. Nagarajan, Dean, International and Alumni Relations, IIT-Madras and Prof. Devendra Jalihal, Head, Department of Electrical Engineering, IIT-Madras.**

IIT Madras is the first institution to set up such an initiative to develop the Electric Mobility ecosystem in India with industry participation

· The objective of this MOU is to promote R&D activities for strengthening battery engineering and related sub-parts, especially for Electric Vehicles



Ashok Leyland will provide a funding of INR 1.5 Cr over a 5-year period to Centre of Battery Engineering at IIT-Madras

22nd August, 2017, Chennai: Ashok Leyland, flagship of the Hinduja Group, and Indian Institute of Technology Madras (IIT Madras) signed a Memorandum of Understanding (MOU), on 19th August 2017, for Ashok Leyland to sponsor the Centre of Battery Engineering (CoBE) at IIT Madras. The CoBE will seek to supplement the on-going research by facilitating collaboration between industry and researchers, which is currently lacking, to study various battery characteristics that are not completely understood even among Global players.

Commenting on this landmark initiative, Mr. Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, said, "Ashok Leyland has been leading in pioneering technologies and disruptions in the commercial vehicle space. Everything that we do and strive to achieve is linked to our philosophy, 'Aapki Jeet, Hamari Jeet'. Whether it was meeting the BS-III norms with a mechanical fuel pump or being the first OEM to introduce an all-electric bus, Circuit, or the latest innovation, iEGR technology for BS-IV engines – we have always delivered on our promise to help our customers and partners win. With this initiative in battery engineering, we want to be participants in India's aggressive push to stay ahead of the curve as far as electric mobility is concerned. We are confident that, with the high quality of people and the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players. We are committed to the Government's vision for eMobility and want to develop the ecosystem which will help us come up with customised EV solutions for our country."

Sharing his views about the MoU, Prof. Bhaskar Ramamurthi, Director, IIT Madras, said, "Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

Prof. Devendra Jalihal, Head, Department of Electrical Engineering, IIT-Madras, under which the CoBE, functions, signed the MoU. He said, "The CoBE, IIT Madras, is carrying out exciting multi-disciplinary research work in several areas related to battery and electric vehicles including battery management systems, battery testing, battery charging and developing national standards for communication between EV and the cloud servers. The CoBE also provides policy inputs to the national Electric Vehicles program. Potentially, the research can lead to greatly reducing India's dependency on imported oil, to reducing environmental pollution, to greater employment opportunities and to global leadership position."

IIT Madras has a great track record of working with industry leaders and innovators. The institution has come up with solutions which are business worthy and helps take the technological capability of the industry a step further. For Ashok Leyland, being a part of the CoBE is a very significant step in its journey and it has the potential to help the company understand battery technology as it proliferates the market with its Electric Vehicles with different architectures for different applications. In addition to joining the panel of sponsors of CoBE, Ashok Leyland is also keen on carrying out a fair amount of confidential consulting research projects with CoBE over the next few years. This will not only help the company evolve

as a competitive player and India-optimised solutions provider for its customers but also help realising its ambition to stay ahead of global practices in this domain as the fourth largest Bus Maker in the world.

This landmark tie-up will aim to achieve the following objectives:

CoBE will work towards understanding various battery issues and challenges in various areas of applications. It will also undertake high quality research projects to overcome these challenges.

It will focus on the physics part of the battery technology as against other research units working on newer chemistries of the batteries. CoBE will target to work upon Battery Engineering and thorough characterisation of batteries via detailed testing, optimising battery performance for different applications and work towards better economics.

CoBE will collaborate with various cell manufacturers from across the world, procure cells and characterise them to create a knowledge centre on available cells, providing industry with valuable data to select appropriate solutions.

It will study the impact of partial charge-discharge cycles with varying depths of discharge and operating temperatures on battery life.

It will work on developing the next generation of smart battery chargers and Battery Management protocols. By working on the design configurations, and packaging cells into modules differently, optimisation studies on batteries for different lifetime for different applications will be undertaken

Additionally, CoBE will play a larger role of coordinating synergy among various industry partners to develop a holistic cooperation model across entire value chain of EV Batteries. It will also be doing consulting for Ashok Leyland as well as others in niche and IPR-intensive areas where there is a need for in-depth testing and development, including simulations. Through this partnership, Ashok Leyland aims to support the EV ecosystem at a national level to bring the industry up to speed considering the limited skills in the country as on date.

About IITM ([www.iitm.ac.in](http://www.iitm.ac.in))

Indian Institute of Technology Madras (IITM) was established in 1959 by the Government of India as an Institute of national importance. The activities of the Institute in various fields of Technology and Science are carried out in 16 academic departments and several advanced interdisciplinary Research Academic Centres. The Institute offers undergraduate and post – graduate programmes leading to the B.Tech., M.Sc., M.B.A., M.Tech., M.S., and Ph.D., degrees in a variety of specialisations. IITM is a residential institute with more than 550 faculty and 9000 students. Students from 18 countries are enrolled here. The campus is self-contained and is located on a beautiful wooded area of about 250 hectares. IITM fosters an active entrepreneurial culture with strong curricular support and through the IITM Incubation Cell ([www.incubation.iitm.ac.in](http://www.incubation.iitm.ac.in)).

IIT M has been ranked No.1 amongst Engineering Institutions in the India Rankings 2016 and 2017 and No.2 in the category of Overall Institutions in the 2017 Rankings, released by the National Institutional Ranking Framework, MHRD, Government of India

Date: 25th August 2017

Publication: Careers 360

Edition: Online

Journalist: Harshita Das

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

**Headline: Ashok Leyland partners with IIT Madras to sponsor 'Centre of Battery Engineering'**

URL: <https://engineering.careers360.com/articles/ashok-leyland-partners-iit-madras-sponsor-centre-of-battery-engineering>

### **Ashok Leyland partners with IIT Madras to sponsor 'Centre of Battery Engineering'**



IIT Madras signed a Memorandum of Understanding (MOU) Ashok Leyland on August 19, 2017 to sponsor the Centre of Battery Engineering (CoBE). The objective of the MoU is to promote R&D activities for strengthening battery engineering and related sub-parts, especially for Electric Vehicles. Ashok Leyland will provide a funding of Rs. 1.5 crore over a five year period to CoBE at IIT Madras. Prof. Devendra Jalihal, Head, Department of Electrical Engineering, IIT Madras, under which the CoBE functions, signed the MoU.

Sharing his views about the MoU, Prof. Bhaskar Ramamurthi, Director, IIT Madras, said, "Battery Engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

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Jalihal said, "The CoBE is carrying out exciting multi-disciplinary research work in several areas related to battery and electric vehicles including battery management systems, battery testing, battery charging and developing national standards for communication between EV and the cloud servers. The CoBE also provides policy inputs to the national Electric Vehicles program. Potentially, the research can lead to greatly reducing India's dependency on imported oil, to reducing environmental pollution, to greater employment opportunities and to global leadership position."

Date: 25th August 2017  
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Edition: Online  
Journalist: NA

Professor: Prof. Bhaskar Ramamurthi

**Headline: IIT and Ashok Leyland to collaborate on research**

URL: <http://www.manoramaonline.com/fasttrack/auto-news/2017/08/24/ashok-leyland-to-set-up-centre-of-battery-engineering-cobe-at-iit-madras.html>

## ഗവേഷണത്തിൽ സഹകരിക്കാൻ ഐ ഐ ടിയും അശോക് ലേയ്ലൻഡും

Thursday 24 August 2017 11:48 AM IST

by സ്വന്തം ലേഖകൻ

ബാറ്ററിയിൽ ഓടുന്ന വാഹനങ്ങൾക്കായുള്ള ഗവേഷണ, വികസന(ആർ ആൻഡ് ഡി) പ്രവർത്തനങ്ങൾ ഊർജിതമാക്കാൻ ഹിന്ദുജ ഗ്രൂപ്പിൽപ്പെട്ട അശോക് ലേയ്ലൻഡും മദ്രാസ് ഇന്ത്യൻ ഇൻസ്റ്റിറ്റ്യൂട്ട് ഓഫ് ടെക്നോളജി(ഐ ഐ ടി)യും കൈകോർക്കുന്നു. ബാറ്ററി എൻജിനീയറിങ്ങ് ശക്തിപ്പെടുത്താനും വൈദ്യുത വാഹനങ്ങൾക്കുള്ള യന്ത്രഘടകങ്ങൾ വികസിപ്പിക്കാനുമുള്ള പ്രവർത്തനങ്ങളിലാണ് ഈ പങ്കാളികളും സഹകരിക്കുക.

ധാരണയുടെ ഭാഗമായി അശോക് ലേയ്ലൻഡ് മദ്രാസ് ഐ ഐ ടിയിലെ സെന്റർ ഓഫ് ബാറ്ററി എൻജിനീയറിങ്ങിന്റെ പ്രായോജകരാവും. വരുന്ന അഞ്ചു വർഷത്തിനിടെ 1.50 കോടി രൂപയുടെ സഹായവും കമ്പനി ഈ കേന്ദ്രത്തിനു ലഭ്യമാക്കും. ബാറ്ററികളുടെ സവിശേഷതകൾ പഠിക്കാനായി നിവലിൽ പുരോഗതിയിലുള്ള ഗവേഷണങ്ങളിലാണു സെന്റർ ഓഫ് ബാറ്ററി എൻജിനീയറിങ്(സി ഒ ബി ഇ) വ്യവസായ മേഖലയുടെ പങ്കാളിത്തം തേടുന്നത്. അടുത്ത തലമുറ സ്മാർട്ട് ബാറ്ററി ചാർജറുകളും ബാറ്ററി മാനേജ്മെന്റ് നടപടിക്രമങ്ങളും വികസിപ്പിക്കാനും ഈ കേന്ദ്രത്തിനു പദ്ധതിയുണ്ട്.

മദ്രാസ് ഐ ഐ ടിയിലെ സി ഒ ബി ഇയിലെ വിദഗ്ധ ഗവേഷകരുടെയും ശാസ്ത്രജ്ഞരുടെയും പങ്കാളിത്തത്തോടെ വൈദ്യുത വാഹന വ്യവസായ മേഖലയെ കൂടുതൽ മനസ്സിലാക്കാൻ കഴിയുമെന്ന് അശോക് ലേയ്ലൻഡ് ഇലക്ട്രിക്കൽ വെഹിക്കിൾസ് ആൻഡ് ഇ മൊബിലിറ്റി സൊല്യൂഷൻസ് മേധാവി കാർത്തിക് ആത്മനാഥൻ അറിയിച്ചു.

വ്യവസായ മേഖലയിലെ പങ്കാളികളുമായി മെച്ചപ്പെട്ട സഹകരണം ഉറപ്പാക്കാനാണു സി ഒ ബി ഇ ലക്ഷ്യമിട്ടിരിക്കുന്നത്. അതുകൊണ്ടുതന്നെ ഇന്റലക്ചുവൽ പ്രോപ്പർട്ടി റൈറ്റ് പോലുള്ള തന്ത്രപ്രധാന മേഖലകളിൽ അശോക് ലേയ്ലൻഡിനെ പോലുള്ള കമ്പനികൾക്കായി കൺസൾറ്റൻസി ചുമതല ഏറ്റെടുക്കാനും കേന്ദ്രത്തിനു പദ്ധതിയുണ്ട്. വൈദ്യുത വാഹനങ്ങൾക്കുള്ള ബാറ്ററി എൻജിനീയറിങ്ങ് ഗവേഷണ, വികസന മേഖലയിലെ പുത്തൻ പ്രവണതയാണെന്ന മദ്രാസ് ഐ ഐ ടി ഡയറക്ടർ ഭാസ്കർ രാമമൂർത്തി അഭിപ്രായപ്പെട്ടു.

Date: 28th August 2017

Publication: The Times of India- Education Times

Edition: Delhi

Page no.: 3

Journalist: NA

**Headline: Battery Tech**



### **BATTERY TECH**

Indian Institute of Technology Madras (IIT Madras) signed a Memorandum of Understanding (MoU) with Ashok Leyland, under which Ashok Leyland will sponsor the Centre of Battery Engineering (CoBE) at IIT Madras. The CoBE will focus on the physics part of battery technology and work towards understanding various battery issues and challenges in different areas of applications. It will also undertake high quality research projects to overcome the challenges.

Date: 28th August 2017

Publication: DT Next

Edition: Chennai

Page no.: 4

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Devendra Jalihal

Headline: IIT-M, Ashok Leyland ink deal on battery engineering research

# IIT-M, Ashok Leyland ink deal on battery engineering research

**CHENNAI:** Ashok Leyland and Indian Institute of Technology Madras (IIT Madras) signed a Memorandum of Understanding (MoU) recently, to sponsor the Centre of Battery Engineering (CoBE) at IIT Madras. The CoBE will seek to supplement the on-going research by facilitating collaboration between industry and researchers, which is currently lacking, to study various battery characteristics that are not completely understood even among global players.

CoBE will work towards understanding various battery issues and challenges in various areas of applications. It will also focus on the physics part of the battery technology as against other research units working on newer chemistries of the batteries. CoBE will target to work upon battery engineering and thorough characterisation of batteries via detailed testing, optimising battery performance for different applications and work towards better economics. CoBE will also collaborate with various cell manufacturers from



**Professor Bhaskar Ramamurthi, Director, IIT Madras (fourth from left) after signing the MoU with officials from Ashok Leyland in Chennai**

across the world and will study the impact of partial charge-discharge cycles with varying depths of discharge and operating temperatures on battery life. Most importantly, it will work on developing the next generation of smart battery chargers and battery management protocols.

Karthick Athmanathan, Head, Electric Vehicles and e-Mobility Solutions, at Ashok Leyland, said, "With this initiative in battery engineering, we want to be participants in India's aggressive thrust to stay ahead of the curve as far as electric mobility is concerned. We are confident that with the high quality

of people and the special list of research initiatives, CoBE at IITM will be a key partner in the country's electric mobility vision and will help us understand this technology better and stay ahead of global players."

Prof. Bhaskar Ramamurthi, Director, IIT Madras, said, "Battery engineering, specifically for electric vehicles, is a very important emerging area of research and innovation. By pledging long-term support and collaborating with the CoBE at IIT Madras, Ashok Leyland is making a significant contribution to this critical technology for India's future energy and transportation needs."

Prof. Devendra Jalihal, Head, Department of Electrical Engineering, IIT Madras, under which the CoBE, functions, signed the MoU. He said, "The CoBE, IIT also provides policy inputs to the national electric vehicles programme. Potentially, the research can lead to greatly reducing India's dependency on imported oil, to reducing environmental pollution, to greater employment opportunities and to a global leadership position."

Date: 30th August 2017

Publication: The Hindu

Edition: Chennai

Page no.: 2

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. R. Nagarajan

Alumni: Anand Rajaraman and Venky Harinarayanan

**Headline: IIT-M raises record ₹55 crore**

URL: <http://www.thehindu.com/news/cities/chennai/iit-m-raises-record-55-crore/article19583643.ece>

# IIT-M raises record ₹55 crore

## Money collected from 1,827 donors, mainly alumni

**SPECIAL CORRESPONDENT**

**CHENNAI**

The Indian Institute of Technology-Madras (IIT-M) has raised a record ₹55 crore for the financial year 2016-2017, recording a 70% increase in new donors over the preceding year.

From merely 36 donors in 2001-04, the institute has managed to collect money from 1,827 donors in 2016, institute officials said. IIT-M, which has set a goal of raising ₹500 crore by 2020, has received the most money from alumni. Families of alumni who have since passed away, have also sponsored merit scholarships, officials said.

According to an institute release, this year, most of the donors were from India. The institute's Annual Giving

Report for 2016 has found a 30% increase in mean funding per CSR project.

### Visiting chairs

The star donors this year were Silicon Valley-based Anand Rajaraman and Venky Harinarayanan, who donated \$1 million to create a corpus to fund visiting chairs in computer science and engineering. The endowment aims to lead research on data-driven approaches to solve problems.

The visiting chairs will enhance teaching and research efforts in this area, and help attract outstanding young faculty, students, research scholars and post-doctoral candidates to the computer science and engineering department, according to R. Nagarajan, dean of interna-

tional and alumni relations.

Institute director Bhaskar Ramamurthi said, "It makes a huge difference when alumni do something to help in their own way, such as connecting their companies to our faculty to discover new collaborations, make a CSR grant, mentor our start-ups, help them fine-tune their products and discover new markets".

The report was first published six years ago to acknowledge contributions. "Now, it has become a chronicle of growth. We are able to record and review our various developmental initiatives, and prune or enhance them as appropriate. I want to thank our creative partner, STAMPA, which has supported us over this process," Mr. Nagarajan said.

Date: 30th August 2017

Publication: The Economic Times

Edition: Online

Journalist: Prachi Verma

Professor: Prof. Bhaskar Ramamurthi

**Headline: IIT Madras raises highest ever funding of Rs 55 crore**

URL: [http://economictimes.indiatimes.com/articleshow/60276276.cms?utm\\_source=contentofinterest&utm\\_medium=text&utm\\_campaign=cppst](http://economictimes.indiatimes.com/articleshow/60276276.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)

### **IIT Madras raises highest ever funding of Rs 55 crore**

Indian Institute of Technology Madras (IITM) has raised Rs 55 crore as funding in the fiscal 2016-17, the highest ever so far. The institute has also seen a 70 per cent increase in new donors over the previous financial year.

