Monthly Coverage Dossier
June 2017

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

Date: 6th June 2017
Publication: Hukumnama Samachar
Edition: Kota
Page no.: 9
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi
Headline: IIT Madras offers great opportunities to students in terms of job, research and academics

आईआईटी मद्रास देता है छात्रों को रोजगार, अनुसंधान, अकादमिक कार्यक्रमों के श्रेष्ठ अवसर

चेन्नैई। निरंतर दो साल से देश के शीर्ष इंजीनियरिंग कॉलेजों में स्थान प्राप्त और विश्वविद्यालय आधारित प्रथम भारतीय रिसर्च पार्क की जन्मभूमि के तौर पर, भारतीय प्रौद्योगिकी संस्थान मद्रास छात्रों के लिए रोजगार, अनुसंधान, उद्यमिता, अकादमिक तथा खेल उत्कृष्टता में बहुत से अनूठे अवसर प्रदान करता है। प्रो. भास्कर रामामूर्ति, डायरेक्टर, आईआईटी मद्रास कहते हैं कि संस्थान छात्रों अलग तरह से कुशल बना रहा है। ''यहां के छात्रों को नौकरी प्रदाता, समस्याओं का समाधान करने वाला, और संपदा सृजक बनना होगा।'' हम आईआईटी जैसे संस्थानों को नए क्षेत्रों में नौकरियां उत्पन्न करने वाले इंजन के रूप में देखते हैं। चाहे यह प्लेसमेंट, रिसर्च, अकादमिक कार्यक्रमों या खेलों की बात हो, आईआईटी मद्रास सदैव अग्रणी रहता है।भारत सरकार द्वारा भारतीय प्रौद्योगिकी संस्थान मद्रास की स्थापना 1959 में राष्ट्रीय महत्व के संस्थान के तौर पर की गई थी। प्रौद्योगिकी और विज्ञान के विभिन्न क्षेत्रों में संस्थान द्वारा की गई गतिविधियों को 16 अकादमिक विभागों तथा कई उन्नत अंतरअनुशासनिक अनुसंधान अकादमिक केंद्रों में अंजाम दिया गया है। अध्यापन तथा अनुसंधान के लिए संस्थान में 100 से ज्यादा पूर्णतया सज्जित प्रयोगशालाएं हैं। आईआईटी को दुनिया भर में इसके बौद्धिक नेतृत्व और इंजीनियरिंग तथा शुद्ध विज्ञान के हर एक प्रमुख विषय में सतत् नवोन्मेष के लिए मान्यता प्राप्त है। आईआईटी को भारत सरकार के मानव संसधान विकास मंत्रालय के राष्ट्रीय संस्थागत रैंकिंग फ्रेमवर्क वेबसाइट जारी की गई रैंकिंग में 2016 तथा 2017 के लिए इंजीनियरिंग संस्थाओं में पहला स्थान और समग्र संस्थानों की रैंकिंग के लिए 2017 में दूसरा स्थान दिया गया है।

Date: 7th June 2017
Publication: Jay Nayak
Edition: Kota
Page no.: 2
Journalist: NA
Professor:
Headline: IIT Madras is a leading Institute

IIT मद्रास सदैव अग्रणी

चेन्नै। निरंतर दो साल से देश के शीर्ष इंजीनियरिंग कॉलेजों में स्थान प्राप्त और विश्वविद्यालय अधारित प्रथम भारतीय रिसर्च पार्क की जन्मभूमि के तौर पर, भारतीय प्रौद्योगिकी संस्थान मद्रास छात्रों के लिए रोजगार, अनुसंधान, उद्यमिता, अकादमिक तथा खेल उत्कृष्टता में बहुत से अनूठे अवसर प्रदान करता है।लगभग्ग 640 एकड़ में फैले विशाल केम्पस में, चेन्नै शहर के प्रमुख छोत्रों में से एक में पेड-पौधों की लगभग 600 प्रजातियां हैं। यहां का परिवेश छात्रों के लिए अतिरिक्त आकर्षण का केंद्र है। संस्थान छात्रों अलग तरह से कुशल बना रहा है। "यहां के छात्रों को नौकरी प्रदाता, समस्याओं का समाधान करने वाला, और संपदा सृजक बनना होगा।"हम IIT जैसे संस्थानों को नए क्षेत्रों में नौकरियां उत्पन्न करने वाले इंजन के रूप में देखते हैं।

Date: 9th June 2017
Publication: Rastra Doot
Edition: Jaipur
Page no.: 5
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi
Headline: IIT Madras leads in providing placement opportunities

रोजगार अवसर प्रदान करने मे अग्रणी भारतीय प्रौद्योगिकी संस्थान मद्रास

चेन्नै। निरंतर दो साल से देश के शीर्ष इंजीनियरिंग कॉलेजों में स्थान प्राप्त और विश्वविद्यालय आधारित प्रथम भारतीय रिसर्च पार्क की जन्मभूमि के तौर पर, भारतीय प्रौद्योगिकी संस्थान मद्रास छात्रों के लिए रोजगार, अनुसंधान, उद्यमिता, अकादमिक तथा खेल उत्कृष्टता में बहुत से अनूठे अवसर प्रदान करता है। प्रो. भास्कर रामामूर्ति, डायरेक्टर, IIT मद्रास कहते हैं कि संस्थान छात्रों को अलग तरह से कुशल बना रहा है। "यहां के छात्रों को नौकरी प्रदाता, समस्याओं का समाधान करने वाला, और संपदा सृजक बनना होगा।

Date: 9th June 2017
Publication: NDTV
Edition: Online
Journalist: Shihabudeen Kunju S
Headline: NIRF 2017: Know Best Higher Education Institutions From Tamil Nadu In Overall Ranking
URL: http://www.ndtv.com/education/nirf-2017-know-best-higher-education-institutions-from-tamil-nadu-in-overall-ranking-1709717

NIRF 2017: Know Best Higher Education Institutions From Tamil Nadu In Overall Ranking

NEW DELHI: In the NIRF 2017 over all ranking, which is led by Indian Institute of Science, IITs, Jawaharlal Nehru University and Banaras Hindu University in Top 10, a good number of colleges and universities from Tamil Nadu found their place in total list of 100 educational institutions. Indian Institute of Technology, Madras was ranked second in the whole ranking while two more universities also found its place in top 20. In total, 20 educational institutions from Tamil Nadu were ranked in the top 100 institutions in overall ranking of National Institutional Ranking Framework (NIRF) 2017.