IITM received a majority of funds from alumni contributions for visiting chairs, institute chairs, infrastructure on campus, CSR projects, TCS research project, workshops, and healthcare Innovation centre.

This financial year, most donors were from India. According to the institute's 'Annual Giving Report 2016', 25 CSR projects are currently underway and average funding per CSR project was approximately Rs 50 lakh, indicating a 30 per cent increase. According to a release issued by the institute, IITM has set a target of raising Rs 500 crore by the year 2020.

"It makes a huge difference when alumni do something to help in their own ways like connecting their companies to our faculty to discover new collaborations or make a CSR grant, mentor our start-ups and help them fine-tune their products and discover new markets," Bhaskar Ramamurthi, director, IIT Madras said. The list of donors has increased in 2016-17 to 1,827 from 36 donors in 2001-2004.



**IIT Madras is a research-focused  
Institute**

# An Eye for Engineering

How an engineer who walked in for treatment to LV Prasad Eye Institute changed the way engineering is used in Indian ophthalmology  
**Hari Pulakkat**

VS Sangwan likes to answer his patients' questions thoroughly, and he usually takes more than 15 minutes to do so. He is a 50-year-old man with a friendly smile. He is a doctor at LV Prasad Eye Institute, one of the largest eye hospitals in India. He has treated thousands of patients, and he is now preparing to return to his home country, the United States. Sangwan is a mechanical engineer by training, and he has spent the last 15 years working in the field of adaptive optics. He has worked for several years at the University of Illinois at Urbana-Champaign, where he was part of a team that developed the first adaptive optics laser scanning microscope. He has also worked for several years at the University of Michigan, where he was part of a team that developed the first adaptive optics laser scanning microscope. Sangwan is now working at LV Prasad Eye Institute, where he is using his expertise in adaptive optics to help improve the lives of patients with eye disease.

## Why Adaptive Optics is Important

When ground-based telescopes observe the night sky, they are often limited by atmospheric turbulence. Adaptive optics is a technology that allows ground-based telescopes to overcome this limitation by using a laser to create a reference beam that is used to measure the distortions in the atmosphere. This information is then used to adjust the shape of a mirror in real time, effectively canceling out the distortions. This process is repeated many times per second, allowing the telescope to maintain a sharp focus on the stars.

The resolution of ground-based telescopes is limited by atmospheric turbulence. Adaptive optics is a technology that allows ground-based telescopes to overcome this limitation by using a laser to create a reference beam that is used to measure the distortions in the atmosphere. This information is then used to adjust the shape of a mirror in real time, effectively canceling out the distortions. This process is repeated many times per second, allowing the telescope to maintain a sharp focus on the stars.

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VS Sangwan (left) set up an Adaptive Optics Scanning Laser that he uses to observe stars. In the photo, which can image individual cells of the retina, he is right to experiment with laser light.

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VS Sangwan likes to answer his patients' questions thoroughly, and he usually takes more than 15 minutes to do so. He is a 50-year-old man with a friendly smile. He is a doctor at LV Prasad Eye Institute, one of the largest eye hospitals in India. He has treated thousands of patients, and he is now preparing to return to his home country, the United States. Sangwan is a mechanical engineer by training, and he has spent the last 15 years working in the field of adaptive optics. He has worked for several years at the University of Illinois at Urbana-Champaign, where he was part of a team that developed the first adaptive optics laser scanning microscope. He has also worked for several years at the University of Michigan, where he was part of a team that developed the first adaptive optics laser scanning microscope. Sangwan is now working at LV Prasad Eye Institute, where he is using his expertise in adaptive optics to help improve the lives of patients with eye disease.

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**Engineers are as important in a hospital as doctors**  
**VS SANGWAN**  
Optical engineer

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## RESULTANT GAINS

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Date: 2nd August 2017

Publication: Hindustan Times- HT Education

Edition: Delhi

Page no.: 2

Journalist: Sarah Zia

Professor: Prof. Andrew Thangaraj

Headline: Indigenous MOOCs platform launched

## Indigenous MOOCs platform launched

Sarah Zia

• [razia@ht.com](mailto:razia@ht.com)

**NEW DELHI:** The Ministry of Human Resource Development launched SWAYAM or Study Webs of Active-Learning for Young Aspiring Minds, an indigenous platform for Massive Open Online Courses (MOOCs) this month to aid students with their regular study.

The platform can host about 2000 courses with several courses already available while the next batch is likely to be uploaded by August.

There are seven national coordinators for the digital plat-

form where students can access the courses free-of-cost. These are Consortium for Educational Communication (CEC) for non-technical undergraduate education; University Grants Commission (UGC) for postgraduate education; National Council For Education and Training (NCERT) and National Institute of Open Schooling (NIOS) for school-level education; Indira Gandhi National Open University (IGNOU) for out of school students; National Programme on Technology Enhanced Learning (NPTEL) for engineering courses and IIM Bangalore for management courses.

While CEC, NPTEL and NIOS have already been hosting online courses on their web portals, IIM Bangalore has been offering its programmes on the international platform, edX.

"These courses are syllabus-based and are designed to help students prepare for their relevant exams," says Rajbir Singh, director, CEC.

"They act as supplementary material to the coursework students undertake at their respective institutions."

While the courses are open to everyone, these are designed in sync with the curriculum taught across universities at

various levels. For instance, those enrolled under the choice-based credit system can earn 20% credit from these MOOCs and transfer the credits of the online programme to the programme they are enrolled in at their institution. "If a certain programme is unavailable at another university, one can earn credits for it by enrolling in that MOOC on the SWAYAM platform," explains Singh.

Currently, all courses are offered in English though plans to offer them in Hindi and subsequently, in other Indian languages are in place.

"Not all students can physically attend classes at IITs and other premiere institutes, hence, these courses ensure that students learn from the best minds across the country," adds Prof Andrew Thangaraj, NPTEL coordinator, IIT Madras.

"While international platforms like edX and Coursera may provide add-on certifications, the purpose of these courses is to provide content that is tailored to an Indian student's needs," says Singh. "Difference in accents may also be a constraint on international platforms as against an indigenous platform."

Apart from the SWAYAM web portal, these courses are also available on the SWAYAM mobile app as well as the web portal of the host coordinator.

Prior to the online platform, television was used for disseminating education with the first such programming launched in 1984 by the UGC titled "Under the Countrywide Classroom". Subsequently, Doordarshan's Gyan Darshan channel was launched in 2001.

Currently, educational television programming will be offered under Swayam Prabha, a consortium of 32 DTH channels that will provide school-level, undergraduate and post-graduate content sourced from the seven national coordinators. Further, there will also be a component for lifelong learners as well as content to enable preparation for competitive exams sourced under the IIT-PAL initiative.

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Edition: Chennai / Delhi / Mumbai / Pune / Bangalore / Hyderabad / Kolkata / Kochi / Ahmedabad

Page no.: 16

Journalist: TV Jayan

Professor: Prof. T. Pradeep

**Headline: A 'silver lining' in storage of fruits and vegetables**

URL: <http://www.thehindubusinessline.com/economy/agri-business/a-silver-lining-in-storage-of-fruits-and-vegetables/article9797402.ece>

## A 'silver lining' in storage of fruits and vegetables

Packaging with silver nanoparticles can extend shelf life, says study

TV JAYAN

New Delhi, August 1

Packing materials impregnated with traces of silver nanoparticles can help preserve fruits and vegetables for a much longer period, a study has shown.

Researchers from the Haldia Institute of Technology (HIT) in West Bengal found that incorporation of silver nanoparticles in packing material can help enhance the shelf-life of perishable farm produce significantly.

"We have been able to show that when silver nanoparticles are impregnated into cellulosic food packets, they could preserve vegetables like tomatoes and cabbage at room temperatures for as long as 21 days," said Mukesh Singh, an associate professor in HIT's biotechnology department. Typically, these vegetables rot in 7-10 days.

"It is well known that silver nanoparticles have anti-microbial properties. We too have shown this in our studies in the past," said Singh, who is the main author of the study that appeared in the journal *IWT - Food Science and Technology*.

Silver nanoparticles coated

food packets are already in vogue in advanced countries, but the cost is quite high and unaffordable for most people here.

The method of impregnating silver nanoparticles into packaging material, on the other hand, is extremely cost-effective, Singh said.

To understand the effectiveness of the specially-prepared packing material, the scientists explored whether it is capable of controlling the growth of a food-borne bacterium called *Aeromonas hydrophila*. They found that the

silver nanoparticles were effective in checking its growth.

The researchers were also able to address one of the major concerns associated with using silver nanoparticles

in food processing - migration of nanosilver from polymer composites into food materials. Nanoparticles having sizes of 1-3.5 nanometres have a high rate of migration from polymer to food materials, posing toxicity problems.

"Our synthesised silver nanoparticles have an average size of 35 nm, which is 10 times larger, so there is least chance of migration of silver ions into food," said Singh.

Talappil Pradeep, professor of chemistry at IIT-Madras, who is among the first set of Indian scientists to study the anti-microbial properties of silver nanoparticles, said the work looks interesting.



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Page no.: 1

Journalist: Sowmiya Ashok

Professor: Prof S A Sannasiraj

**Headline: Team from IIT is growing an island off the Tamil Nadu coast**

URL: <http://indianexpress.com/article/india/team-from-iit-is-growing-an-island-off-the-tamil-nadu-coast-4781557/>

# Team from IIT is growing an island off the Tamil Nadu coast



**SOWMIYA ASHOK**  
NEW DELHI, AUGUST 3

**PAGE ONE**  
**ANCHOR**

HOW TO grow back an island? IIT Madras may have the answer, if you go by what a team of five researchers from the institute have achieved in just two years on Vaan Island, 12 km off the Tuticorin coast in Tamil Nadu and one of 21 uninhabited islands in the Gulf of Mannar.

Before the IIT team stepped in, the island had shrunk from 16 hectares in 1986 to 1.5 hectares

in 2015. Today, "artificial reefs" have helped it "gain mass" by 7.6 per cent — from 1.5284 hectares in December 2015 to 1.6454 hectares.

Three years ago, the Tamil Nadu Government's Department of Environment red-flagged drastic changes in

**CONTINUED ON PAGE 2**

## Team from IIT

Vaan Island, the southernmost in the string of islands, in the Marine Biosphere Reserve.

The Gulf of Mannar, between India and Sri Lanka, is the first marine biosphere reserve in Asia, which was created by the Indian government in 1989, with the chain of 21 islands and adjoining coral reefs off the coast of Ramanathapuram and Tuticorin forming the core.

A Tamil Nadu government database noted in 2015 that "about ¼ area of this island has already become submerged due to the removal of coral reefs". It also pointed out that "heavy biotic interference due to its nearness to Tuticorin town" and "frequent fires" caused by fishermen were the main reasons for the degradation of the island's biodiversity.

In 2014, the state's Environment Department approached IIT Madras with a request: find a solution to protect the island without using engineering structures.

"The objective was to control the erosion of the island and to facilitate coral rehabilitation in surrounding areas. Coral mining

was once rampant in this area, and that combined with rising sea levels have over the years harmed the island," H Malleshappa, director, Environment Department, Tamil Nadu, told *The Indian Express*.

A stark example is that of The Great Barrier Reef in Australia which has, perhaps, been irreversibly damaged due to coral mining.

IIT Madras designed a "two-layer submerged reef breakwater system". In other words, 9,000 small units of reinforced concrete structure with holes were lowered into the sea, 250m off the island's shoreline, and placed in a semi-circular fashion, in the first phase.

"These concrete structures were previously used in other parts of the world to rehabilitate corals. But this was the first time it was being used to protect an island," said Prof S A Sannasiraj, head, Department of Ocean Engineering, IIT Madras, who is steering the project.

Sannasiraj's team launched a study in 2014 and worked with the Suganthi Devadason Marine Research Institute in Tuticorin to design and build small models, which were then studied through laboratory modelling at the IIT.

The first phase was implemented in

September 2015, when the first layer of artificial reef was completed at a cost of Rs 12 crore — the second phase is expected to start soon.

"We worked out the design, the build, how to place it, studied waves and determined where to place the structures," said Sannasiraj. "The holes in the concrete structure was to achieve good water circulation, so as to achieve wave dissipation. The holes are also required for marine growth. It only took eight months for corals to start growing on these structures," he said.

The islands play a crucial role in protecting a 170-km coastal stretch. "Even though these islands are uninhabited, they perform a crucial role in dissipating wave energy before it reaches the coast of Tamil Nadu," said Sannasiraj.

"The space between the islands and the coast is like a swimming pool, where fishermen often park their boats. The mainland is naturally protected by these islands," he said.

According to Sannasiraj, the project may be extended to the next island, Koswari, which is also losing ground to erosion. "Due to excess removal of corals over the last decade, about one-fourth of this island is sinking under water," the 2015 database noted.

Date: 4th August 2017

Publication: Down to Earth

Edition: Online

Journalist: Dinesh C Sharma

**Headline: Tamil Nadu deploying artificial reefs to save sinking islands**

URL: <http://www.downtoearth.org.in/news/tamil-nadu-deploying-artificial-reefs-to-save-sinking-islands-58392>

### **Tamil Nadu deploying artificial reefs to save sinking islands**

Sinking islands may become a reality with sea level rise and climate change in decades to come. Tamil Nadu has hit upon a novel idea to protect such islands on its coast—deploying artificial reefs near vulnerable islands.

Artificial reefs, made of concrete, have been found capable of preventing further erosion of ecologically sensitive islands and regenerating coral biodiversity in the Gulf of Mannar. “We have successfully demonstrated this in Vaan island in the Munnar region. The island which had sunken to a great extent over decades has regained some of its area,” said H Mallehappa, head of the Tamil Nadu State Climate Change Cell.

Vaan is one of the 21 islands in the Gulf of Mannar, which was declared a marine biodiversity park in 1986. Indiscriminate mining of coral and destructive fishing practices in past decades have fully submerged two islands. Vaan was on the verge of submergence when the project began in 2015. Its area had been reduced from 16 hectares in 1986 to 2 hectares in 2014. “Following the deployment of artificial reefs, new accretion has occurred,” Mallehappa told India Science Wire on the sidelines of a workshop on climate change.

The area of Vaan island has increased by 2.24 hectares in low tide and 1.8 hectare in mean tide between December 2015 and August 2016. The restoration of Vaan island is one the climate adaptation projects funded by the National Adaptation Fund for Climate Change of the Ministry of Environment, Forests and Climate Change. The state has been given Rs 25 crore for the project.

It is the first attempt in India to protect and restore a sinking island. Deployment of artificial reefs parallel to the sinking island in the seaward side reduces the effect of currents and waves, enhances fish habitats for higher fish production and protection of fish diversity. Natural corals get attached to artificial reefs over time and start regeneration. Following the success in Vaan, Tamil Nadu has proposed to undertake restoration of two more islands and has approached Green Climate Fund for funding of Rs 100 crore.

The first two phases of the project were funded by the TN Coastal Zone Protection Authority, starting in February 2015. The project had two components in these phases—coral rehabilitation and artificial reef deployment. In the first phase, three square kilometre degraded area around the island was rehabilitated with native coral species using standard coral transplantation techniques. Rehabilitated coral sites were monitored regularly to document survival and growth of the transplanted corals. The survival rate is 80 to

90 per cent and spawning has been observed in transplanted corals. The coral rehabilitation project was started with technical expertise from the Suganti Devadason Marine Research Institute.

None of the islands are inhabited but they support livelihoods. Therefore, one of the key objectives of the project is to undertake eco-development activities among coastal communities to enhance their adaptive capacity, Malleshappa added. In the second phase, artificial reefs were deployed. For this, the Indian Institute of Technology Madras (IIT-M) conducted wave dynamic and bathymetry studies. Based on this the design was finalised and locations identified for deploying artificial reef modules. Each module is 2.5 meter in width, 2 meter in height and 1 meter in longitudinal length, and weighs 1.8 tonnes. The concrete reefs have been deployed 250 meters from the island in a semi-circular constellation. In the first two phases, 4,600 modules have been deployed in eight months. Now with the funding from Adaptation Fund, the plan is to take the total number of artificial reefs to 10,000 in two layers.

Though the reason for erosion of islands is combination of several factors, experts point out that sea level rise due to climate variation is posing additional threat to coastal islands. "Low-lying coastal areas are more vulnerable to impacts of climate change as they are highly prone for inundation due to sea level rise," observed K Palanivelu, director of the Centre for Climate Change and Adaptation Research at Anna University.

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Publication: The Financial Express

Edition: Online

Journalist: NA

**Headline: IIT Madras team is growing island off Tamil Nadu coast, here is how**

URL: <http://www.financialexpress.com/india-news/iit-madras-team-is-growing-island-off-tamil-nadu-coast-here-is-how-vaan-island-gulf-of-mannar/793395/>

### **IIT Madras team is growing island off Tamil Nadu coast, here is how**

Amidst hue and cry over plundering of natural resources, a team of researchers from Indian Institute of Technology Madras have been growing an island off the Tamil Nadu coast since 2015

Amidst hue and cry over plundering of natural resources, a team of researchers from Indian Institute of Technology Madras have been growing an island off the Tamil Nadu coast since 2015, Indian Express reported today. Little known Vaan Island is located 2 km off the Tuticorin coast in the southern state. It is one of 21 uninhabited islands in the Gulf of Mannar. In 1986, the island had 16 hectares of land. It was reduced to meager 1.5 hectares of land in 2015 when five researchers from the prestigious institute had landed in the island. At present artificial reefs created by the researchers have helped the island gain mass by 7.6 per cent — from 1.5284 hectares in December 2015 to 1.6454 hectares, as per the report.

The Gulf of Mannar is located between India and Sri Lanka. Notably, it is the first marine biosphere reserve in Asia and was created by the Indian government in 1989, with the chain of 21 islands and adjoining coral reefs off the coast of Ramanathapuram and Tuticorin forming the core, according to IE story. In 2014, Tamil Nadu's Environment Department approached IIT Madras with to find a solution to protect the island without using engineering structures.

"The objective was to control the erosion of the island and to facilitate coral rehabilitation in surrounding areas. Coral mining was once rampant in this area, and that combined with rising sea levels have over the years harmed the island," H Malleappa, director, Environment Department, Tamil Nadu, told The Indian Express.

Last month, during a meeting with top scientific officials, Prime Minister Narendra Modi had said that applying science to solve the country's problems is a priority for the government. He said and asked officials to come up with specific targets which could be achieved in the field of science by 2022. He exhorted officials to break silos and strongly emphasized that a mechanism be formed to document and replicate successful innovations at the grassroots level, PTI reported on July 19.



Date: 4th August 2017

Publication: India.com

Edition: Online

Journalist: NA

Professor: Prof S A Sannasiraj

**Headline: IIT-Madras Team Brings Back Island Submerged Off Tuticorin Coast in Tamil Nadu**

URL: <http://www.india.com/news/india/iit-madras-team-brings-back-island-submerged-off-tuticorin-coast-in-tamil-nadu-2376867/>

### **IIT-Madras Team Brings Back Island Submerged Off Tuticorin Coast in Tamil Nadu**

New Delhi, August 4: A team of researchers from Indian Institute of Technology (IIT) Madras brought back an island off Tuticorin Coast which was partially submerged due to coral mining. This island, which is among the 21 uninhabited islands in the Gulf of Mannar, shrunk almost 10 times of its initial size in 1986. But the IIT team reportedly helped it gain mass by 7.6 per cent in two years, bringing back hopes of protecting the island.

The team of five scholars led by Professor S A Sannasiraj, Head of Department of Ocean Engineering, IIT Madras aims to control the erosion of the island and facilitate coral rehabilitation in surrounding areas. An Indian Express report quoted Director of Environment Department, Tamil Nadu, H Malleshappa, who says that combined with coral mining and rising sea levels over the year has harmed the island.

According to the report, in 1986, the island was 16 hectares, which shrunk to 1.5 hectares in 2015. The project led by the IIT-team have been able to increase the mass of the island from 1.5284 hectares in December 2015 to 1.6545 hectares in 2017.

In 2014, alarmed by the submergence of the Vaan island, the Tamil Nadu government approached IIT Madras to protect the island. A report by the Government stated how one-fourth of the island was already submerged due to removal of coral reefs. The report also reportedly pointed out 'heavy biotic interference due to its nearness to Tuticorin town', Indian Express reported.

IIT Madras hence devised a project with the specific need of the island and used a system named, 'two-layer submerged reef breakwater system'. Indian Express report claim that these are 9,000 small units of reinforced concrete structure with holes, which are lowered into the sea and placed in semi-circular fashion, in the first phase, 250 m off the island's shoreline.

The holes in the concrete helps in achieving good water circulation and wave dissipation. They also facilitate marine growth. Indian Express quoted by Sannasiraj saying that in eight months they observed corals growing on these structures.

Noteworthy that while these corals were used in coral rehabilitation projects around the world, this is the first time they are being used to protect an island. The first phase which was initiated in 2015 was completed at a cost of Rs 12 crore and the second phase is expected to begin soon.

The importance of these islands lie in the fact that they protect the 170 kilometre coastal stretch and dissipates wave energy before it reaches the coast of Tamil Nadu. The Gulf of Mannar is India's first marine biosphere reserve in Asia, created in 1989 by the Indian Government. It is situated between India and Sri Lanka and is a chain of 21 islands and adjoining coral reefs off the coast of Tuticorin and Ramanathapuram.

Date: 5th August 2017

Publication: India Live Today

Edition: Online

Journalist: Avinash Nandakumar

Professor: Prof S A Sannasiraj

**Headline: Learn how to grow back an island in Gulf of Mannar, from IIT Madras researchers**

URL: <http://www.indialivetoday.com/learn-grow-back-island-gulf-mannar-iit-madras-researchers/184987.html>

A team of researchers from Indian Institute of Technology (IIT) Madras brought back an island off Tuticorin Coast which was partially submerged due to coral mining. This island, which is among the 21 uninhabited islands in the Gulf of Mannar, shrunk almost 10 times of its initial size in 1986. But the IIT team reportedly helped it gain mass by 7.6 per cent in two years, bringing back hopes of protecting the island.

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Date: 5th August 2017

Publication: WION

Edition: Online

Journalist: NA

Professor: Prof. S A Sannasiraj

**Headline: IIT Madras team helps grow island in Gulf of Mannar**

URL: <https://www.wionews.com/south-asia/iit-madras-team-revives-an-island-in-gulf-of-mannar-18590>

### **IIT Madras team helps grow island in Gulf of Mannar**

A group of five researchers from IIT Madras has initiated a project to protect an island, Vaan, which is 12 km off the Tuticorin coast in Tamil Nadu.

The island is one of the 21 uninhabited islands in the Gulf of Mannar. It has shrunk from 16 hectares in 1986 to 1.5 hectares in 2015.

The institute placed 9,000 small units of 'reinforced concrete structure with holes' into the sea, about 250m off the island shoreline, according to a report in The Indian Express.

The head of Department of Ocean Engineering at IIT Madras, Professor S A Sannasiraj said similar concrete structures have already been used in other parts of the world to revive corals. But It was the first time that the project is being used to safeguard an island.

"Even though these islands are uninhabited, they perform a crucial role in dissipating wave energy before it reaches the coast of Tamil Nadu," said Sannasiraj.

Sannasiraj has been working with the Suganthi Devadason Marine Research Institute since 2014. The team had been devising and building small models which were studied in IIT.

The first layer of the artificial reef was completed in September 2015 at the cost of Rs 12 crore.

The second phase is expected to come soon.

The professor also hinted on expanding the project to another island, Kosiwari as the island is also getting eroded.

Date: 5th August 2017

Publication: Inuth

Edition: Online

Journalist: NA

**Headline: How a team from IIT is helping reclaim a sinking island off Tamil Nadu coast**

URL: <http://www.inuth.com/india/how-a-team-from-iit-is-helping-reclaim-a-sinking-island-off-tamil-nadu-coast/>

### **How a team from IIT is helping reclaim a sinking island off Tamil Nadu coast**

Amid growing environmental concerns due to massive exploitation of natural resources and unabated pollution, a team of researchers from Indian Institute of Technology Madras are working on a splendid idea to save a sinking island off the Tamil Nadu coast from last two years.

The researchers are helping reclaim Vaan Island, which is located 2 km off the Tuticorin coast. In 1986, the island had 16 hectares of land. It was reduced to meager 1.5 hectares of land in 2015. Concerned over the degradation, Tamil Nadu's Environment Department had approached IIT Madras in 2014 to find a solution to protect it without using engineering structures. It was then the team of five decided to save the island by deploying artificial reef. The island has gained mass by 7.6 per cent — from 1.5284 hectares in December 2015 to 1.6454 hectares. Notedly, Vaan is one of 21 uninhabited islands in the Gulf of Mannar.

Also Read: Splendid effort by IIT Madras helps rescue lost beaches in Kerala. Here is how

Artificial reefs, made of concrete, have been found capable of preventing further erosion of ecologically sensitive islands. Over time natural corals get attached to artificial reefs and start regeneration. Vaan is one of the 21 islands in the Gulf of Mannar, which was declared a marine biodiversity park in 1986.

“The objective was to control the erosion of the island and to facilitate coral rehabilitation in surrounding areas. Coral mining was once rampant in this area, and that combined with rising sea levels have over the years harmed the island,” H Malleappa, director, Environment Department, Tamil Nadu, told The Indian Express.

Last month, during a meeting with top scientific officials, Prime Minister Narendra had said that applying science to solve the country's problems is a priority for the government. He said and asked officials to come up with specific targets which could be achieved in the field of science by 2022, reported

Date: 5th August 2017

Publication: India Times

Edition: Online

Journalist: Anjali Bisaria

**Headline: IIT Madras Team Rediscovered A Submerged Island Off The Tamil Nadu Coast**

URL: <http://www.indiatimes.com/news/india/iit-madras-team-rediscovered-a-submerged-island-off-the-tamil-nadu-coast-327194.html>

### **IIT Madras Team Rediscovered A Submerged Island Off The Tamil Nadu Coast**

Vaan Island, located some 12 km off Tuticorin coast in Tamil Nadu, shrunk from 16 hectares to 1.5 hectares from the year 1986 to 2015. But thanks to a team of five researchers from IIT Madras, the island is being rediscovered.

With the help of artificial reefs, the island has grown in mass by 7.6 per cent - since December 2015, it grew from 1.5284 hectares to 1.6454 hectares, reports The Indian Express.

Vaan Island is one of the 21 uninhabited islands in the Gulf of Mannar that falls between India and Sri Lanka. 1/4th of the area had already submerged in water due to the removal of coral reefs. In 2014, the Tamil Nadu's Environment Department called upon IIT Madras to help find a solution to protect the disappearing island. They had one condition - to do so without using any engineering structures.

The team from IIT Madras developed a "two-layer submerged reef breakwater system". The first phase was enforced in September 2015 at a cost of Rs 12 crore to install the first layer - where 9,000 units of concrete structures with holes were submerged and placed in a semi-circular manner.

The holes in these structures aided toward water circulation and the growth of marine corals.

The second phase is expected to start soon.

Date: 5th August 2017

Publication: News 18

Edition: Online

Journalist: NA

Professor: Prof S A Sannasiraj

**Headline: IIT Madras Team is Rebuilding an Island in Tamil Nadu: All You Need to Know**

URL: <http://www.news18.com/news/tech/iit-madras-team-is-rebuilding-an-island-in-tamil-nadu-all-you-need-to-know-1482629.html>

### **IIT Madras Team is Rebuilding an Island in Tamil Nadu: All You Need to Know**

An IIT Madras team of researchers has practically grown an island back to life after the island had shrunk to a mere 1.5 hectares in 2015. The 5 team members used 'artificial reefs' to grow the disappearing 'Vaan' island back to a size of 1.64 hectares, a growth of 7.6 percent within two years. Located southernmost in the Marine Biosphere Reserve. A 2015 database of the Tamil Nadu government red-flagged the Vaan Island, mentioning the submergence of one-fourth area of the island. Since 1985, the island had shrunk from 16 hectares to 1.5 hectares in 2015. The database blamed coral mining, biotic intrusion from Tuticorin town and frequent fires by fishermen for the shrinking island.

IIT Madras was sought to protect the island from the impending doom. The IIT team was asked to enable the rehabilitation of coral reef, while also reducing the erosion on the island. The IIT Madras research team then used "9,000 small units of reinforced concrete structure with holes" according to the paper. The concrete structures were being used for reviving an island for the first time in the world.

The team led by the Head of Department of Ocean Engineering at IIT Madras - Prof S A Sannasiraj, worked with Tuticorin based Suganthi Devadason Marine Research Institute to build and study small scale models and accordingly strategize the rehabilitation.

Date: 5th August 2017

Publication: Outlook

Edition: Online

Journalist: NA

Professor: Prof SA Sannasiraj

**Headline: IIT-Madras Researchers Rebuilding An Island Once Red-Flagged By Tamil Nadu Govt**

URL: <https://www.outlookindia.com/website/story/iit-madras-researchers-rebuilding-an-island-once-red-flagged-by-tamil-nadu-govt/300062>

### **IIT-Madras Researchers Rebuilding An Island Once Red-Flagged By Tamil Nadu Govt**

In just two years, an IIT-Madras team of five researchers has grown an island back to life after it had shrunk from 16 hectares in 1986 to 1.5 hectares in 2015.

Today, Vaan Island -- 12 km off the Tuticorin coast in Tamil Nadu and one of 21 uninhabited islands in the Gulf of Mannar -- is back to a size of 1.64 hectares, a growth of 7.6% with the help of "artificial reefs", reported The Indian Express.

A 2014 database of the Tamil Nadu government red-flagged the Vaan Island, mentioning the submergence of one-fourth area of the island. The database blamed coral mining, biotic intrusion from Tuticorin town and frequent fires by fishermen for the shrinking island.

The Gulf of Mannar, which was declared a marine biodiversity park in 1986, has the chain of 21 islands and adjoining coral reefs off the coast of Ramanathapuram and Tuticorin forming the core.

The restoration of Vaan Island is one the climate adaptation projects funded by the National Adaptation Fund for climate change of the ministry of environment, forests and climate change. The state has been given Rs 25 crore for the project.

According to the report, the IIT team was asked to enable the rehabilitation of coral reef, while also reducing the erosion on the island. The team then used "9,000 small units of reinforced concrete structure with holes". The concrete structures were being used for reviving an island for the first time in the world.

The team led by the head of department of ocean engineering at IIT Madras Prof SA Sannasiraj, worked with Tuticorin based Suganthi Devadason Marine Research Institute to build and study small scale models and accordingly strategize the rehabilitation.

"We worked out the design, the build, how to place it, studied waves and determined where to place the structures," Sannasiraj told The Indian Express.

The holes in the concrete structure are required for marine growth. It only took eight months for corals to start growing on these structures, he added.



Date: 5th August 2017

Publication: First Post

Edition: Online

Journalist: NA

Professor: Prof. SA Sannasiraj

**Headline: Beat this! IIT Madras team grows an island off Tamil Nadu coast to arrest erosion**

URL: <http://www.firstpost.com/india/beat-this-iit-madras-team-grows-an-island-off-tamil-nadu-coast-to-arrest-erosion-3893501.html>

### **Beat this! IIT Madras team grows an island off Tamil Nadu coast to arrest erosion**

A team of researchers from the Indian Institute of Technology, Madras has been growing an island off the Tamil Nadu coast since 2015. Called Vaan Island, it is located two kilometres off the Tuticorin coast in the southern state, according to a The Indian Express report.

The Tuticorin coast was partially submerged due to coral mining and before the IIT team began its experiment, the island had shrunk from 16 hectares in 1986 to 1.5 hectares in 2015. After helping the island gain mass by 7.6 percent, the IIT team has ignited hopes of protecting it.

The island is among the 21 uninhabited islands in the Gulf of Mannar, which is located between India and Sri Lanka. Notably, it is the first marine biosphere reserves in Asia and was created by the Indian government in 1989.

In 2014, Tamil Nadu's Environment Department approached IIT Madras with a request to find a solution to protect the island.

The team's aim is to control the erosion of the island and facilitate coral rehabilitation in surrounding areas, India.com reported. "Coral mining was once rampant in this area, and that combined with rising sea levels have over the years harmed the island," H Malleappa, director, Environment Department was quoted in The Indian Express report.

IIT Madras had informed the state government that the project will not affect the nearby Koswari Island. "We worked out the design, the build, how to place it, studied waves and determined where to place the structures," said Professor SA Sannasiraj, head, Department of Ocean Engineering, IIT Madras.

Date: 5th August 2017

Publication: Outlook

Edition: Online

Journalist: Bhavya Khullar

**Headline: For Future Cancer Drugs, Scientists Look To Clues From Outer Space**

URL: <https://www.outlookindia.com/website/story/for-future-cancer-drugs-scientists-look-to-clues-from-outer-space/300059>

### **For Future Cancer Drugs, Scientists Look To Clues From Outer Space**

A group of Indian scientists has figured out the mechanism of cancer cells dying under microgravity, and believe that this can be used to find new drugs in future.

Microgravity conditions experienced by astronauts in space induce stress and strain around human cells. Cancer cells have also been known to die under microgravity. Scientists are exploring if this knowledge can be used to develop novel ways to find new drugs.

A group of Indian scientists has figured out the mechanism of cancer cells dying under microgravity, and believe that this can be used to find new drugs in future.

The research group at Indian Institute of Technology Madras subjected cultured colorectal cancer cell lines to microgravity and observed that they die within 48 hours. Cancer cells died due to apoptosis, which is death induced by cancer cells themselves in response to stress. For simulating microgravity conditions, an equipment called Rotational Cell Culture System-High Aspect Ratio Vessel was used.

“Cancer cells initiate their own death, it is also called programmed cell death. They did so by increasing the levels of two proteins called PTEN and FOXO3 and reducing the levels of another protein, Akt, when they experienced microgravity,” researchers said.

When brought back to normal gravity conditions, they stopped dying and started proliferating again which is their ‘normal’ state, Professor Rama Shanker Verma, who led the study, told India Science Wire. However, the time taken for cancer cells to start proliferating again was longer- nearly three weeks as opposed to less than a week when they do not experience any microgravity, added Raj Pranap Arun, a member of the research team which published its findings in journal Scientific Reports.

“We can exploit the properties of cancer cells under microgravity to find potential drug targets”, believes Professor Verma. The team is now extending the work to cancer stem cells that are responsible in cases of relapse.