Here is the list of best educational institutions from Tamil Nadu ranked in NIRF 2017 overall performance:

IIT Madras was ranked second in NIRF 2017 overall ranking

(in the order of Institution name, Location and NIRF overall ranking)
Indian Institute of Technology Madras, Chennai, 2
Anna University, Chennai, 13
Amrita Vishwa Vidyapeetham, Coimbatore, 16
Vellore Institute of Technology, Vellore, 22
Tamil Nadu Agricultural University, Coimbatore, 28
National Institute of Technology Tiruchirappalli, Tiruchirappalli, 34
Bharath Institute of Higher Education & Research, Chennai, 35
Bharathiar University, Coimbatore, 45
Shanmugha Arts Science Technology & Research Academy (SASTRA), Thanjavur, 50
S.R.M Institute of Science and Technology, Chennai, 55
Tamil Nadu Veterinary & Animal Sciences University, Chennai, 60
Sri Ramachandra University, Chennai, 61
University of Madras, Chennai, 64
Indian Institute of Management Tiruchirappalli, Tiruchirappalli, 67
Sathyabama Institute of Science and Technology, Chennai, 72
Sri Sivasubrmaniya Nadar College of Engineering, Kalavakkam, 80
Indian Institute of Crop Processing Technology, Thanjavur, 87
PSG College of Technology, Coimbatore, 88
Saveetha Institute of Medical and Technical Sciences, Chennai, 91
Annamalai University, Annamalainagar, 92

Note: In NIRF 2017 rankings, only 2,995 institutions participated. India has 39,000 registered colleges, 11,000 stand-alone institutions and over 760 universities, which means, the country hosts around 51,000 strong higher educational institutions. Of all these, less than 3,000 participated which is just about 6% of the overall higher educational institutions in the country.

Date: 13th June 2017
Publication: The Hindu Business Line
Edition: Chennai/Delhi/Mumbai/Pune/Bangalore/Hyderabad/Kolkata/Kochi/Ahmedabad
Page no.: 15
Journalist: T.E Raja Simhan
Professor: Prof. Manu Santhanam
Headline: Intel No 1 hirer at IIT-Madras placement; top pay ₹1.15 cr
URL: http://www.thehindubusinessline.com/info-tech/intel-no-1-hirer-at-iitmadras-placement-top-pay-115-cr/article9725535.ece

Intel No 1 hirer at IIT-Madras placement; top pay ₹1.15 cr

Steep fall in number of start-ups looking for candidates

TE RAJA SIMHAN
Chennai, June 12

US technology company Intel was the top recruiter at the 2016-17 campus placement at IIT-Madras by hiring 29 students mostly with computer science domain, said Manu Santhanam, Advisor, Training and Placement, IIT-Madras.

The top salary offered this year was an annual package of $180,000 (about ₹1.15 crore), he said without divulging the company's name. There was an increase in average and median salary by about 5 per cent, he said.

Citicorp (23 students), Samsung R&D (20), Cognizant Technology Solutions (19) and Eaton (19) were the other top recruiters, he told *BusinessLine*.

The number of start-ups that came for campus placement dropped to 53 from 139 in the previous year, he said.

"After several start-ups failed to keep their promises following the offers, students and placement office were a lot more cautious in inviting start-ups this year. This may be one of the reasons for the decline in the number of start-ups coming for campus placement. Those students who could not get into start-ups were given an opportunity this year during placement," he said.

On hiring spree

Year	Students registered	Number of companies visited	Number of offers made	Number of students placed	Number of pre-placement offers	Total number of students placed
2015-16	1,033	213	803	725	69 (54 accepted)	779
2016-17 (till May 19)	1,171	220	857	764	73 (56 accepted)	820

However, the lower number of start-ups was compensated by more hardcore technology companies such as Intel and public sector undertakings (PSUs) participating in large numbers.

Some of the top IT service companies, which are bulk recruiters, did not participate for the last couple of years, he said.

This year, eight PSUs, including ISRO, Coal India, HPCL and ONGC, selected a total of 39 students as against three PSUs and 19 students last year, he said.

Some of the companies were from sectors like analytic, consulting, education, finance and information technology, he said.

Santhanam said, while a majority of graduating students are placed through campus placement, some job opportunities come up through their respective department faculty via out-of-placement offers.

Exit data

The exit data collected before 2016 convocation showed that the entire graduating class had either been placed, opted for higher studies or started their careers as entrepreneurs.

The current year's exit data will be available in August, he said.

Date: 14th June 2017
Publication: International Business Times
Edition: Online
Journalist: Vanilla Sharma
Professor: Prof. Manu Santhanam
Headline: Intel top recruiter in IIT Madras; Samsung, CTS follow; annual package of Rs 1.15 crore offered
URL: http://www.ibtimes.co.in/intel-top-recruiter-iit-madras-samsung-cts-follow-annual-package-rs-1-15-crore-offered-730541

Intel top recruiter in IIT Madras; Samsung, CTS follow; annual package of Rs 1.15 crore offered

The Indian Institute of Technology, Madras, seems to be making quite a mark this placement season. US technology firm Intel was the top recruiter in the 2016-17 season and hired 29 students from the institute. Most of them were reportedly from the computer science department.

Intel was closely followed by Citicorp, which hired 23 students, Cognizant Technology Solutions, 19, and Eaton, which also hired 19 students. One of the companies has offered an annual package of Rs 1.15 crore, the highest, Manu Santhanam, advisor, Training and Placement, IIT-Madras, told BusinessLine. However, he refused to reveal the name of the company.

While industry giants took on board quite a number of students, the charm of start-ups seems to have faded among the students as well as the institute. About 139 start-ups are said to have come for placements last year, but only 53 showed up this placement session. This could also be because the institute explained that they have been picky about the companies that they want to invite for placements.