Syed Ehtesham Hasnain, professor at Jamia Hamdard Institute of Molecular Medicine, New Delhi, who is not connected to the study, commented that “it is a long way to find a new drug against cancer. But this study has taken an interesting route to address a fundamental problem and may help identify novel drug targets to intervene against cancer.”

The research team also included Divya Sivanesan and Prasanna Vidyasekar from IIT Madras and National University of Singapore. (India Science Wire)

Date: 6th August 2017

Publication: The Hindu

Edition: Delhi/Hyderabad/Kochi/Mumbai/Chennai/Kolkata

Page no.: 1

Journalist: Dr R Prasad

Professor: Prof. T Pradeep

**Headline: When silver 'grows' in paddy fields**

URL: <http://www.thehindu.com/sci-tech/agriculture/when-silver-grows-in-paddy-fields/article19437487.ece>

## When silver 'grows' in paddy fields

*A rice variety originally from West Bengal is able to accumulate the metal in its grain. IIT researchers find*

R. PRASAD  
CHENNAI

It is a rice variety with a silver touch, literally. Garib-sal, one of 505 types of rice plants tested by scientists, is capable of absorbing silver found naturally in soil and accumulating it in the grain to unusually high levels of 15 mg per kg.

The rice was able to accumulate high quantities of silver even when the soil contained only about 0.15 mg per kg.

The unusual accumulation of silver in the grain and other parts of the plant, researchers say, throws open the possibility of commercial extraction of



The rice is put to the test in the field. •SPECIAL ARRANGEMENT

the metal through farming.

The maximum concentration of silver in the plant is in the grains. Silver accumulation is largely in the bran of the rice grain,

and once polished, the silver in the grain is reduced significantly.

### Polishing grain is crucial

It is not, however, for consumption as food. "We do not advocate consumption of the unpolished rice as staple food. If the rice is polished very well then it may not lead to silver toxicity," says Prof. T. Pradeep from the Department of Chemistry, Indian Institute of Technology Madras, who authored the research.

Silver is not known to accumulate in the reproductive tissues of any cereal, and in agricultural

crops the amount of silver that gets accumulated is less than 1 mg per kg of dry weight of the plant.

Researchers at IIT Madras stumbled upon the rice variety while screening for different metal ions in the 505 rice varieties. Only nine showed high silver accumulation, with Garib-sal the highest.

The rice varieties are maintained by Dr. Dehal Deb, head, Centre of Interdisciplinary Studies, Kolkata, as part of rice variety conservation efforts. Garib-sal used to be grown by farmers in Purulia, West Bengal. The researchers tested Garib-sal's ability to

accumulate silver even when grown in soils with very low silver concentration. Even when the soil contains only about 0.01 mg of silver per kg, the rice plant was able to concentrate 0.20 mg of silver per kg in the grains.

"The rice variety has the ability to accumulate silver about 100 times more than any other rice," says Prof. T. Pradeep. The variety was cultivated in the farm for three successive years in soil containing about 0.15 mg per kg and the uptake and accumulation of the noble metal was nearly the same.

Garib-sal accumulated 50 times more silver than another type in control tests.

Date: 6th August 2017

Publication: The India Saga

Edition: Online

Journalist: Bhavya Khullar

**Headline: For Future Cancer Drugs, Scientists Look To Clues From Outer Space**

URL: <http://theindiasaga.com/social-sector/for-future-cancer-drugs-scientists-look-to-clues-from-outer-space>

### **For Future Cancer Drugs, Scientists Look To Clues From Outer Space**

Microgravity conditions experienced by astronauts in space induce stress and strain around human cells. Cancer cells have also been known to die under microgravity. Scientists are exploring if this knowledge can be used to develop novel ways to find new drugs.

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The research team also included Divya Sivanesan and Prasanna Vidyasekar from IIT Madras and National University of Singapore. (India Science Wire)

Date: 6th August 2017

Publication: Kashmir Times

Edition: Online

Journalist: NA

Professor: Prof. SA Sannasiraj

**Headline: IIT-Madras researchers rebuilding an Island once red-flagged by Tamil Nadu govt**

URL: <http://www.kashmirtimes.in/newsdet.aspx?q=69921>

### **IIT-Madras researchers rebuilding an Island once red-flagged by Tamil Nadu govt**

TAMIL NADU, Aug 3 (Agencies): In just two years, an IIT-Madras team of five researchers has grown an island back to life after it had shrunk from 16 hectares in 1986 to 1.5 hectares in 2015.

Today, Vaan Island -- 12 km off the Tuticorin coast in Tamil Nadu and one of 21 uninhabited islands in the Gulf of Mannar -- is back to a size of 1.64 hectares, a growth of 7.6% with the help of "artificial reefs", reported The Indian Express.

A 2014 database of the Tamil Nadu government red-flagged the Vaan Island, mentioning the submergence of one-fourth area of the island. The database blamed coral mining, biotic intrusion from Tuticorin town and frequent fires by fishermen for the shrinking island.

The Gulf of Mannar, which was declared a marine biodiversity park in 1986, has the chain of 21 islands and adjoining coral reefs off the coast of Ramanathapuram and Tuticorin forming the core.

The restoration of Vaan Island is one the climate adaptation projects funded by the National Adaptation Fund for climate change of the ministry of environment, forests and climate change. The state has been given Rs 25 crore for the project.

According to the report, the IIT team was asked to enable the rehabilitation of coral reef, while also reducing the erosion on the island. The team then used "9,000 small units of reinforced concrete structure with holes". The concrete structures were being used for reviving an island for the first time in the world. The team led by the head of department of ocean engineering at IIT Madras Prof SA Sannasiraj, worked with Tuticorin based Suganthi Devadason Marine Research Institute to build and study small scale models and accordingly strategize the rehabilitation.

"We worked out the design, the build, how to place it, studied waves and determined where to place the structures," Sannasiraj told The Indian Express.

The holes in the concrete structure are required for marine growth. It only took eight months for corals to start growing on these structures, he added.

Date: 7th August 2017

Publication: Millennium Post

Edition: Delhi/Kolkata

Page no.: 8

Journalist: Dinesh C Sharma

Headline: Saving sinking islands

URL: <http://www.millenniumpost.in/opinion/saving-sinking-islands-256380>

## Saving sinking islands

*Deploying artificial reefs parallel to the sinking islands reduces the effect of currents and natural corals fuse over time to start regeneration, explains Dinesh C Sharma*

**Artificial reefs (made of concrete) have been discovered to be capable of preventing further erosion of ecologically sensitive islands and regenerating coral biodiversity in the Gulf of Mannar**

Sinking islands may become a reality with the danger of rising sea levels and climate change being accentuated in the decades to come. Tamil Nadu has hit upon a novel idea to protect such islands on its coast—deploying artificial reefs near vulnerable islands.

Artificial reefs, made of concrete, have been discovered to be capable of preventing further erosion of ecologically sensitive islands and regenerating coral biodiversity in the Gulf of Mannar. "We have successfully demonstrated this in Vaan Island in the Mennar region. The island which had sunk to a great extent over the last few decades has regained some of its area," said H Malleshappa, head of the Tamil Nadu State Climate Change Cell.

Vaan is one of the 21 islands in the Gulf of Mannar, which was declared as a marine biodiversity park in 1986. Indiscriminate mining of coral and destructive fishing practices in the past decades have fully submerged two islands. Vaan was on the verge of submergence when the project began in 2015. Its area had been reduced from 16 hectares in 1986 to 2 hectares in 2014. "Following the deployment of artificial reefs, new accretion has occurred," Malleshappa told India Science Wire on the sidelines of a workshop on climate change.

The area of Vaan Island has increased by 2.24 hectares in low tide and 1.8 hectares in the mean tide, between Decem-



Artificial reef could protect vulnerable marine ecosystems

[Representational Image]

ber 2015 and August 2016. The restoration of Vaan Island is one of the climate adaptation projects funded by the National Adaptation Fund for Climate Change of the Ministry of Environment, Forests and Climate Change. The state has been given Rs 25 crore for the execution of this project.

It is the first attempt in India to protect and restore a sinking island. Deployment of artificial reefs parallel to the sinking island on the seaward side reduces the effect of currents and waves, enhances fish habitats for higher fish production and also assists in the protection of fish diversity. Natural

corals get attached to artificial reefs over time and start regeneration. Following the success in Vaan, Tamil Nadu has proposed to undertake the restoration of two more islands and has approached Green Climate Fund for a funding of Rs 100 crore.

The first two phases of the project were funded by the Tamil Nadu Coastal Zone Protection Authority, starting in February 2015. The project had two components in these phases—coral rehabilitation and artificial reef deployment. In the first phase, three square kilometres of degraded area around the island was reha-

bilitated with native coral species using standard coral transplantation techniques. Rehabilitated coral sites were monitored regularly to document survival and growth of the transplanted corals. The survival rate is 80 to 90 per cent and spawning has been observed in transplanted corals. The coral rehabilitation project was started with technical expertise from the Suganti Devadasan Marine Research Institute.

None of the islands are inhabited but they support livelihoods. Therefore, one of the key objectives of the project is to undertake eco-devel-

opment activities among coastal communities to enhance their adaptive capacity, Malleshappa added. In the second phase, artificial reefs were deployed. For this, the Indian Institute of Technology Madras (IIT-M) conducted wave dynamic and bathymetry studies. Based on this, the design, was finalised and locations were identified for deploying artificial reef modules. Each module is 2.5 meter in width, 2 meter in height and 1 meter in longitudinal length, and weighs 1.8 tonnes. The concrete reefs have been deployed 250 meters from the island in a semi-circular constellation. In the first two phases, 4,600 modules have been deployed in eight months. Now with the funding from the Adaptation Fund, the plan is to take the total number of artificial reefs to 10,000 in two layers.

Though the reason for the erosion of islands is a combination of several factors, experts point out that sea level rise due to climate variation is posing an additional threat to coastal islands. "Low-lying coastal areas are more vulnerable to impacts of climate change as they are highly prone to inundation as a result of sea-level rise," observed K Palanivelu, director of the Centre for Climate Change and Adaptation Research at Anna University.

2016 01 04 01

(The author is a journalist and columnist. This article was first published on India Science Wire. The views expressed are strictly personal.)

Date: 11th August 2017

Publication: Telangana Today

Edition: Online

Journalist: NA

Professor: Prof Bhaskar Ramamurthi & Prof Prafulla Kumar Behera

**Headline: IIT-Madras to host dedicated Silicon Detector R&D and Application Centre**

URL: <https://telanganatoday.com/iit-madras-silicon-detector>

### **IIT-Madras to host dedicated Silicon Detector R&D and Application Centre**

Hyderabad: The Indian Institute of Technology Madras is going to host a dedicated Silicon Detector Research & Development and Application Centre, a statement from the institute said.

It is intended to aid in upgrading the Compact Muon Solenoid (CMS) Detector.

The CMS Experiment, known worldwide for the discovery of Higgs boson, is one of the largest international scientific collaborations in history, involving more than 3,500 scientists, engineers, and students from 202 institutes in 47 countries.

IIT-Madras hosted an India-CMS collaboration meeting from August 4 to August 6, with more than 80 delegates taking part. Such a meeting was held for the first time.

Prof Bhaskar Ramamurthi, director of IIT Madras, inaugurated the meeting on August 5, along with Prof V Subramanian, acting head, Department of Physics.

During the meeting, all collaborating institutes reviewed the progress till date and discussed the plans for future activities in the CMS Experiment.

IIT-Madras joined India-CMS as well as the CMS collaboration at Geneva, Switzerland, as a full member in 2014, becoming the first and only IIT with such membership.

IIT-Madras is offering a summer internship at CERN for undergraduate students since 2015.

According to Prof Prafulla Kumar Behera, who leads CMS initiative in the Institute, "The main purpose of this centre is to effectively work with Indian collaborating institutes to build a '2,000 silicon detector module' that will be part of CMS detector at CERN."

The estimated cost of setting up the centre is about Rs 6 crore. Around half of the project cost is expected to be funded by CERN, with the rest coming from the Department of Science and Technology, Government of India.

The support of IIT-Madras alumni would also be sought in this undertaking. The modalities are still being worked out.



The Centre will purchase advanced machine tools, such as 6-axis micro-abrasive waterjet machine tool, to be part of the laboratory. They will be first of their kind in India and would help the country's manufacturing sector with cutting-edge research.

"It would also contribute to Prime Minister Narendra Modi's 'Make-in-India' campaign, as these advanced equipment will boost the manufacturing sector in India. The Advanced Characterization Facilities for Silicon Sensor will also be part of this Centre," says Prof Prafulla Kumar Behera.

The funds are expected to be released by early 2018 and the Centre is slated to be operational by end of 2018.

The Silicon sensor has several potential spinoff applications such as coming up with better medical imaging that will aid the Indian healthcare sector.

The IIT-Madras-CMS Group will have three faculties, one postdoctoral student, six doctoral students and six Undergraduate/Master students. Once the laboratory becomes operational, several technical staff would also be recruited.

IIT-Madras has two of its departments (Physics and Mechanical) working for CMS detector upgrade at the moment. There is a possibility of others, such as the Departments of Computer Science and Engineering, Electrical Engineering, Metallurgical and Materials Engineering, joining this centre. They would contribute to detector upgrade as well as data mining activities at CERN.

India became an associate member of CERN in 2016 and it opens an opportunity for the country to be a collaborator at CERN.

Indian physicists have been part of the research collaboration from the beginning and contributed to the detector development, computing and data analysis.

India-CMS collaboration has nine full member institutes (BARC, TIFR, SINP, NISER, PU, DU, IIT Madras, IISc and IISER Pune) and has about 45 faculties and same number of Ph.D students.

Date: 11th August 2017

Publication: QS Wow News

Edition: Online

Journalist: NA

Professor: Prof T Asokan

**Headline: IIT Madras faculty file patent for surgical robot**

URL: <http://www.qswownews.com/2017/08/10/iit-madras-faculty-file-patent-surgical-robot/>

### **IIT Madras faculty file patent for surgical robot**

India – Surgical robots are increasingly being used in India in recent years. However, the benefit of this technology is extremely limited at present, as this equipment is very expensive and only a few medical institutions could afford to purchase it.

Consequently, the number of doctors who are trained in using this system are very few. Even at global levels, there are few companies that manufacture robots for surgeries.

Viewing this as a serious lacuna, Prof T Asokan, Department of Engineering Design, Indian Institute of Technology Madras (IIT Madras), started a research project to create a surgical robot for training purposes. The effort, launched in collaboration with a medical institution and an industry, both of which are based at Coimbatore in Tamil Nadu, resulted in the successful development of a “training robot”.

Speaking about his work, Prof Asokan says: “We’ve made a proof-of-concept prototype and demonstrated it successfully to a team from the Department of Science and Technology, Government of India, as well as to a few robotic surgeons. We’re now working on improving the design and making it more user-friendly. A few patents have already been filed.”

Explaining the project, he says the device comprises of a “master arm” and a “slave arm”. The doctor will work on the master arm. The slave arm will follow the motions of the master arm. The slave arm also has a camera attached to it. The doctor will watch the images, transmitted by the camera, in real time on a computer screen and perform the procedure.

The benefits of such devices are that it will allow for very precise surgery and can be used to perform very complex operations with minimal incisions.

The current design of the robot is aimed at abdominal surgeries. Hence, the IIT Madras team worked with a team of urologists from PSG Medical College, Coimbatore while designing it.

Explaining the economics of the project, he informs that a Robot used for surgery would cost anywhere between INR 120 million and INR 150 million, the training robot created by IIT-M will be around INR 6–7 million. The vision is to have at least one trainer robot in every medical college in India.

“Furthermore, we’re looking for a partner from the medical/robotic industry to convert this training robot for surgeries into an actual robot that can perform surgeries itself. Even with this upgrade, the cost will be much lower than the existing models,” adds Prof Asokan.

As of now, according to him, the equipment has not been used even for experimental procedures on animals. Once the device goes through improvements, it will be taken to the Medical Council of India. Their approval is required before taking it to medical practitioners.

“We are also looking for an industry partner to help us scale this up. While we can make prototypes and demonstrate functionality, we need the industry to really take up on to the society and mass produce it,” concludes Prof Asokan.

Date: 12th August 2017

Publication: India Education Diary

Edition: Online

Journalist: NA

Professor: Prof. Bhaskar Ramamurthi & Prof. Prafulla Kumar Behera

**Headline: IIT-Madras to host dedicated Silicon Detector R&D and application centre**

URL: <http://indiaeducationdiary.in/iit-madras-host-dedicated-silicon-detector-rd-application-centre/>

### **IIT-Madras to host dedicated Silicon Detector R&D and application centre**

This will aid in upgrading Detector for CMS experiment, known worldwide for discovery of Higgs boson

Chennai: Indian Institute of Technology Madras is going to host a dedicated Silicon Detector Research & Development and Application Centre. It is intended to aid in upgrading the Compact Muon Solenoid (CMS) Detector.

CMS experiment, known worldwide for the discovery of Higgs boson, is one of the largest international scientific collaborations in history, involving more than 3,500 scientists, engineers, and students from 202 institutes in 47 countries.

Towards this, IIT-Madras hosted an India-CMS collaboration meeting from 4th to 6th August 2017, with more than 80 delegates taking part. IIT-Madras hosted the India-CMS Collaboration meeting for the first time.

Prof. Bhaskar Ramamurthi, Director, IIT Madras, inaugurated the meeting on 5th August 2017, along with Prof. V. Subramanian, Acting Head, Department of Physics, IIT-Madras. During this meeting, all the collaborating institutes reviewed the progress till now and discussed the plans for future activities in the CMS Experiment

IIT-Madras (the only IIT which is a full member of CMS experiment) joined India-CMS as well as the CMS collaboration at Geneva, Switzerland as a full member in 2014. IIT-Madras is offering a summer internship at CERN for undergraduate students since 2015.

According to Prof. Prafulla Kumar Behera, Associate Professor, Department of Physics, IIT-Madras, who leads CMS initiative in the Institute, "The main purpose of this centre is to effectively work with Indian collaborating institutes to build a '2000 silicon detector module' that will be part of CMS detector at CERN."

The estimated cost of setting up the centre is around Rs. 6 crore. Around half of the project cost is expected to be funded by CERN for the equipment with the rest coming from the Department of Science and Technology, Government of India. The support of IIT-Madras alumni would also be sought in this undertaking. The modalities are still being worked out.

The Centre will purchase advanced machine tools such as 6-axis micro-abrasive waterjet machine tool to be part of the laboratory. They will be first-of-its-kind in India and would help the country's manufacturing sector to do cutting-edge research.

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Professor: Prof. Bhaskar Ramamurthi & Prof. Prafulla Kumar Behera

**Headline: IIT-M gets new silicon detector centre**

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### **IIT-M gets new silicon detector centre**

Hyderabad: Indian Institute of Technology-Madras is going to host a dedicated Silicon Detector Research & Development and Application Centre. It is intended to aid in upgrading the Compact Muon Solenoid (CMS) Detector.

CMS experiment, known worldwide for the discovery of Higgs boson, is one of the largest international scientific collaborations in history, involving more than 3,500 scientists, engineers, and students from 202 institutes in 47 countries.

Towards this, IIT-Madras hosted an India-CMS collaboration meeting from August 4th to 6th 2017, with more than 80 delegates taking part. IIT-M hosted the India-CMS Collaboration meeting for the first time.

Prof Bhaskar Ramamurthi, Director, IIT Madras, inaugurated the meeting on along with Prof V Subramanian, Acting Head, Department of Physics, IIT-Madras.

During this meeting, all the collaborating institutes reviewed the progress till now and discussed the plans for future activities in the CMS Experiment. IIT-Madras (the only IIT which is a full member of CMS experiment) joined India-CMS as well as the CMS collaboration at Geneva, Switzerland as a full member in 2014. IIT-Madras is offering a summer internship at CERN for undergraduate students since 2015.

According to Prof Prafulla Kumar Behera, Associate Professor, Department of Physics, IIT-Madras, who leads CMS initiative in the Institute, "The main purpose of this centre is to effectively work with Indian collaborating institutes to build a '2000 silicon detector module' that will be part of CMS detector at CERN."

The estimated cost of setting up the centre is around Rs. 6 crore. Around half of the project cost is expected to be funded by CERN for the equipment with the rest coming from the Department of Science and Technology, Government of India. The support of IIT-Madras alumni would also be sought in this undertaking. The modalities are still being worked out.

The Centre will purchase advanced machine tools such as 6-axis micro-abrasive waterjet machine tool to be part of the laboratory. They will be first-of-its-kind in India and would help the country's manufacturing sector to do cutting-edge research. The Silicon sensor has several potential spinoff applications such as coming up with better medical imaging that will aid the Indian healthcare sector.

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Journalist: Huma Siddiqui

**Headline: After ISRO launches its satellite successfully, Chile looks to work with IIT**

URL: <http://www.financialexpress.com/india-news/after-isro-launches-its-satellite-successfully-chile-looks-to-work-with-iit/805024/>

## After successful launch of its satellite by ISRO, Chile looks to work with IIT

HUMA SIDDIQUI  
New Delhi, August 11

**CHEAPER AND CREDIBLE** launches and India's overall expertise is driving South American countries towards the Indian Space and Research Organisation (ISRO) for launching their satellites. For launching its first homemade palm-sized satellite, the University of Chile got a ride onboard the Polar Satellite Launch Vehicle (PSLV) C38 rocket recently. The faculty of the university is in talks with professors at IIT-Madras for doing joint missions.

Confirming the launch, Indian ambassador to Chile Anita Nayar told *FE*: "One launch, of SUCHAI, the nano-satellite of the University of Chile, was successfully accomplished by ISRO at the end of June 2017. The SUCHAI project is a standardised satellite of Cubesat type of 1 litre of volume and 1 kg of weight. It is the first satellite built in Chile by students at the university."

"This is an important milestone for the University of Chile space programme, which currently includes the construction of other two (3 litres each) nano-satellites," Nayar added.

The PSLV C38 rocket is an ex-



The University of Chile had initially approached Holland-based Innovative Solutions In Space to help with the launch of its satellite on the Falcon rocket of SpaceX. However, after waiting for two years, ISRO was approached

pendable launch system developed and operated by ISRO. In June this year, it carried 31 satellites — 29 of them belonging to other countries, including Chile.

Talking to *FE*, Marcos Diaz of the university's electric engineering department, which built the satellite, said, "Chile does not have a space programme, hence no space agency. The Chilean air force has some resources to buy a satellite — mostly for earth-observation purposes. However, they do not participate either in the design or the construction. When

the Chilean air force wants a satellite, they usually get it custom built. The government of Chile is not sure if there is any value in having our own space programme."

The University of Chile had initially approached Holland-based Innovative Solutions In Space to help with the launch of their satellite on the 'Falcon' rocket of SpaceX, which is owned by billionaire Elon Musk. However, after waiting for two years, ISRO was approached.

Responding to a question on

how the university got into making satellites, Diaz said, "In the absence of any civilian opportunities for developing satellites, we have started our own space programme to show that we can do our research with low resources and in particular we are focusing on nano-satellite technology, to develop our skills in the subject, do research and take advantages of our geographic position."

"We are trying to get support for the launch of two 3U Cubesats under construction expected to be ready by 2018. Once the funding comes, we hope to get a ride on the PSLV in 2019 for a launch," said Diaz.

Since the university is relying on scientific grants for the development of satellites, "Working with the faculty of IIT Madras would mean constellations of similar nano-satellites. In this way we can enlarge our constellation collaborating with each other, then improving our science outcomes and reducing the costs of our projects," he added.

Adding, "Our geographical distances also can be of great advantage. Thus, our projects could take advantage of ground stations in India and Chile."

These satellites are for space research and scientific in nature.

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**Headline: Silicon Detector**



## **SILICON DETECTOR**

Indian Institute of Technology (IIT) Madras is setting up dedicated Silicon Detector Research & Development and Application Centre, worth around Rs. 6 crore of which around half is expected to be funded by CERN. The centre is intended to aid in upgrading the Compact Muon Solenoid (CMS) Detector. CMS experiment known for discovery of Higgs Boson, involves over 3,500 scientists, engineers, and students from 202 institutes in 47 countries.



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Alumni/students: Adithya Vinoth, Ashutosh Kumar & Aravind Rao

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**”இது தானா சேரும் கூட்டம்!” - அணி சேர்த்து ஆச்சரியப்படுத்தும் ஸ்வாரம் ட்ரோன்ஸ் #Drones**

எதிர்காலத்தில் உலகை கலக்கும் தொழில்நுட்பங்கள் என யார் பட்டியலிட்டாலும், அதில் மறக்காமல் இடம்பிடிக்கும் ஒரு பெயர் ட்ரோன். முதலில், வானிலிருந்து எதிரி நாடுகளைக் கண்காணிக்கவும் தாக்கவும் மட்டுமே இருந்த ட்ரோன்களின் பயன்பாடு இன்று ராணுவம், சினிமா, பாதுகாப்பு, பேரிடர் மேலாண்மை, கனிமவள ஆராய்ச்சி, வானிலை ஆராய்ச்சி எனப் பல துறைகளில் ஆதிக்கம் செலுத்தத் தொடங்கியிருக்கிறது. கற்பனைக்கும் எட்டாத உயரம் என்பதற்கு இந்த நூற்றாண்டின் சிறந்த உதாரணம் இந்த ட்ரோன்களே! இப்படி வருங்காலத்தில் பலவிதத்தில் கைகொடுக்கப்போகும் ட்ரோன்களைப் பற்றி கொஞ்சம் விரிவாகத் தெரிந்துகொள்வோம்.



எவையெல்லாம் ட்ரோன்கள்?

Unmanned Aerial Vehicles (UAV) என அழைக்கப்படும் ஆளில்லா வானூர்திகள் அனைத்துமே ட்ரோன்கள்தான். அது சின்ன ரிமோட் கன்ட்ரோலர் மூலம் இயங்கும் குவாட்காப்டராக இருக்கலாம்; அல்லது தீவிரவாதிகளின் தாக்குதல் நடத்தும் பெரிய விமானங்களாக இருக்கலாம். அனைத்துமே ட்ரோன்கள்தான். எப்படி உருவானவை இந்த ட்ரோன்கள்?

முதல் உலகப்போர் சமயத்தில்தான் இந்த ட்ரோன்கள் முதன்முதலாகப் பயன்பாட்டிற்கு வந்தன. போரிலும் ஈடுபடுத்தப்பட்டன. ராணுவ ரீதியான பயன்பாடுகளில் ட்ரோன்கள் கலக்க, தொடர்ந்து பல நாடுகளும் ட்ரோன்களைப் பாதுகாப்பிற்காகப் பயன்படுத்தத் தொடங்கின. எதிரி நாடுகளை உளவு பார்க்க, எதிரி நாடுகளின் இருப்பிடத்தின்வரைபடத்தை உருவாக்க, ரகசியமாகத் தாக்குதல் நடத்த எனப் பல்வேறு ரீதியாகப் பயன்படுத்தப்பட்டது. இப்படித் தொடங்கிய இதன் ட்ரோனின் பயணம் இன்று பலதுறைகளைக் கடந்தும் சென்று கொண்டிருக்கிறது. ட்ரோன்களின் செயல்பாடு மற்றும் அதன் தன்மைகளைப் பற்றி விளக்குகிறார்கள் சென்னை ஐ.ஐ.டி.,யின் ஏரோ கிளப் உறுப்பினர்களான ஆதித்யன் வினோத், ஆஷூ தோஷ் குமார் மற்றும் அரவிந்த் ராவ் ஆகிய மூவரும்.

ட்ரோன்களைப் பொதுவாக இரண்டு வகையாகப் பிரிக்கலாம். நான்கு அல்லது அதற்குமேல் ரோட்டர்கள் (Rotors) கொண்ட காப்டர்கள் (Copters); அல்லது Fixed wing எனப்படும் நிலையான இறக்கைகளைக் கொண்ட விமானங்கள். இந்த இரண்டு வடிவமைப்பிலும் நிறைய மாற்றங்கள், சிறப்பம்சங்கள் சேர்க்கப்பட்டுதான் பிரத்யேக பயன்பாடுகளுக்கான ட்ரோன்கள்தயாராகின்றன.



காப்டர் என்ற ட்ரோன்கள் பல ரோட்டர்கள் மூலம், உந்துசக்தி உருவாக்கப்பட்டு பின்னர் பறக்கும். இதில் அதிக மின்சக்தி தேவைப்படும். எடை அதிகமாக இருக்கும். மேலும் சத்தமும் ஏற்படும். இந்த வகை ட்ரோன்கள் பெரும்பாலும் உள்ளூர்க் அல்லது குறைவான உயரம் கொண்ட பயன்பாடுகளில் பயன்படுத்தப்படும். உதாரணமாக அறைகளைக்கண்காணிக்க உதவும் ட்ரோன்கள், வீட்டை ஸ்கேன் செய்யும் ட்ரோன்கள், பொதுவான கண்காணிப்பு ட்ரோன்கள் போன்றவற்றைக் குறிப்பிடலாம். நிலையான இறக்கைகள் கொண்ட Fixed Wing விமானங்கள் மற்ற துறைகளில் பயன்படுத்தப்படுகின்றன. இந்தவகை ட்ரோன்களில் இன்ஜின் மூலமாக உந்துசக்தி தரப்பட்டு, ஒரே ஒரு புரப்பெல்லர் (Propeller) மூலமாகவே நம்மால் இயக்க முடியும். இதனால் இதைக் குறைவான சத்தத்தில், அதிக உயரத்திலும், வேகத்திலும் செலுத்த முடியும். வேளாண்மை, கண்காணிப்பு, வானிலை ஆராய்ச்சிகள், ராணுவம் போன்றவற்றில் இதுபோன்ற ட்ரோன்கள் பயன்படுத்தப்படும். அமேசானின் ட்ரோன் டெலிவரி முதல் ஷூட்டிங் செய்யும் ட்ரோன்கள் வரை அனைத்திலுமே ஒரே ஒரு ட்ரோனைத்தான் தற்போது பயன்படுத்திக்கொண்டிருக்கிறோம். ஆனால் தற்போது swarm drones எனப்படும் ட்ரோன்களைப் பற்றி நிறைய ஆராய்ச்சிகள் நடந்துவருகின்றன. அதாவது ஒரே ஒரு ட்ரோனை மட்டுமே தனித்து இயக்காமல், குழுவாகப் பல ட்ரோன்களை இயக்கி, குறிப்பிட்ட

பணிகளைச் செய்வதுதான் இந்த ட்ரோன்களின் பணி. எப்படிப் பறவைகள் மற்றும் தேனீக்கள் கூட்டாகப் பறக்கின்றனவோ, அதைப் போலவே இணைந்து பறப்பதுதான் இவற்றின் பணி.

இதற்கு உதாரணமாக பென்சில்வேனியா பல்கலைக்கழக ட்ரோன்கள் ஒன்றிணைந்து, ஜேம்ஸ்பாண்ட் தீம் மியூசிக் வாசித்ததையும், இன்டெல் நிறுவனத்தின் ட்ரோன் வானவேடிக்கையையும் குறிப்பிடலாம். ஒருபக்கம் வாசிப்பதற்கு தயாராக கீ-போர்டு, ட்ரம்ஸ் ஆகியவை ட்ரோன்களுக்கு ஏற்ற சிறப்பு வசதிகளோடு ரெடியாக இருக்கும். மற்றொருபக்கம் ட்ரோன்கள் வாசிப்பதற்கு தயாராக பறந்துவரும். ஒரு ட்ரோனுக்கு கீ-போர்டு, இன்னொரு ட்ரோனுக்கு ட்ரம்ஸ் என ஒவ்வொரு ட்ரோனுக்கும் ஒரு பணி ஒதுக்கப்பட்டு, அதற்கேற்ற வசதிகளோடு வடிவமைக்கப்பட்டு, புரோகிராமிங்கும் செய்யப்பட்டிருக்கும். இவை இணைந்து செயல்படும்போது ஜேம்ஸ்பாண்ட் தீம் மியூசிக் உருவாகும். இதைத்தான் சில வருடங்களுக்கு முன்னர் பென்சில்வேனியா பல்கலைக்கழகம் செய்தது.

இவையெல்லாம் swarm drone-களுக்கான உதாரணம் மட்டும்தான். இன்னும் பலவகையில் இந்த ட்ரோன்களைப் பயன்படுத்த முடியும். உதாரணமாக, ஒரு ட்ரோனால் 10 கிலோகிராம் எடையைத்தான் தூக்கமுடியும் என்றால், அதனால் 20 கிலோ எடையுள்ள பொருளை சுமந்துசெல்ல முடியாது. ஆனால் அந்த ட்ரோனுடன் இன்னொரு ட்ரோனை இணைத்து செயல்படுத்தினால் இரண்டு ட்ரோன்களும் சேர்ந்து அந்தப் பொருளை சுமந்து செல்ல முடியும். ராணுவ தாக்குதலில் ஒரே ஒரு ட்ரோனைப் பயன்படுத்தும்போது, அதை ஏவுகணைகள் மூலமாக எளிதில் தாக்கி அழித்துவிடலாம். ஆனால் பல ட்ரோன்களை கூட்டாக இயக்கும்போது அதற்கான வாய்ப்பு பலமடங்கு குறையும். இதனால் ட்ரோன்கள் காப்பற்றப்படுவதோடு மட்டுமில்லாமல், தாக்குதலையும் துல்லியமாக நடத்தமுடியும். இப்படிப் பல விதங்களில் இந்த swarm drone-களைப் பயன்படுத்த முடியும். ஆனால் சாதாரண ட்ரோன்கள் போல, இவற்றை எளிதில் இயக்கிவிட முடியாது. காரணம் அனைத்து ட்ரோன்களையும் கட்டுப்படுத்துவது, வானில் பறக்கும்போது ஒன்றுடன் ஒன்று தொடர்புகொண்டு அதற்கேற்ப நிலையாகப் பறப்பது, தடைகளை எதிர்கொள்வது என இதில் நிறைய சிக்கல்கள் இருக்கின்றன. இவற்றையெல்லாம் தாண்டிதான் இந்த swarm drones இயங்க வேண்டும். இதற்கான ஆராய்ச்சிகள் தொடர்ந்து நடைபெற்று வருகின்றன.

எப்படி வேறுபடுகின்றன?