"After several start-ups failed to keep their promises following the offers, students and placement office were a lot more cautious in inviting start-ups this year. This may be one of the reasons for the decline in the number of start-ups coming for campus placement. Those students who could not get into start-ups were given an opportunity this year during placement," Santhanam explained to the website.

Last year, the campus saw numerous start-ups such as My Ally, Belcan, Swiggy, Urban Ladder and Noodle Analytics, vying for the students' attention, but this year it was mostly IT giants that recruited students. In fact, Public Sector Undertakings (PSU) also made quite a mark as ISRO, ONGC, HPCL and Coal India are said to have recruited about 39 students this year.

Date: 15th June 2017
Publication: Desh Ki Dharti
Edition: Kota
Page no.: 3
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi
Headline: IIT Madras ahead in providing job opportunities

रोजगार अवसर प्रदान करने मे अग्रणी भारतीय प्रौद्योगिकी संस्थान मद्रास

कोटा। निरंतर दो साल से देश के शीर्ष इंजीनियरिंग कॉलेजों में स्थान प्राप्त और विश्वविद्यालय आधारित प्रथम भारतीय रिसर्च पार्क की जन्मभूमि के तौर पर, भारतीय प्रौद्योगिकी संस्थान मद्रास छात्रों के लिए रोजगार, अनुसंधान, उद्यमिता, अकादमिक तथा खेल उत्कृष्टता में बहुत से अनूठे अवसर प्रदान करता है। प्रो. भास्कर रामामूर्ति, डायरेक्टर, IIT मद्रास कहते हैं कि संस्थान छात्रों को अलग तरह से कुशल बना रहा है। ''यहां के छात्रों को नौकरी प्रदाता, समस्याओं का समाधान करने वाला, और संपदा सृजक बनना होगा।

Date: 16th June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 1
Journalist: NA
Professor: Prof. Manu Santhanam
Headline: Two fold jump in girls snaring jobs at IIT Madras placements
URL: http://timesofindia.indiatimes.com/city/chennai/two-fold-jump-in-girls-snaring-jobs-at-iit-madras-placements/articleshow/59170760.cms

2-fold jump in girls snaring jobs at IIT-M placements

TIMES NEWS NETWORK

Chennai: The second phase of placements for 2016-17 at IIT Madras has ended on a 'high', with the number of students placed jumping to 769 from 725 and the number of girls placed nearly doubled over last year's figure. The number of companies that came seeking recruits and the job offers made also increased.

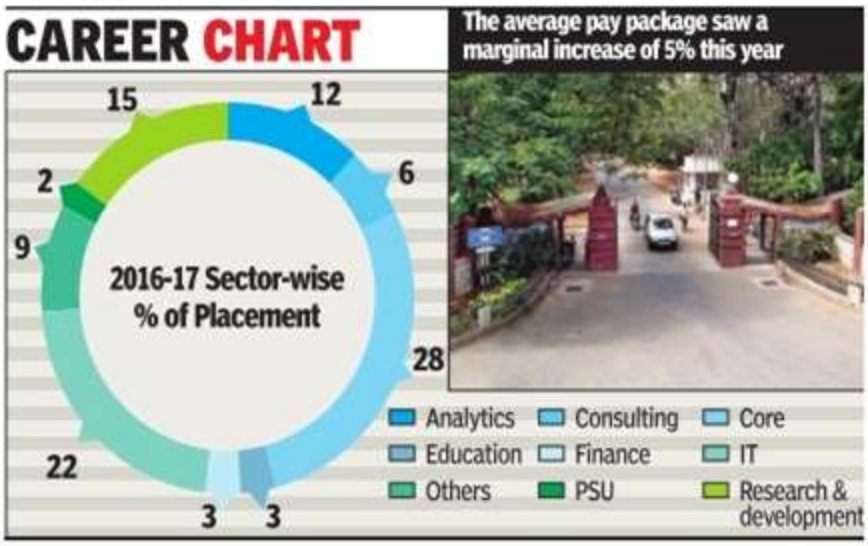
This year, 206 girl students were picked up by various companies compared to last year when only 109 girls found placements. The first phase of placements was carried out from December 1 to 13, 2016, while the second phase began in January.

Multinational technology corporation Intel was the top recruiter this season, having picked up 29 students, mostly from the computer science stream. The other top recruiters included Citicorp Services, Bengaluru-based Samsung R&D, Cognizant Technology Solutions and EATON.

The higher number of job offers made was the direct result of the increase in the number of companies participating in the process. At least 50 new companies visited the campus this year. A total of 935 job offers were made this year from 226 companies against last year's 213 firms and 872 job offers. The number of pre-placement offers too went up marginally from 69 to 73.

▶ More PSUs take part, P 4

More PSUs take part in IIT-M placements this yr



The average pay package saw a marginal increase of 5% this year

▶From P1

Officials from IIT-M said a sector-wise analysis of placements revealed that there was a drop in the number of companies from the analytics, consulting and finance sectors, but this had been offset by an increase in IT companies.

However, there was no change in the situation with regard to recruitment of students for core or research and development sectors as compared to the previous year.

INCREASE IN OFFERS FROM TECH FIRMS

In terms of packages offered to students, Professor Manu Santhanam, advisor, training and placement, IIT-Madras, said there was a marginal increase in the average (and median) salary by about 5%. However, the institute's policy does not allow it to reveal pay packages of placed students, he said.

This season there was more participation by public sector undertakings (PSUs) and central government agencies like the Navy, Oil and Natural Gas Corporation (ONGC), Indian Space Research Organisation (Isro), Coal India, Hindustan Petroleum Corporation Limited (HPCL) and Centre for Development of Telematics (C-DOT) besides Bharat Electronics Limited (BEL).

Students have the option of deferring placements by one year during which they may work on their own start-ups, apply for higher education programmes or prepare for civil services examinations.

Santhanam said the exit data collected prior to the 2016 convocation showed that members of the graduating class had either been placed, opted for higher studies or started their careers as entrepreneurs.

Some job opportunities also come through their respective department faculty via out-of-placement offers. The current year's exit data will be available in August, he added.