பறப்பதற்கான உந்துசக்தியை அளிக்கும் ரோட்டார் அல்லது இன்ஜின், சென்சார்கள், கன்ட்ரோல் யூனிட், ட்ரோனுக்கு சக்தியளிக்கும் பேட்டரி அல்லது எரிபொருள் ஆகியவைதான் ட்ரோன்களின் அடிப்படை அம்சம். இவை இருந்தாலே போதும். சாதாரணமாக ஒரு ட்ரோனை இயக்கமுடியும். ட்ரோன்கள் என்பவை பொதுவாக வானில் பறப்பவை மட்டும்தான். அதில் கேமரா வைக்கிறோமா, துப்பாக்கி வைக்கிறோமா என்பதைப் பொறுத்துதான் அதன் பயன்பாடுகள் மாறும். அப்படிச் சில உதாரணங்களைப் பார்ப்போம்.

1. லேசர் சென்சார்:

அறைகளை ட்ரோன்கள் உதவியுடன் மேப்பிங் செய்வதற்கு இந்த லேசர் சென்சார் உதவும். ஒரு கட்டடத்தில் தீ விபத்து நடந்திருக்கிறது என்றால், அதனுள் அவ்வளவு எளிதில் மனிதர்கள் சென்று அறைகளை நோட்டமிட முடியாது. ஆனால் லேசர் சென்சார்கள் கொண்ட ட்ரோன்களை உள்ளே அனுப்புவதன் மூலம், அந்த அறையின் வடிவத்தை கணினியிலேயே பார்த்துவிட முடியும். எனவே எந்தப் பாதையின் வழியாக செல்லலாம் என்பதுமுதல் அனைத்தையும் நம்மால் முன்கூட்டியே கணிக்க முடியும்.

2. கேமரா:

ஷூட்டிங், மேப்பிங் போன்றவற்றில் கேமராக்களின் பங்கு அளப்பரியது. இதன் மூலமாக நிலப்பரப்பை ஸ்கேன் செய்து, மேப் தயாரிக்கலாம். போட்டோ எடுக்கலாம். காடுகள், பாலவனங்கள், கடல்பரப்புகள் போன்ற இடங்களில் கண்காணிப்புப் பணிகளில் ஈடுபடுத்தலாம்.

### 3. ராணுவ பயன்பாடுகள்:

பெரும்பாலும் ராணுவ பயன்பாடுகளுக்கான ட்ரோன்கள் ஆயுதங்கள் தாங்கியவையாக இருக்கும். அத்துடன் கேமரா, சென்சார் போன்றவையும் இடம்பெற்றிருக்கும்.

### 4. ரோபோட்கள்:

ஒரு கட்டடத்தின் 56-வது மாடியில் ஒரு கண்ணாடி உடைந்திருக்கிறது என வைத்துக்கொள்வோம். அதில் ஒரு மனிதர் ஏறி, அதைச் சரிசெய்வது என்பது கடினமான பணி. ஆபத்தானதும் கூட. ஆனால் ஒரு ட்ரோனில், கன்ட்ரோலர்கள் மூலம் இயங்கும் ரோபோட்டிங் கரங்களை அதில் இணைத்துவிட்டால் கீழிருந்தே சில நிமிடங்களில் அதனை மாற்றிவிட முடியும். இப்படிப் பல இடங்களில் ரோபோக்களை ட்ரோன்களுடன் இணைத்துப் பயன்படுத்தவும் ஆராய்ச்சிகள் நடந்துவருகின்றன.

### 5. சென்சார்கள்:

மேலே பார்த்த தீ விபத்து உதாரணத்தையே மீண்டும் எடுத்துக்கொள்வோம். மனிதர்கள் நுழைய முடியாத அந்தக் கட்டடத்தில் ட்ரோன்களை அனுப்பி, உள்ளே ஆட்கள் இருக்கிறார்களா என நாம் ஆய்வு செய்யலாம். அப்போது அகச்சிவப்பு கதிர்களுக்கான (IR) சென்சாரைப் பயன்படுத்தினால் மனிதர்கள் இருக்கிறார்களா என்பதை கடுமையான புகைமூட்டத்திற்கு நடுவேகூட நம்மால் கண்டுபிடித்துவிட முடியும்.

### பயன்பாடுகள்:

பல தொழில்நுட்பங்கள் ட்ரோன்களில் வந்துவிட்டாலும் இன்னும் நிறைய நாடுகளில் ட்ரோன்கள் கண்காணிப்புப் பணிகளுக்காகத்தான் அதிகளவில் பயன்படுத்தப்படுகின்றன. அடுத்தது தாக்குதல்களுக்கு. அமெரிக்கா ட்ரோன்கள் மூலமாக ஆப்கானிஸ்தான் மற்றும் பாகிஸ்தான் பகுதிகளில் நடத்திய ட்ரோன் தாக்குதல்கள் நிறைய பாராட்டுகளையும், எதிர்ப்புகளையும் ஒருசேர குவித்தது. நிறைய தீவிரவாதிகள் இந்தத் தாக்குதல்களில் கொல்லப்பட்டாலும், கூடவே நிறைய பொதுமக்களும் மாண்டனர். வானில் இருந்து இயங்கும் ட்ரோன்கள் போலவே, ஆழ்கடலில் பாதுகாப்புப் பணிகளில் ஈடுபடுவதற்காக ஆழ்கடல் ட்ரோன்களும் இருக்கின்றன. இதுபோக போட்டோகிராபி போன்ற பொழுதுபோக்குப் பயன்பாடுகளுக்காகவும் பயன்படுத்தப்படுகின்றன.

வேளாண்துறையிலும் ட்ரோன்களின் பங்கு வளர்ந்துகொண்டே வருகிறது. வயலைக் கண்காணிக்க, வானில் இருந்து வயலில் பூச்சிக்கொல்லி மருந்துகள் தெளிக்க என வேளாண்துறையிலும் பயன்பட்டுவருகிறது. எண்ணெய் நிறுவனங்களின் எண்ணெய்க் குழாய்களில் விரிசல்கள் ஏற்பட்டிருக்கிறதா, கசிவுகள் இருக்கிறதா எனவும் பயன்படுவதால் தொழில்துறையிலும் கொஞ்சம் கொஞ்சமாக நுழைந்திருக்கின்றன ட்ரோன்கள். அமேசான் நிறுவனம் ட்ரோன் டெலிவரி செய்ய திட்டமிட்டிருப்பது அனைவரும் ஏற்கெனவே அறிந்ததுதான். இவை போக ஒரு இடத்தின் வரைபடத்தை உருவாக்கவும், தகவல் தொழில்நுட்ப வசதிகளை நீட்டிக்கவும் ட்ரோன்கள் பயன்படுகின்றன. தற்போது ட்ரோன்கள் என்பவை மனிதனின் கட்டுப்பாட்டைக் கொண்டு இயங்குகின்றன. செயற்கை நுண்ணறிவு கொண்ட ரோபோக்கள் போலவே, சுயமாக இயங்கும் ட்ரோன்களும் எதிர்காலத்தில் உருவாகும். இடத்திற்கு ஏற்ப சிந்தித்து செயல்பட வேண்டிய மீட்டிங் பணிகள், ராணுவப்

பணிகள் போன்றவற்றில் இவை பங்களிக்கும். இப்படி இவற்றின் பயன்பாடுகளை சொல்லிக்கொண்டே போகலாம்.



இதில் மட்டும் உஷார்!

எல்லா தொழில்நுட்பங்களுக்குமே சில குறைபாடுகள் இருக்கும். அதேபோல ட்ரோன்களுக்கும் சில குறைபாடுகள் இருக்கின்றன. இதைத் தவறாகப் பயன்படுத்தினால் மற்றவர்களின் பிரைவசி பாதிக்கப்படுவதற்கான சாத்தியக்கூறுகள் இருக்கின்றன. இவற்றை யார் பயன்படுத்துவது, எப்படிப் பயன்படுத்துவது போன்றவை குறித்த முறையான விதிமுறைகள் இந்தியாவில் இன்னும் வகுக்கப்படவில்லை. இங்கே இன்னும் பயன்பாடுகள் அதிகமாகவில்லை என்பதும் குறிப்பிடத்தக்கது. ஆனால் விரைவில் அதற்கான நடவடிக்கைகள் எடுக்கப்படும் என நம்புவோம்.

காணும்போதெல்லாம், கண்ணில் பட்ட காக்கா குருவி போல எதிர்காலத்தில் ட்ரோன்கள் கூட வானில் அங்குமிங்கும் பறந்துகொண்டிருந்தால் கூட ஆச்சரியப்படத் தேவையில்லை. எல்லாம் டெக்னாலஜி!

Date: 18th August 2017

Publication: India Today

Edition: Online

Journalist: Pramod Madhav

Alumni/students: Vivek Vysyaraju, Achu Shankar

**Headline: Meet Aurora 2902, a robot rover built by IIT-Madras students to assist astronauts on Mars**

URL: <http://indiatoday.intoday.in/story/indian-institute-of-technology-madras-iit-m-aurora-2902-mars-rover-society/1/1028044.html>

### **Meet Aurora 2902, a robot rover built by IIT-Madras students to assist astronauts on Mars**

Aurora 2902 is a state-of-the-art rover built for a competition conducted by the prestigious Mars Rover Society.



Students of the Indian Institute of Technology (Madras) have built a robot rover to assist astronauts on Mars in their research. And it's operated using a video-game joystick.

The 50-kg rover, called Aurora 2902, is state-of-the-art. That's impressive, considering the fact that its manufacturing cost didn't exceed Rs 3 lakh.

"We made this rover for a competition called as the University Rover Challenge, conducted by the prestigious Mars Rover Society", said Vivek Vysyaraju, who leads the IIT-M team that built Aurora.

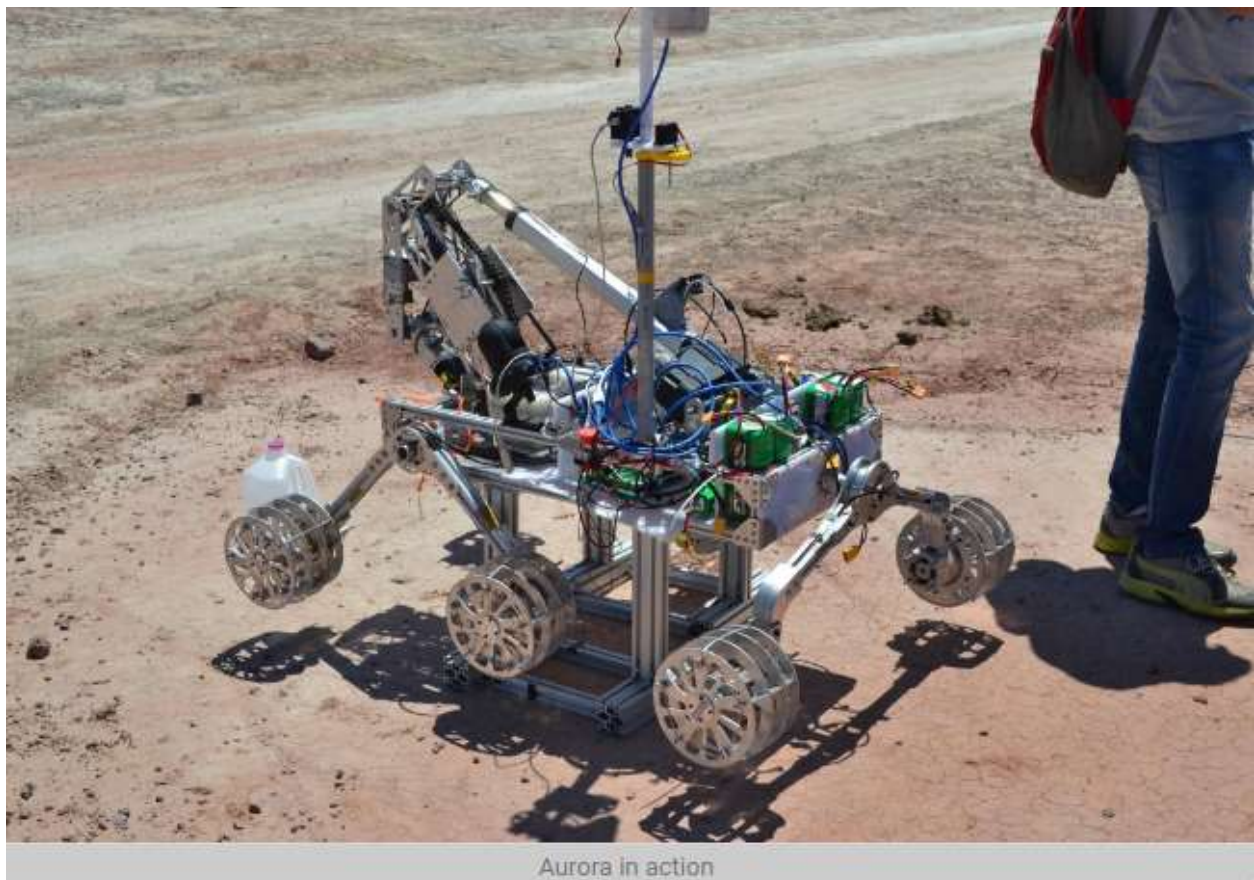
EXPLORERS

Team 'Anveshak' (Sanskrit for explorer) competed with 81 other teams, and scored much better due to the simplicity of their design.

"Though the cost ceiling for the competition was 10 lakh rupees, we finished this working rover under 3 lakh as that was all we could acquire", Vysyaraju explained.

His team used a Raspberry Pi CPU worth Rs 3,000 instead of a motherboard, which would have set them back Rs 15,000.

An added advantage: The CPU freed up space for the aluminium chassis, a space-dust resistant modular design with easily-replaceable parts.



#### MADE FROM SCRATCH

Every part of Aurora - save the motors and lithium polymer batteries - was designed and made from scratch.

To minimize the number of moving parts, futuristic rocky bogey arms were used to connect its six wheels to help steer it.

The rover also possesses a robotic arm with a claw mechanism, which can carry objects weighing upto 5 kg.

"Aurora runs on 4 lithium polymer batteries each holding 10,000 mAh, of which three power 6 wheel motors and one (is) dedicated for the hydraulic arm. She can even carry a load (of) upto 50 kg on her chassis - as per requirement - and we have tweaked her cruise speed between 5 to 10 km/hr", said Achu Shankar, who handles the software input system.

His collaborator Ganga Meghanath said the team focused on making Aurora easy to operate.

"The competition had priorities like taking a soil sample...to test it. So we relied on modules which are easy to assemble, but we made sure that the handling of Aurora should be much easier...that's why we made the controls look as easy as possible. For instance, we are using a video game joystick for controls", he said.

Team Anveshak's ultimate goal is to assist ISRO and other space agencies in their endeavour to send astronauts to Mars, and provide equipment that will make their life easier on the Red Planet's harsh terrain.



Date: 19th August 2017

Publication: The Times of India

Edition: Chennai

Page no. : 4

Journalist: NA

Professor: Prof. Prafulla Kumar Behera

**Headline: IIT Madras builds research facility to help CERN**

URL: <http://timesofindia.indiatimes.com/city/chennai/iit-madras-builds-research-facility-to-help-cern/articleshow/60125988.cms>

## IIT Madras builds research facility to help CERN

TIMES NEWS NETWORK

**Chennai:** Indian Institute of Technology, Madras (IIT-M) is setting up an exclusive centre on its premises for research, and to develop a silicon tracker detector that will go into upgrading the massive 14,000 tonne CMS (compact muon solenoid) detector, which is studying a wide range of physics including the dark matter that makes up the universe. The CMS detector is installed by CERN, the European Organisation for Nuclear Research, in France.

The dedicated Silicon Detector Research and Development and Application Centre to be set up at IIT Madras at a cost of ₹6 crore, will be part of India-CMS collaboration. The Centre is expected to be operational by end of 2018.

"The main purpose of this centre is to work with other Indian collaborating institutes to build a '2000 silicon detector module' that will be part of the CMS detector at CERN," said Prafulla Kumar Behera, associate professor, department of physics, IIT-Madras.

The main CMS detector in France will undergo upgradation in 2025 when the existing silicon tracker detector dies out. The silicon tracker detector is one of the four subdetectors in the main CMS detector. Data from the main detector installed 100m below ground may help scientists understand the evolution of the universe better.

Prof. Behera said the centre not only aims at conducting cutting-edge research with advanced machine tools but will also train students in the process. "IIT-Madras is also offering summer internships at CERN for our undergraduate students since 2015," he said.

Scientists said the sensor that goes into the detector – a technology for which is available only in a few countries – has several potential spinoff applications like medical imaging that can help the Indian healthcare sector. "If we could get such technologies, may be in the future we can use them if we are going to build such detectors in our country," Behera said.

IIT-M became the first IIT to be made a full member of the CMS experiment at CERN in 2014. India became an associate member of CERN in 2016.