Date: 16th June 2017
Publication: The New Indian Express
Edition: Chennai
Page no.: 4
Journalist: NA
Professor: Prof. Prof Manu Santhanam
Headline: Marginal increase in campus recruitment
URL: http://www.newindianexpress.com/cities/chennai/2017/jun/16/marginal-increase-in-campus-recruitment-1617201.html

IIT MADRAS

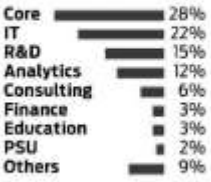
Marginal increase in campus recruitment

EXPRESS NEWS SERVICE @ Chennai

ALTHOUGH the IIT Madras placement season started on a lacklustre note due to the death of former Chief Minister J Jayalalithaa and devastation caused by Cyclone Vardah, the numbers have improved during the second phase. At the season's conclusion, the number of students placed stands at 769, higher than last year's 725. Importantly, the number of girls placed has almost doubled, going up from 109 last year to 206. In all, 226 companies made 935 job offers this year, while the figures for last year were 213 companies and 872 job offers. The total number of pre-placement offers went up marginally from 69 to 73.

Prof Manu Santhanam, advisor, training and placement, IIT Madras, said: "There was a marginal increase in the average salary by about 5%." A sector-wise analysis of placement and recruiting companies reveals there has been no shift in Core and R&D. While there has been a drop in Analytics/Consulting/Finance, this has been offset by an increase in IT companies. There was a greater participation by Public Sector Undertakings (PSUs).

Sector-wise placement



Multinational Technology firm Intel was the top recruiter during the 2016-17, hiring 29 students, mostly from the Department of Computer Science, during campus placement. Other top recruiters include Citicorp Services, Samsung R&D (Bengaluru), Cognizant Technology Solutions and EATON. Meanwhile, public sector and government agencies including Indian Navy, Oil and Natural Gas Corporation (ONGC), Indian Space Research Organisation (ISRO), Coal India, Hindustan Petroleum Corporation Limited (HPCL) and Centre for Development of Telematics (C-DOT) besides Bharat Electronics Limited (BEL) also made offers.

Santhanam said that a majority of graduating students are placed through the campus Placement Cell. However, some job opportunities also come through their respective department faculty via out-of-placement offers.

PLACEMENT IN NUMBERS

Year	Registered	Placed	Offers	Companies
2011-12	1,220	860	919	303
2012-13	1,282	825	923	241
2013-14	1,435	873	1,010	269
2014-15	1,368	899	1,019	250
2015-16	1,206	725	872	216
2016-17	1,297	769	935	226

Date: 16th June 2017
Publication: Telangana Today
Edition: Online
Journalist: NA
Professor: Prof. Prof Manu Santhanam
Headline: Campus placements for girls at IIT Madras almost double this year
URL: https://telanganatoday.com/campus-placements-iit-madras

Campus placements for girls at IIT Madras almost double this year

A total of 226 companies made 935 job offers this year, while the figures for last year were 213 companies and 872 job offers. The total number of pre-placement offers went up marginally from 69 to 73.

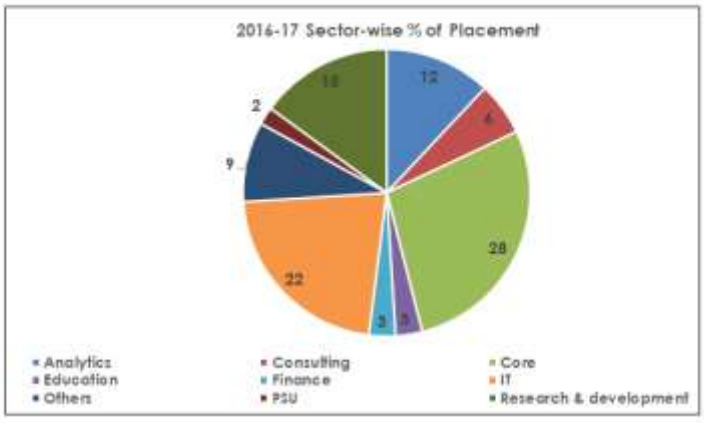
Chennai: As the placement season of 2016-17 comes to a conclusion, campus placements continue to remain strong at Indian Institute of Technology Madras this year as well. The number of students placed through the placement cell went up to 769 this academic year, as against 725 in the preceding academic year (2015-16).

The number of girl students placed has almost doubled, going up from 109 last year to 206 during 2016-17.

Further, 226 companies made 935 job offers this year, while the figures for last year were 213 companies and 872 job offers. The total number of pre-placement offers went up marginally from 69 to 73.

Speaking about the placements in 2016-17, IIT-Madras placement advisor Prof Manu Santhanam said, “There was a marginal increase in the average (and median) salary by about five per cent.”

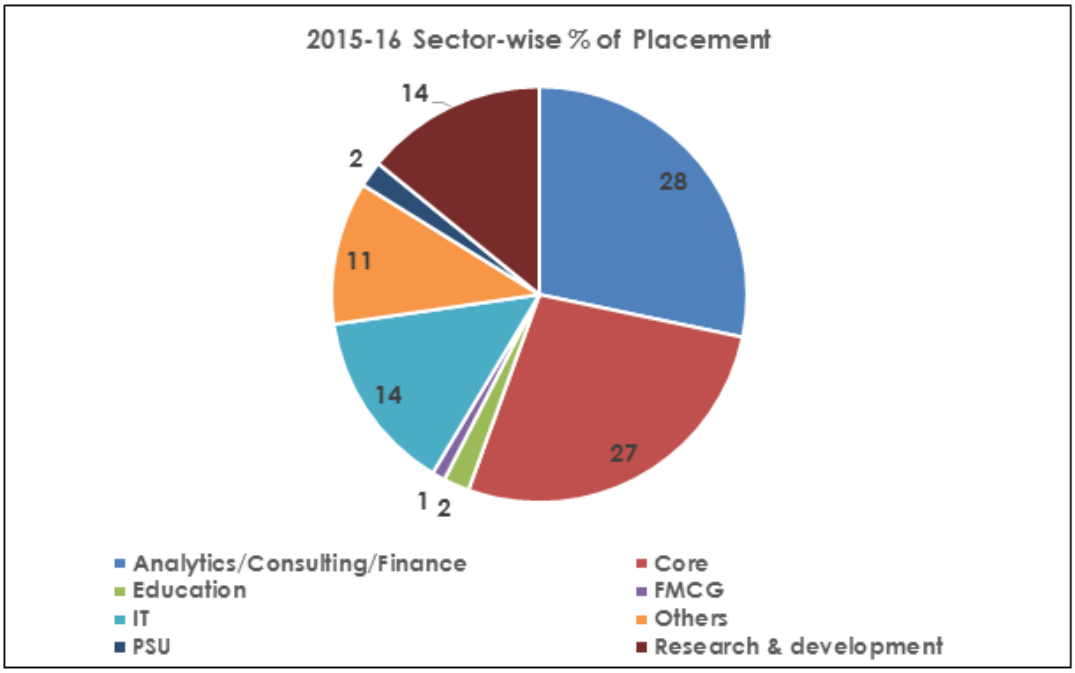
Sector-wise placement data for 2016-17:



IIT-Madras also offers students the option of deferring placements by one year. The major reasons for students opting to defer placements include working on their own start-ups, applying for higher education or preparing for civil services examinations.

A sector-wise analysis of the placement and recruiting companies reveals that there has been no shift in Core and Research & Development sectors as compared to the preceding previous year. While there has been a drop in Analytics/Consulting/Finance sectors, this has been offset by increase in IT companies. There was also a greater participation by Public Sector Undertakings (PSU).

Sector-wise placement data for 2015-16:



Multinational tech firm Intel was the top recruiter during 2016-17, hiring 29 students, mostly from computer science. Other top recruiters include Citicorp Services, Samsung RnD, Bangalore, Cognizant Technology Solutions and EATON.

PSUs and government agencies that visited this year during placements include the Indian Navy, Oil and Natural Gas Corporation (ONGC), Indian Space Research Organisation (ISRO), Coal India, Hindustan Petroleum Corporation Limited (HPCL), Centre for Development of Telematics (C-DOT) and Bharat Electronics Limited (BEL).

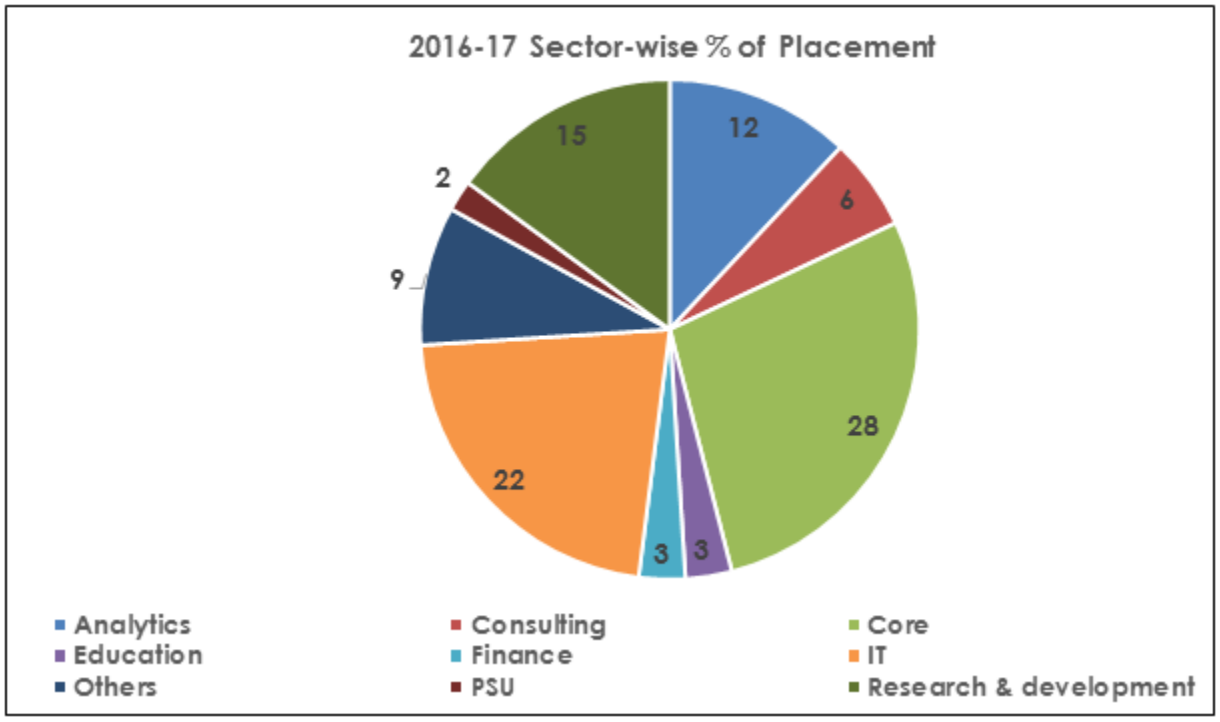
The placement season of 2016-17 also saw more than 50 new companies taking part.

Prof Santhanam said that a majority of graduating students are placed through campus placement cell. However, some job opportunities also come through their respective department faculty via out-of-placement offers.

The exit data collected before 2016 convocation showed that the entire graduating class had either been placed, opted for higher studies or started their careers as entrepreneurs. The current year's exit data will be available in August, he added.

Date: 18th June 2017
Publication: India Education Diary
Edition: Online
Journalist: NA
Professor: Prof. Manu Santhanam
Headline: Placements Continue to Remain Strong at IIT-Madras
URL: http://indiaeducationdiary.in/placements-continue-remain-strong-iit-madras/

Placements Continue to Remain Strong at IIT-Madras



Chennai: As the placement season of 2016-17 comes to a conclusion, placements continue to remain strong at Indian Institute of Technology Madras this year. The no. of students placed through the Placement Cell went up to 769 this compared to 725 in the preceding academic year of 2015-16. The number of girl students placed has almost doubled, going up from 109 last year to 206 during 2016-17.

Further, 226 companies made 935 job offers this year, while the figures for last year were 213 companies and 872 job offers. The total number of pre-placement offers went up marginally from 69 to 73.