Date: 20th August 2017

Publication: ET Tech

Edition: Online

Journalist: NA

Professor: Prof. Prafulla Kumar Behera

**Headline: IIT Madras builds research facility to help CERN**

URL: <http://tech.economictimes.indiatimes.com/news/technology/iit-madras-builds-research-facility-to-help-cern/60131243>

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Date: 21st August 2017

Publication: India Times

Edition: Online

Journalist: NA

Professor: Prof. Prafulla Kumar Behera

**Headline: IIT Madras Builds Particle Detector On Campus To Help CERN Unravel The Mysteries Of Dark Matter**

URL: <http://www.indiatimes.com/technology/news/iit-madras-builds-particle-detector-on-campus-to-help-cern-unravel-the-mysteries-of-dark-matter-328202.html>

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Date: 22nd August 2017

Publication: The Times of India

Edition: Chennai

Page no.: 4

Journalist: NA

Professor: Prof. Abdus Samad

**Headline: IIT Madras turbine may generate power from ocean waves**

URL: <http://timesofindia.indiatimes.com/city/chennai/iit-madras-turbine-may-generate-power-from-ocean-waves/articleshow/60165819.cms>

# IIT-M turbine may generate power from ocean waves

TIMES NEWS NETWORK

**Chennai:** A team of 25 faculty members and students from the ocean engineering department in Indian Institute of Technology Madras have begun testing a prototype of a turbine they have developed which converts wave energy into electricity. The 'impulse' turbine works with a unidirectional rotor powered by a generator. The system will be tested in oceans by the end of the year.

Associate professor Abdus Samad said the turbine prototype was selected from close to 30 different designs with different number of blades in the rotor. All the designs were tested through computer simulations and the design parameters of the turbine was optimized through numerical modelling. The power output for all the turbine designs was calculated before one simple commercially viable design was chosen to be developed into a prototype.



**WAVE ENERGY:** The 'impulse' turbine works with a unidirectional rotor powered by a generator

Unlike wind turbines that generate electricity from wind energy with three blades, the impulse turbine rotors will have more than 20 blades. "We have tested the turbine for a three-minute duration and the data is being analysed," he said. "We have chosen a simple design that has just one moving element so the system is more reliable and lasts longer."

Scientists said the turbine works on a 'oscillating

water column theory' where the system has a water column that acts like a piston moving up and down as the waves hit forcing air out and back into the chamber. This airflow is then converted into energy.

Wave energy has potential to produce 40 GW to supply to the Indian grids, approximately 13% of the total production capacity in India, the team said. Another advantage is that the energy density per square meter of wave energy is 5 and 10 times more than the wind and solar energy, respectively.

Samad said their challenge is to create a design with high efficiency in the midst of extreme weather conditions like tsunami. "There is so far no wave energy converter that has been commercialized anywhere in the world. There are more than 1000 patents in the world including in Japan and Europe for wave energy converters but only a few have been tested," he said.

Date: 22nd August 2017

Publication: ET Energy

Edition: Online

Journalist: NA

Professor: Prof. Abdus Samad

**Headline: IIT Madras turbine may generate power from ocean waves**

URL: <http://energy.economictimes.indiatimes.com/news/power/iit-madras-turbine-may-generate-power-from-ocean-waves/60168105>

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Date: 23rd August 2017

Publication: Energy Infra Post

Edition: Online

Journalist: NA

Professor: Prof. Abdus Samad

**Headline: IIT-M Working On Turbine To Harness 40,000 MW Power Locked In Wave Energy**

URL: <http://energyinfrapost.com/m-working-turbine-harness-40000-mw-power-locked-wave-energy/>

### **IIT-M Working On Turbine To Harness 40,000 MW Power Locked In Wave Energy**

Indian Institute of Technology (IIT)-Madras is working on a turbine that can help bring additional 40 GW of additional electricity, or nearly 13 of the country's generation capacity, to the national grid by harnessing wave energy.

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Date: 26th August 2017

Publication: Chennai Patrika

Edition: Online

Journalist: NA

Professor: Prof. Ravindra Gettu & Prof. Manu Santhanam

**Headline: IITM to organize Conference on Construction Materials and Systems**

URL: <http://news.chennaipatrika.com/post/2017/08/24/IITM-to-organize-Conference-on-Construction-Materials-and-Systems.aspx>

### **IITM to organize Conference on Construction Materials and Systems**

IIT Madras to organize International Conference on Construction Materials and Systems

RILEM Conference comes to India for the first time in its 71-year history

Chennai, 24 August 2017: Indian Institute of Technology Madras(IIT Madras) is all set to host a major International Conference on Construction Materials and Systems as part of RILEM Annual Week. This event is coming to India for the first time in its 71-year history and will be held from 3rd to 8th September 2017.

The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM, from the name in French) was founded in June 1947. Today, the new meaning of the acronym RILEM (Réunion Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages) emphasises its dominant focus on worldwide activities, covering 70 countries.

The mission of the association is to advance scientific knowledge related to construction materials, systems and structures and to encourage transfer and application of this knowledge world-wide.

Speaking about the conference, Dr. Ravindra Gettu, Associate Dean, Industrial Consultancy and Sponsored Research, IIT Madras, and a professor in the Department of Civil Engineering, IIT Madras, said, "That IIT Madras is hosting the Conference when it is coming to India for the first time in its history is a recognition of the efforts of our research groups in areas of construction material and heritage structures."

The conference will be a convergence of key international and national experts in relevant fields and is a major event involving several top researchers in the areas of construction materials and systems. The conference is the flagship event of RILEM Week.

Dr. Manu Santhanam, Professor, Department of Civil Engineering, IIT Madras, and main Conference Organizer, said, "IIT Madras researchers will present their work and recent findings on a new 'limestone calcined clay cement' and on extending the durability of reinforced concrete structures, besides on the safety of historic monuments."

The conference will cover several themes related to construction materials and systems, with the objective being to provide state-of-the-art coverage on cement and asphalt concrete, heritage materials, and building systems.

The Conference has three major goals:

- \* to promote sustainable and safe construction, and improved performance and cost benefit for society,
- \* to stimulate new directions of research and its applications, promoting excellence in construction, and
- \* to favour and promote cooperation at international scale by general access to advanced knowledge.

The technical sessions and special workshops highlight the recent trends in research and development in the areas of concrete science and technology, and the non-destructive assessment and conservation of heritage structures.

Several participants from the industry, both local and international are expected to take part. They would also set up a large exhibition of construction material related products. The interactions and discussions at the conference are expected to significantly contribute to the process of infrastructure development that is currently in full swing in India.

Besides the conference, IIT Madras will also host the RILEM Week at Chennai, where all the standing committees and some of the active technical committees will meet.

Further details about the Conference can be obtained from its website:  
<http://www.rilem2017conference.org/>



Date: 26th August 2017

Publication: India Education Diary

Edition: Online

Journalist: NA

Professor: Prof. Ravindra Gettu & Prof. Manu Santhanam

**Headline: IIT Madras to organize International Conference on Construction Materials and Systems**

URL: <https://indiaeducationdiary.in/iit-madras-organize-international-conference-construction-materials-systems/>

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Date: 27th August 2017

Publication: My Reality

Edition: Online

Journalist: S. Chitra

Professor: Prof. Ravindra Gettu & Prof. Manu Santhanam

**Headline: IIT Madras - International Conference on Construction Materials and Systems from 3rd to 8th September 2017**

URL: <http://www.myreality.in/2017/08/iit-madras-to-organize-international.html>

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Further details about the Conference can be obtained from its website:  
<http://www.rilem2017conference.org/>

Date: 27th August 2017

Publication: Skill Outlook

Edition: Online

Journalist: NA

Professor: Prof. Ravindra Gettu & Prof. Manu Santhanam

**Headline: IIT Madras to organize International Conference on Construction Materials and Systems**

URL: <http://skilloutlook.com/event/iit-madras-organize-international-conference-construction-materials-systems>

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Dr. Manu Santhanam, Professor, Department of Civil Engineering, IIT Madras, and main Conference Organizer, said, "IIT Madras researchers will present their work and recent findings on a new 'limestone calcined clay cement' and on extending the durability of reinforced concrete structures, besides on the safety of historic monuments."

The conference will cover several themes related to construction materials and systems, with the objective being to provide state-of-the-art coverage on cement and asphalt concrete, heritage materials, and building systems.

The Conference has three major goals:

to promote sustainable and safe construction, and improved performance and cost benefit for society,

to stimulate new directions of research and its applications, promoting excellence in construction, and to favour and promote cooperation at international scale by general access to advanced knowledge. The technical sessions and special workshops highlight the recent trends in research and development in the areas of concrete science and technology, and the non-destructive assessment and conservation of heritage structures.

Several participants from the industry, both local and international are expected to take part. They would also set up a large exhibition of construction material related products. The interactions and discussions at the conference are expected to significantly contribute to the process of infrastructure development that is currently in full swing in India.

Besides the conference, IIT Madras will also host the RILEM Week at Chennai, where all the standing committees and some of the active technical committees will meet.

Date: 27th August 2017

Publication: The Times of India

Edition: Chennai

Page no.: 3

Journalist: Amrutha Varshinii

Alumni/student: Sourya Varenya & Niyaz

**Headline: IIT-M team looks to explore red planet with Mars rover built from scratch**

URL: <http://timesofindia.indiatimes.com/city/chennai/iit-m-team-looks-to-explore-red-planet-with-mars-rover-built-from-scratch/articleshow/60238783.cms>

# IIT-M team looks to explore red planet with Mars rover built from scratch

**Amrutha Varshinii**  
@timesgroup.com

**Chennai:** A team of undergraduate students from IIT-Madras are building an ambitious Mars rover from scratch. Only weeks ago, their prototype was tested at the Mars Desert Research Station (MDRS), in Utah, USA. Come next year, an improvised version of the rover will participate in a competition conducted by The Mars Society, an international organisation, competing against the best student-made rovers across the globe.

The rover 'Aurora', hand-picked alongside 34 other models at the competition in July, was tested on the rough, dusty terrain at Hanksville (Utah), the closest imitation to Mars' rocky topography. The proto-



**TRIAL:** The team from IIT tested the prototype in Utah a few weeks ago

type had received an initial alumni funding of ₹3 lakh and will head to competition again next year, aiming for a victory.

The prototype, which is being built almost entirely by hand at the institute's Center for Innovation (CFI), incorporates various technologies and has a diverse team of students from various discipli-

nes building it. With myriad parts including motor-fitted wheels, linear actuator to allow it to move in sharp angles and onboard mini-computer (Raspberry Pi), the rover aims to collect samples from the Mars site and conduct in situ tests.

"We are working with the geotechnical engineering de-

partment at the institute to learn about soil testing techniques, which will be incorporated into the bot," says Sourya Varenya, team leader.

Besides being a fully student-led project, the highlight of the rover is perhaps the fact that it has been programmed by the team which does not have a single computer science/IT student. "We learned programming specifically for the project and handle all the coding ourselves," says Niyaz, a student of chemical engineering.

The model, which is undergoing design changes, will be up against a round of critical review at the institute. The only challenge lies in perfecting the prototype at a much lesser cost than the the funding-ceiling stipulated by Mars Society (₹10 lakh).

Date: 28th August 2017

Publication: Magic Bricks

Edition: Online

Journalist: NA

Professor: Prof. Ravindra Gettu & Prof. Manu Santhanam

**Headline: IIT Madras to organize International Conference on Construction Materials and Systems**

URL: <http://content.magicbricks.com/property-news/industry-buzz/iit-madras-to-organize-international-conference-on-construction-materials-and-systems/94063.html>

### **IIT Madras to organize International Conference on Construction Materials and Systems**

Chennai, 24 August 2017: Indian Institute of Technology Madras (IIT Madras) is all set to host a major International Conference on Construction Materials and Systems as part of RILEM Annual Week. This event is coming to India for the first time in its 71-year history and will be held from 3rd to 8th September 2017.

The International Union of Laboratories and Experts in Construction Materials, Systems and Structures (RILEM, from the name in French) was founded in June 1947. Today, the new meaning of the acronym RILEM (Réunion Internationale des Laboratoires et Experts des Matériaux, systèmes de construction et ouvrages) emphasises its dominant focus on worldwide activities, covering 70 countries.

The mission of the association is to advance scientific knowledge related to construction materials, systems and structures and to encourage transfer and application of this knowledge world-wide.

Speaking about the conference, Dr. Ravindra Gettu, Associate Dean, Industrial Consultancy and Sponsored Research, IIT Madras, and a professor in the Department of Civil Engineering, IIT Madras, said, "That IIT Madras is hosting the Conference when it is coming to India for the first time in its history is a recognition of the efforts of our research groups in areas of construction material and heritage structures."

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Besides the conference, IIT Madras will also host the RILEM Week at Chennai, where all the standing committees and some of the active technical committees will meet.

Further details about the Conference can be obtained from its website:  
<http://www.rilem2017conference.org/>

Date: 28th August 2017

Publication: The Times of India

Edition: Kochi

Page no.: 11

Journalist: Amrutha Varshinii

Alumni/student: Sourya Varenya & Niyaz

**Headline: IIT-M team looks to explore red planet with Mars rover built from scratch**

URL: <http://timesofindia.indiatimes.com/city/chennai/iit-m-team-looks-to-explore-red-planet-with-mars-rover-built-from-scratch/articleshow/60238783.cms>

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**IIT Madras is an innovation and  
entrepreneurship hub**

Date: 9th August 2017

Publication: The Times of India

Edition: Delhi/Mumbai/Bangalore/Chennai/Kolkata/Ahmedabad

Page no.: 12

Journalist: Manash Pratim Gohain

Professor: Prof M Manivannan

**Headline: IIT-M start-up bags \$1 million order from Singapore firm**

URL: <http://timesofindia.indiatimes.com/home/education/news/iit-m-start-up-bags-1-million-order-from-singapore-firm/articleshow/59978479.cms>

# IIT-M start-up bags \$1 million order from Singapore firm

## To Transfer Tech For Virtual Ops

Manash.Gohain  
@timesgroup.com

**New Delhi:** A start-up born at the IIT-Madras Incubation Cell has bagged a million-dollar order from a Singapore-based company to transfer technology used by its first two products. The key focus of the technologies is clinical training using virtual patients so that actual treatment becomes safer.

The two products—"Laparoscopy Surgical Simulator with Haptics Feedback" and "In-Vitro Fertilisation Training Simulation with Haptics Feedback"—are expected to change the way doctors are trained to make the patient safer. While high-end simulators with haptics feedback cost around Rs 3 crore in the international market, these new technologies integrating virtual reality with haptics (interaction involving the sense of touch, home-grown in IIT-Madras' Touch Lab, will cost just about Rs 30-35 lakhs.

The start-up Merkel Haptics was formed in 2011 to convert lab work into products, and Touch Lab at the Applied Mechanics Department of IIT-Madras was founded to re-

## LAB WORKING ON TOUCH SENSE

► Touch Lab at Applied Mechanics Department of IIT-Madras is the **first and unique lab in India working in touch sense (Haptics)**

► **Merkel Haptics is a IIT-Madras start-up now transferred to IIT-Madras research park**

► 'Laparoscopy surgical simulator with Haptics Feedback' using which **surgeons can practise laparoscopic skills**. The technology is home-grown in the Touchlab at IIT Madras in collaboration with CMC Vellore, funded by Department of Electronics and IT (DEITY), resulting in two patents owned by IIT Madras. Merkel has

**FIRST PRODUCTS**  
Fertility simulator for IVF & laparoscopic simulation

licensed these patents from IIT Madras and has converted into a market-ready product with funding from BIRAC/DBT

► 'In-Vitro Fertilisation Training Simulation with Haptics Feedback' using which **clinicians can practise artificial insemination skills**. This product is developed completely in-house in Merkel for the Singapore Company

► Transfer of technology to Singapore-based company, Innov4Sight health and Biomedical Systems Private Limited, for \$1 million

► **10% of sales to accrue to IIT**

search the sense of touch.

Speaking to TOI, the founder and principal investigator of the lab, Prof M Manivannan, said: "The Touch Lab is unique and the only touch lab in India. This project started when I visited CMC Vellore. I was watching how laparoscopic surgery was done. The idea of a laparoscopy surgical simulator with haptics feedback was converted into a PhD thesis and a prototype was developed

in the lab in five years. It was then taken to the company (Merkel) to develop it into a product to make it commercially viable."

The project received Rs 60 lakh from the government. CMC Vellore provided chemical advisory input and carried out the preliminary validation of the product. It was patented in 2012-13.

"The second product - In-Vitro Fertilisation Training

Simulation — has been commissioned by Innov4Sight Health and Biomedical Systems Pvt Ltd, Singapore," said Merkel Haptic Systems Pvt Ltd CEO P B C Paul.

"Our objective is to go for an Indian company transfer so that the Indian customer can afford these products. We went for this Singapore-based company as it has a huge base in India and, also, the company got an order from the Singapore government for the In-Vitro Fertilisation Training Simulation product," Paul added.

"Actual training is happening on real patients and there is always scope for mistakes. This is what is happening in all clinical training, with risk of injury. Our technology will replace the real patient with a virtual patient and doctors can practice on the virtual patient any number of times until they master the skill so that the real patient is safer," Manivannan said.

"The Medical Council of India has made skill labs mandatory. But this virtual technology with haptics feedback is not available in India and foreign companies are making a lot of money," Manivannan added.

According to Paul, these products will not cost more than Rs 35 lakh to Rs 40 lakh. He said this was also "a much better technology and (the need for) after-sales support is almost negligible".