Speaking about the placements in 2016-17, Prof. Manu Santhanam, Advisor, Training and Placement, IIT-Madras, said, “There was a marginal increase in the average (and median) salary by about 5%.”

IIT-Madras also offers students the option of deferring placements by one year. The main reasons for students opting to defer include working on their own start-ups, applying for higher education or preparing for civil services examinations.

A sector-wise analysis of the placement and recruiting companies reveals that there has been no shift in Core and Research & Development as compared to the preceding year. While there has been a drop in Analytics/Consulting/Finance, this has been offset by increase in IT companies. There was also a greater participation by Public Sector Undertakings (PSUs).

Multinational Technology firm Intel was the top recruiter during the 2016-17, hiring 29 students, mostly from Computer Science Department, during the campus placement. Other top recruiters include Citicorp Services, Samsung RnD, Bangalore, Cognizant Technology Solutions and EATON.

The PSU and Government agencies that visited this year during placements include the Indian Navy, Oil and Natural Gas Corporation (ONGC), Indian Space Research Organisation (ISRO), Coal India, Hindustan Petroleum Corporation Limited (HPCL) and Centre for Development of Telematics (C-DOT) besides Bharat Electronics Limited (BEL). The placement season of 2016-17 also saw more than 50 new companies taking part.

Prof. Santhanam said that a majority of graduating students are placed through the campus Placement Cell. However, some job opportunities also come through their respective department faculty via out-of-placement offers.

The exit data collected before 2016 convocation showed that the entire graduating class had either been placed, opted for higher studies or started their careers as entrepreneurs. The current year's exit data will be available in August, he added.

Date: 18th June 2017
Publication: The Hindu
Edition: Chennai
Page no.: 4
Journalist: NA
Professor: Prof. Manu Santhanam
Headline: 206 women IIT-M students land jobs
URL: http://www.thehindu.com/todays-paper/tp-national/tp-tamilnadu/206-women-iit-m-students-land-jobs/article19097335.ece

206 women IIT-M students land jobs

SPECIAL CORRESPONDENT
CHENNAI

As many as 206 women were placed in various organisations this season at the Indian Institute of Technology - Madras. Last year, only 109 women students were placed.

The placement season for 2016-17 saw better results with 44 more students getting job offers, said officials. This year, 769 candidates were placed, whereas last year 725 students had been placed. A total of 226 companies made 935 job offers this year.

Last year, 213 companies had made 872 job offers and the total number of pre-placement offers was more this year, with 73 candidates receiving such offers. Last year, only 69 candidates received offers.

There was a marginal increase of about 5% in the average and median salary, said Manu Santhanam, advisor, training and placement.

This year, public sector undertakings such as ONGC, ISRO, Coal India, HPCL, C-DOT and Bharat Electronics Limited participated in the recruitment programme. Fifty new companies also participated in the placement programme.

Though there was no change in jobs offers in core industry and research and development, a dip was noticed in offers in analytics/consulting/finance sectors. Prof. Santhanam said the drop had been offset by offers from IT companies.

Technology firm Intel recruited as many as 29 students, mostly from the computer science department. Other major recruiters included Citicorp Services, Samsung RnD, Bengaluru, Cognizant Technology Solutions and EATON.

Date: 19th June 2017
Publication: DT Next
Edition: Chennai
page no.: 4
Journalist: NA
Professor: Prof Santhanam
Headline: A strong placement drive at IIT-Madras
URL: http://www.dtnext.in/News/City/2017/06/19084938/1036565/A-strong-placement-drive-at-IITMadras.vpf

A strong placement drive

CHENNAI: According to IIT Madras, more students have been placed this year, with the number of girls almost doubling (109 to 206) compared to last year.

Intel was the top recruiter and the company hired 29 students, mostly from the Computer Science Department. Citicorp Services, Samsung RnD, Bengaluru, Cognizant Technology Solutions and EATON were the other recruiters.

Fifty companies participated and even PSUs and Government agencies such as Indian Navy, Oil and Natural Gas Corporation (ONGC), Indian Space Research Organisation (ISRO), Coal India, Hindustan Petroleum Corporation Limited (HPCL) and Centre for Development of Telematics (C-DOT) and Bharat Electronics Limited (BEL) visited the campus.

Prof. Manu Santhanam, Advisor, Training and Placement, IIT-Madras, said, "There was a marginal increase in the average (and median) salary." He said, "Prof Santhanam had pointed out that a majority of graduating students are placed through the campus Placement Cell. However, some job opportunities also come through their respective department faculty via out-of-placement offers."

Students at IIT-Madras also have an option of deferring placements by one year for pursuing their start-up dreams, applying for higher education or preparing for civil services exams.

A press report from the institution says that the sector-wise analysis of the placement and recruiting companies reveals that there has been no shift in core and Research and Development as compared to the preceding year. While there has been a drop in Analytics/Consulting/Finance, this has been offset by increase in IT companies.

Date: 20th June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 1
Journalist: Vinayashree J
Professor: Prof. Bhaskar Ramamurthi & Prof. V Jagadeesh Kumar
Headline: IIT-M interdisciplinary degrees to multi-skill grads
URL: http://timesofindia.indiatimes.com/city/chennai/iit-madras-to-offer-interdisciplinary-dual-degree-programme/articleshow/59218814.cms

IIT-M interdisciplinary degrees to multi-skill grads

TIMES NEWS NETWORK

Chennai: Academia is increasingly embracing the concept of interdisciplinary study, with industry looking to hire students with multiple skill sets and subject backgrounds, and IIT-Madras has now hopped on the bandwagon.

IIT-M will, from the coming 2017 academic session, provide an option for students of BTech as well as those pursuing dual degrees (DD — combined BTech and M Tech) to upgrade to interdisciplinary dual degree (ID DD) programmes — courses that prepare students to perform on the cutting edge of technology.

The ID DD programme will involve a study period of five years, during which a student can obtain a BTech degree in a parent discipline and an MTech in an interdisciplinary field.

Undergraduate or DD students from any branch of engineering can opt for interdisciplinary dual degree programmes after completing the second year of BTech. They will, however, have to meet certain academic criteria. The option to upgrade will be available only to students with a CGPA greater than 8 at the beginning of the 5th semester of their course.

IIT-M director Bhaskar Ramamurthi said the upgrade option is a part of the institute's endeavour to offer more flexibility.

"IIT-Madras will be allowing its undergraduate and DD students to gain dual degrees in four highly sought-after domains: advanced materials & nano technology, biomedical engineering, computational engineering, and data science," he said.

The institute may gradually expand the programme to include fields such as energy systems, battery technology, the Internet of Things, Industry 4.0 and management.

IIT-M dean, academic courses, V Jagadeesh Kumar said the institute chose the four domains that it is starting with because they are currently subjects of widespread and intensive research.

▶ New domains, P 4

'No specific deadline set for introducing entrance and exit test in engg colleges'

The Centre's plan to conduct a common entrance and exit test for engineering and technical courses has been put off following opposition from a few states like Tamil Nadu and West Bengal, Anil Sahasrubudhe, chairman of the All India Council of Technical Education, said on Monday. Sahasrubudhe said unlike in the case of NEET, the Centre was determined to get all states on board before introducing the system. So it has not set a specific deadline for introduction of the entrance and exit test for engineering that was mooted last December to deal with the skewed standards of engineering education in the country. P 5

'Research has opened up new domains'

▶From P 1

Chennai: "Due to a lot of research, there is scope for application and growth [in these domains]," he said. "These are upcoming fields and many discoveries are taking place so the opportunities for students are high."

Kumar said fast-paced developments in these areas made it essential to have proficient human resources that can match the growth.

"It is imperative that students of IIT Madras are given opportunities to learn and work in areas that will define the future of engineering and technology in the world," he said.

While the institute already offers dual degree programmes, these are tailor-made options such as (BTech, civil + MTech, environmental engineering) to suit the industry.

EMPOWERING STUDENTS

The ID DD courses that are being introduced, however, are more programme-specific and will have a variety of options.

IIT Madras officials said the initiative will enable students to earn added qualifications in areas of their choice and will also be useful to those who may not have been able to secure a preferred discipline during admission.

Date: 20th June 2017
Publication: The Hindu
Edition: Chennai
Page no.: 6
Journalist: NA
Professor: Prof. Prof. Bhaskar Ramamurthi
Headline: Interdisciplinary dual degree on offer at IIT-M
URL: http://www.thehindu.com/news/national/tamil-nadu/interdisciplinary-dual-degree-on-offer-at-iit-m/article19105763.ece

Interdisciplinary dual degree on offer at IIT-M

Students from any engineering branch can apply

SPECIAL CORRESPONDENT
CHENNAI

Students who join the Indian Institute of Technology-Madras (IIT-M) this academic year will have the opportunity to upgrade their dual degree programme to an interdisciplinary one.

This is in addition to the existing dual degree programme.

Flexible options

Students who join the B. Tech + M. Tech dual degree programme in the institute and opt for the Interdisciplinary Dual Degree programme (ID DD) will study for five years and receive a degree in B Tech from the parent discipline and M Tech in an interdisciplinary programme.

However, the upgrade option is limited to students with a CGPA of more than 8 in the beginning of the fifth semester.

IIT-M director Bhaskar Ramamurthi said it was part of the endeavour to offer more flexibility in education.

"The IIT-M will be allowing its UG and DD students to gain dual degree in four of the highly sought domains in the present times, including advanced materials and nanotechnology, biomedical engineering, computational engineering and data science," he said.

Later, the programme may be expanded to include areas such as energy systems, battery technology, internet of things, industry 4.0 and management.

Students of UG or DD from any branch of engineering can upgrade to any interdisciplinary dual degree programme if they meet certain academic criteria, he added.

Date: 20th June 2017
Publication: The Hans India
Edition: Hyderabad
Page no.: 14
Journalist: NA
Professor: Prof. Prof. Bhaskar Ramamurthi & Prof. V. Jagadeesh Kumar
Headline: IIT-M to offer dual degree
URL: http://www.thehansindia.com/posts/index/Young-Hans/2017-06-19/Indian-Institute-of-Technology-Madras-to-offer-dual-degree/307436

IIT-M to offer dual degree

OUR BUREAU

Hyderabad: A good news for all those dual degree aspirers 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.

These 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. This is in addition to the B.Tech + M.Tech (Dual Degree programme), the Institute already offers in several conventional disciplines.

Prof. Bhaskar Ramamurthi, Director

of IIT Madras says, "As a part of its endeavour 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." Gradually it may expand to include more areas such as energy systems, battery technology, Internet of Things, Industry 4.0 and management. UG or DD students from any branch of engineering can upgrade to the Interdisciplinary Dual Degree programme, provided they meet certain academic criteria.

Elaborating on the initiative, Prof. V. Jagadeesh Kumar, Dean of Academic Courses, IIT Madras said, "It is imperative that students of IIT Madras are given opportunities to learn and work in current areas that would define the future of engineering and technology in the world". IIT Madras regularly updates its academic courses and offers good amount of flexibility.

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. For instance, a student pursuing B.Tech in Metallurgy may probably be able to pursue B.Tech - M.Tech (ID DD) in Data Sciences by opting for this scheme.

Date: 20th June 2017
Publication: The New Indian Express
Edition: Chennai
Page no.: 2
Journalist: NA
Headline: IIT Madras allows BTech students to upgrade

IIT Madras allows BTech students to upgrade

IIT Madras will now offer an opportunity for BTech and dual degree students to upgrade to an interdisciplinary dual degree (ID DD) program. As per a press release issued by the institution, these students will study for five years and obtain BTech in the parent discipline and MTech in any interdisciplinary area. **ENS**

Date: 20th June 2017
Publication: Tamil Samayam
Edition: Online
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi
Headline: IIT-Madras to offer interdisciplinary dual degree programme
URL: http://tamil.samayam.com/education-news/iit-madras-to-offer-interdisciplinary-dual-degree-programme/articleshow/59227308.cms

பி.டெக். படித்தால், ஒரே நேரத்தில் இரட்டைப் பட்டம்: சென்னை ஐஐடி அறிவிப்பு

பி.டெக். இளநிலை பட்ட மாணவர்களும் இரண்டு பட்டங்களை ஒரே நேரத்தில் பெறும் வகையில் புதிய திட்டத்தை சென்னை ஐஐடி அறிமுகம் செய்துள்ளது.