Date: 10th August 2017

Publication: BioSpectrum

Edition: Online

Journalist: NA

**Headline: IIT-M start-up gets \$1 M order from Singapore firm**

URL: <http://www.biospectrumindia.com/news/20/9369/iit-m-start-up-gets-1-m-order-from-singapore-firm.html>

### **IIT-M start-up gets \$1 M order from Singapore firm**

The key focus of the technologies is clinical training using virtual patients so that actual treatment becomes safer.

A start-up born at the IIT-Madras Incubation Cell has bagged a million dollar order from a Singapore-based company to transfer technology used by its first two products. The key focus of the technologies is clinical training using virtual patients so that actual treatment becomes safer.

The two products — "Laparoscopy Surgical Simulator with Haptics Feedback" and "In vitro Fertilisation Training Simulation with Haptics Feedback" — are expected to change the way doctors are trained to make the patient safer.

While high-end simulators with haptics feedback cost around Rs 2 crore in the international market, these new technologies integrating virtual reality with haptics (interaction involving the sense of touch), home-grown in IIT-Madras' Touch Lab, will cost just about Rs 30-35 lakhs.

The start-up Merkel Haptics was formed in 2011 to convert lab work into products, and Touch Lab at the Applied Mechanics Department of IIT Madras was founded to research the sense of touch.

Date: 10th August 2017

Publication: International Business Times

Edition: Online

Journalist: Vanilla Sharma

Professor: Prof M Manivannan

**Headline: IIT-Madras startup cell Merkel Haptics receives Rs 6.4 crore order from Singapore firm**

URL: <http://www.ibtimes.co.in/iit-madras-startup-cell-merkel-haptics-receives-rs-6-4-crore-order-singapore-firm-737793>

### **IIT-Madras startup cell Merkel Haptics receives Rs 6.4 crore order from Singapore firm**

The Indian Institute of Technology – Madras (IIT-M) has received an order for two products made in its start-up cell Merkel Haptics. The order from a Singapore-based firm to transfer technology used in the products is valued at about Rs 6.37 crore (\$1 million) and may turn out to be a key component when it comes to clinical training of professionals.

The two products are Laparoscopy Surgical Simulator with Haptics Feedback and In-Vitro Fertilisation Training Simulation with Haptics Feedback and these are used to train professionals on virtual patients before they work on actual patients, reported the Times of India.

IIT-M's technology is likely to make quite a mark in the market as it is much more reasonable at about Rs 30-35 lakh compared to the high-end simulators with similar functionalities that cost about Rs 2 crore in the international market.

"The Touch Lab is unique and the only touch lab in India. This project started when I visited CMC Vellore. I was watching how laproscopic surgery was done. The idea of a laparoscopy surgical simulator with haptics feedback was converted into a PhD thesis and a prototype was developed in the lab in five years. It was then taken to the company (Merkel) to develop it into a product to make it commercially viable," Prof M Manivannan, the founder and principal investigator at the lab, told TOI.

The project received Rs 60 lakh from the government and CMC Vellore is said to have carried out the validation process of the technology, after which it was patented in 2012-13.

Speaking about the benefits of the technology, Manivannan explained that clinical training often involves actual patients, which is a risky affair as the professionals working on these patients are still learning the process, which also leaves some room for error. With the new technology, this risk gets cancelled out.

"The Medical Council of India has made skill labs mandatory. But this virtual technology with haptics feedback is not available in India and foreign companies are making a lot of money," Manivannan added.

Meanwhile, Merkel Haptic Systems Pvt Ltd CEO P B C Paul said that the product also does not require much of after sales service. He said this was also "a much better technology and (the need for) after-sales support is almost negligible."

Date: 10th August 2017

Publication: Newsable

Edition: Online

Journalist: NA

Professor: Prof M Manivannan

**Headline: Unique IIT-M medical startup to get \$1 million from Singapore-based company**

URL: <http://newsable.asianetnews.tv/tamil-nadu/unique-iitm-medical-startup-to-get-1-million-dollars-from-singapore-based-company>

### **Unique IIT-M medical startup to get \$1 million from Singapore-based company**

A Singapore-based company is all set to invest \$1 million into an IIT-Madras based startup.

The start-up born at the IIT-Madras Incubation Cell will transfer technology used by its first two products which will focus on clinical training using virtual patients so that actual treatment becomes safer.

The two products — ‘Laparoscopy Surgical Simulator with Haptics Feedback’ and ‘In-Vitro Fertilisation Training Simulation with Haptics Feedback’ — are expected to change the way doctors are trained to make the patient safer, reported the Times of India.

While high-end simulators with haptics feedback cost around Rs 2 crore in the international market, these new technologies integrating virtual reality with haptics (interaction involving the sense of touch), home-grown in IIT-Madras' Touch Lab, will cost just about Rs 30-35 lakhs.

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The project received Rs 60 lakh from the government. CMC Vellore provided chemical advisory input and carried out the preliminary validation of the product. It was patented in 2012-13. "The second product - In-Vitro Fertilisation Training Simulation — has been commissioned by Innov4Sight Health and Biomedical Systems Pvt Ltd, Singapore," said Merkel Haptic Systems Pvt Ltd CEO P B C Paul to the Times of India.

"Our objective is go for an Indian company transfer so that the Indian customer can afford these products. We went for this Singapore-based company as it has a huge base in India and, also, the company got an order from the Singapore government for the In-Vitro Fertilisation Training Simulation product," Paul added.

Most of the times doctors are made to practice on real patients and that leaves scope for mistakes. The new technology will replace real patients with virtual patients and a doctor can practice on the virtual patient any number of times.



Date: 12th August 2017

Publication: DT Next

Edition: Chennai

Page no. : 2

Journalist: Vipasha Sinha

Alumni: Mr Kris Gopalakrishnan & Mr Prem Watsa

Headline: Old Boys Network

# OLD BOYS NETWORK

*Rather than severing ties with their educational institutions after graduating, many students are active members of alumni associations. From mentoring next generation of students to funding their alma mater, this network is becoming a source of strength*

**A**t the orientation session held recently at Anna University, a few prominent alumni addressed the gathering of enthusiastic first year students, who are all set to begin the most important journey of their lives. Saravan Krishna M, who passed out in 2015, and is also a member of the alumni association of the College of Engineering, Guindy (CEG), shared his experiences in this competitive world. "Most of the students who come here have a cut off mark of 200 and have excelled in school. They might not know what failure is, as yet. Adult life is difficult and they are likely to face some challenges in the next four years. I asked the students to stand by each other, more so because most of them will be staying away from home," he said, adding that he even touched upon the topic of arrears. "Like a lot of debt can make life

difficult for anyone, too many arrears in subjects can make their college life unpleasant. Not everyone can be a nine pointer, they have their own set of skills. They just have to ensure that they do not pile up the arrears; they will still have time for their hobbies and extra curricular activities," said Saravan, who is currently a manager in a start-up. Not merely the freshers, even students in their second, third and final year need guidance. In fact, the 76 alumni of CEG are organising



Saravan Krishna M, an alumni, addressing students at Anna University

**Many public sector companies are paying well and they look at the GATE scores. Keeping this in mind, we plan to start a GATE academy for Anna University students**  
**M Sekar, Former Dean, Anna University**

We already finished sessions for Civil, Mechanical, Electrical and ECE department students. We have selected four alumni for each department and they will address

sessions for students in the fifth semester, to guide them through their career choices. "Most of them hold high posts and work in major corporate houses. Their experience will be helpful for students to make important decisions. After the common first session, we have organised department-wise sessions.

the students' queries and worries," said M Sekar, from the Class of '76 who went on to become the Dean at the University.

According to him, the common question from the students was about their career choices upon graduation. He said, "We had a speaker at an alumni session who recalled his own experience: he wanted to study further after finishing his graduation. However, his parents wanted him to work. He did not resist them and joined the workforce. However, he eventually quit because he did not like it. He went on to join the Air Force, where he was given the opportunity to study in IIT. He did get to fulfil his dreams."

**The glitter of IT, MNCs:** Students often think that their career is limited to MNCs and IT jobs. "There are plenty of opportunities. For instance, take the Graduate Aptitude Test in Engineering (GATE) examination. There is not much awareness about it. Many public sector companies are paying well and they look at the GATE scores. Keeping this in mind, we plan to start a GATE academy for Anna University students. Instead of paying Rs 40,000 for private coaching, they can take the course here," Sekar further added.

**IIT alumni's endowment fund:** Alumni associations of top universities and colleges are also investing money to fund start-ups. Anna

University has an incubator that is funded by the association. Recently, the Indian Institute of Technology launched a new fundraising platform for raising endowment funds through alumni. Crowd funding is a new initiative of IIT-Madras, which has brought in Rs. 1 crore in retail funds. Around 250 new donors joined the initiative with the average donation size being Rs 35,000. Their alumni and funding under Corporate Social Responsibility (CSR) initiatives have cumulatively helped raise Rs 177 crore in the last eight years, from 5,000 donors.

"The alumni have been instrumental in the growth of IIT-Madras and have made enormous contributions to the Institute over the years. We hosted a summer summit in California in June 2017 to help IIT-Madras connect with Silicon Valley. Over \$ 5 million was collected for the "Gopalakrishnan Deshpande Centre" (GDC), which also came from the alumni. Kris Gopalakrishnan, co-founder of Infosys and IIT-Madras alumnus, gave Rs 30 crore for the Computational Brain Research Centre at IIT-Madras. Generous contribution by Prem Watsa, Chairman of Fairfax Financial Holdings, Canada, helped construct a state-of-the-art Synthetic Track," said a representative from IIT-Madras.

The role of the alumni was discussed by Virander Chauhan, Chairman of National Assessment and Accreditation Council (NAAC) executive council and acting UGC chairman, in his lecture at Madras University recently, encouraging colleges to reach out to the former students and seek support.

Date: 14th August 2017

Channel: ET Now

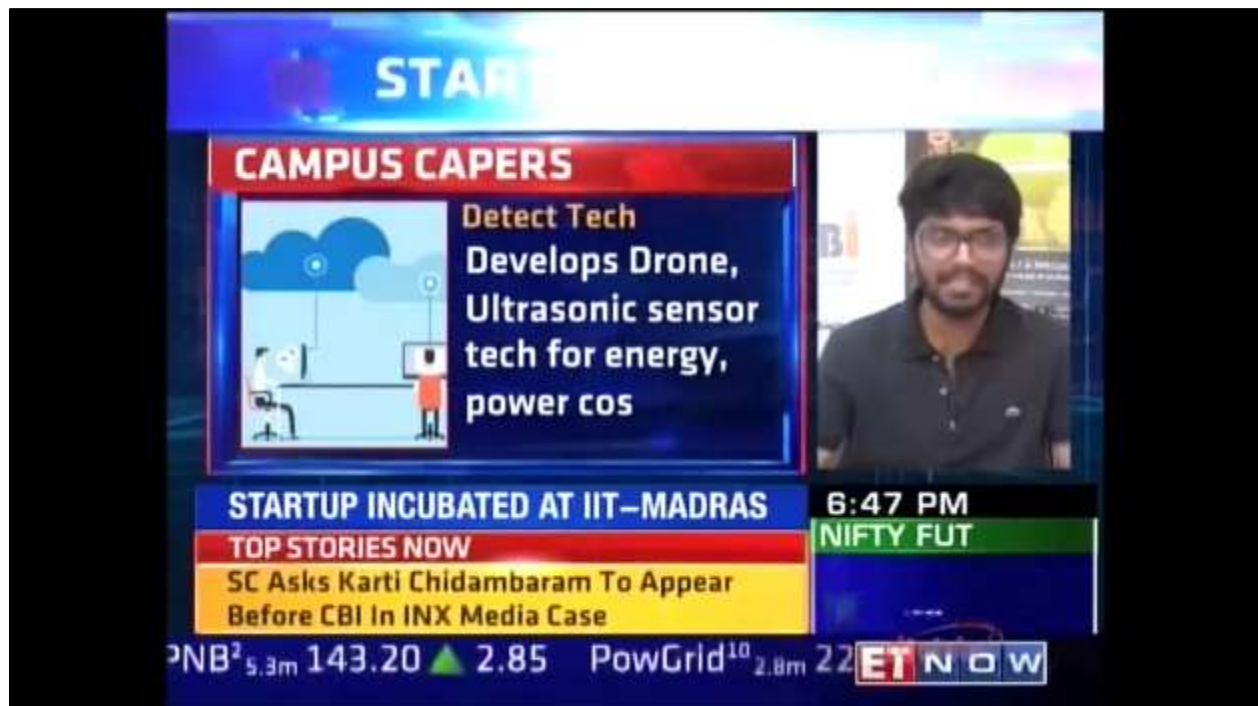
Edition: Electronic

Journalist: NA

Alumni: Daniel Raj David

**Headline: Detech Tech: Best on Campus award at ET Startup Awards 2017**

URL: <https://we.tl/4rUb0aoFuo>



Date: 17th August 2017

Publication: Inc42

Edition: Online

Journalist: Aparna Mishra

Professor: Prof. Krishnan Balasubramanian

Alumni: Daniel Raj David, Harikrishnan AS, Karthik R & Tarun Mishra

**Headline: IIT Madras Incubated IoT Startup DeTect Technologies Gets Backing From Axilor Ventures, Others**

URL: <https://inc42.com/buzz/detect-technologies-axilor-iit-madras/#.WZUP6EjHIU>

### **IIT Madras Incubated IoT Startup DeTect Technologies Gets Backing From Axilor Ventures, Others**

IIT Madras incubated, IoT Startup DeTect Technologies has raised an undisclosed amount of funding from IIM Ahmedabad's CIIE, Axilor Ventures and angel network Keiretsu Forum. The round was led by AJ Ventures and Investments of the Refex Group.

DeTect was incubated at IIT Madras' incubation cell. It was founded by IIT Madras alumni Daniel Raj David, Harikrishnan AS, Karthik R, Tarun Mishra and professor Krishnan Balasubramanian. It is an IoT startup working towards enhancing productivity in industries through Artificial Intelligence and NDE.

Commenting on the funding, CEO Daniel Raj David said, "We will use the funding on R&D and expansion to cater to international clients. We are also set to start using our products for indoor application for asset inspection."

DeTect Technologies builds tech for asset monitoring in the heavy industrial sector. The startup has built a drone Noctua, that it now claims to offer to 10 big organisations, including BPCL, HPCL and Tata, etc. Noctua is a smart drone tailored to conduct inspections of large industrial structures. This is a hallmark product that addresses several inspection problems faced by industries.

Apart from this, the startup has developed an ultrasonic sensor called GUMP (Guided Ultrasonic Monitoring of Pipe Systems). GUMP is DeTect Technologies' flagship product and caters to the energy sector for inspection of pipelines through remote monitoring.

Ashwin Raguraman, Partner at CIIE's Bharat Innovation Fund said, "DeTect's IoT product for high temperature and inaccessible pipelines and other industrial assets is at the cutting edge of technology and demonstrates how deep technology, which is globally competitive, is being built out of India. We are excited to support DeTect in its journey from having a world-class product to becoming a world-class business."

Earlier, DeTect Technologies had received backing from IIT Madras incubation cell through one of its first clients --Reliance Industries. The company has currently set its eyes on international clients.

In January 2017, DeTect Technologies received the "WIEF-SBI Startup Of The Year" award along with \$12K cash at the Fourth Wharton India Startup Competition. In February, Bengaluru-based IoT startup Flutura

Decision Sciences and Analytics raised \$7.5 Mn Series A funding, led by Vertex Ventures and supported by Lumis Partners and existing investor, The Hive.

With the recent fundraise from Axilor Ventures, CIIE Ahmedabad and Keiretsu network, DeTect will look to venture into the international market. How it will be able to establish a strong foothold among international IoT players remains to be seen.

Date: 17th August 2017

Publication: Tech Story

Edition: Online

Journalist: Chinmay Bidkar

Professor: Prof. Krishnan Balasubramanian

Alumni: Daniel Raj David, Harikrishnan AS, Karthik R & Tarun Mishra

**Headline: Chennai-based Detect Technologies Raises Funding from Multiple Investors**

URL: <http://techstory.in/detect-technologies-raises-funding-1608/>

### **Chennai-based Detect Technologies Raises Funding from Multiple Investors**

IoT tech startup DeTect Technologies has raised an undisclosed amount of funding from IIM Ahmedabad's CIIE, Axilor Ventures and angel network Keiretsu Forum. Around 15 investors on the Keiretsu network invested in the company, led by entrepreneur Anil Jain's AJ Ventures as per the report by ET.

Founded by alumni Daniel Raj David, Harikrishnan AS, Karthik R, Tarun Mishra and professor Krishnan Balasubramanian, Detect was started at IIT Madras's incubation cell. Detect is an organization, which mainly focuses on pipeline integrity and management.

"We are looking to commercialize both products at both the national and international level. Both products are already being used by several oil and gas companies. International trials are under way," said Daniel David, co-founder and CEO, Detect.

Ganapathy Venugopal, co-founder and CEO, Axilor Ventures, "While deep-tech has held tremendous potential, we have seen very few startups realize this promise. Detect is a great example of globally relevant deep-tech solutions emerging from India. We are very excited to see the rapid progress the young team of Detect has made during our accelerator program."

Date: 18th August 2017

Publication: ET Now

Edition: Electronic

Journalist: NA

Alumni: Vivek Rajkumar

**Headline: ET Startup Awards for Best Social Enterprise: Aibono**

URL: <https://www.facebook.com/aibonoworld/videos/1637301956279803/>