சென்னை ஐஐடியில் 5 ஆண்டுகள் கொண்ட பி.டெக். மற்றும் எம்.டெக். இரட்டைப் பட்டம் ஏற்கெனவே வழங்கப்பட்டு வருகிறது. ஆனால் இந்த இரட்டைப் பட்டப்படிப்பு இளநிலை மற்றும் முதுநிலை பட்டம் இரண்டிலும் ஒரே துறை சார்ந்த படிப்பாகவே இருக்கிறது.

இந்நிலையில் பி.டெக். இளநிலை படிப்புடன் தொடர்புடைய வேறு துறை சார்ந்த எம்.டெக். படிப்பை தேர்வுசெய்து படிக்கும் வசதியுடன் 5 ஆண்டுகள் ஒருங்கிணைந்த பி.டெக். மற்றும் எம்.டெக். இரட்டைப் பட்டப்படிப்பு திட்டத்தை சென்னை ஐஐடி நடப்பு ஆண்டு முதல் அறிமுகம் செய்கிறது.

ஏற்கெனவே இரட்டைப் பட்டப்படிப்பில் சேர்ந்த மாணவர்கள் மட்டுமல்லாமல், 4 ஆண்டுகள் பி.டெக். படிப்புகளில் சேர்ந்த மாணவர்களும் இதில் இணைய முடியும். ஆனால், அவர்கள் ஐந்தாவது பருவத்தின் தொடக்கத்தில் ஒட்டுமொத்த மதிப்பெண் சராசரி (சி.ஜி.பி.ஏ.) 8 புள்ளிகள் பெற்றிருக்க வேண்டும்.

Date: 20th June 2017
Publication: After Graduation
Edition: Online
Journalist: NA
Professor: Prof Santhanam
Headline: IIT Madras Placements 2016-17, Record Jump In Girls Catching Job
URL: http://www.aftergraduation.co.in/iit-madras-placements-2016-17-record-jump-in-girls-recruitment-catching-job-iitm/

IIT Madras Placements 2016-17, Record Jump In Girls Catching Job

This year prove to be a good year for the IITs. Earlier in the QS World University Rankings 2018, IIT Delhi and IIT Bombay along with IISc ranked among world's top 200 universities and now a record two fold jump in girls snaring jobs at IIT Madras placements 2016-17, almost double as many as last year.

The first phase of IIT Madras placement, started on December 1,2016 has 56 per cent of its registered students placed in 176 companies. There were total 14 sessions interviews in the first phase, in which 672 out of 1195 registered students were placed. Along with the 57 students who have accepted pre-placement offers, the total number of students placed in first session are around 729.

The second session of IIT Madras placements for 2016-17 has ended on a 'high', with the number of students placed jumping to 769 and the number of girls found job placements nearly doubled over last year's figure. Around 206 IIT Madras girl students have found job placements in 2016-17 placements compared to last year when only 109 girls found placements by various companies.

The first phase of placements was carried out from December 1 to 13, 2016, while the second phase began in January, ending in the placement of 769 students in all. The overall placement figure has marginally improved too, compared to the 725 students hired in 2016.

Multinational technology corporation Intel was the top recruiter this season, having picked up 29 students, mostly from the computer science stream. The other top recruiters included Citicorp Services, Samsung R&D centre Bangalore, E & Y, EXL Services, AXIS Bank, Cognizant Technology Solutions and EATON.

The improvement in the number of Job offers in this season 2016-17 is the direct result of the increase in the number of companies visited IIT-Madras to look for job aspirants and participated in the recruitment process.

This year, some 226 companies participated in the placement process and offered a total of 935 jobs, as compared to 2015- 2016, when 213 firms made 872 job offers. The number of pre-placement offers too went up marginally from 69 to 73.

Analysis of IIT Madras Placements

Data revealed from IIT Madras Placements official statics that around 75.15 per cent of B.Tech students, 73.75 per cent of dual degree and 61.44 per cent from post graduate degree (M.Tech) students along with other degree students recruited for this placements 2016-17.

After sector-wise analysis of placements, officials from IITM revealed that there was a drop in the number of companies from the financial, consulting and analytics sectors, but the deficit has been made up by the growing participation of IT companies. In terms of packages offered to students, there was a marginal increase in the average (and median) salary by about 5%. However, the institute's policy does not allow it to reveal pay packages of placed students.

ALSO READ: IITs Tweaking Seats Based On Popularity And Employability Of Course

However, there was no major change with regard to recruitment of students for core or research and development sectors as compared to the previous year.

This season there was more participation by public sector under takings (PSUs) and central government agencies like the Navy, Oil and Natural Gas Corporation (ONGC), Indian Space Research Organisation (ISRO), Coal India, Hindustan Petroleum Corporation Limited (HPCL) and Centre for Development of Telematics (C-DOT) besides Bharat Electronics Limited (BEL).

While most students find jobs through the university's placement cell, some job opportunities also come through their respective department faculty via out-of-placement offers. Some Students also choose to defer the placements by one year during which they may work on their own start-ups and start their career as entrepreneur, apply for higher studies and other programs or prepare for UPSC's Civil Services and Engineering Services Examinations.

Officials from IITM also added that the current year's complete exit data will be available in August, 2017

Date: 20th June 2017
Publication: Dinamani
Edition: Chennai
Page no.: 4
Journalist: NA
Headline: B.Tech. students get opportunity to get Dual Degree

பி.டெக். மாணவர்களும் இரட்டை பட்டம் பெறும் வாய்ப்பு

சென்னை ஐஐடியில் அறிமுகம்

சென்னை, ஜூன் 19: பி.டெக். இளநிலை பட்ட மாணவர்களும் இரட்டைப் பட்டம் பெறும் வகையில் புதிய திட்டத்தை சென்னை ஐஐடி அறிமுகம் செய்துள்ளது. நடப்புக் கல்வியாண்டு முதல் இந்தத் திட்டம் நடைமுறைப்படுத்தப்பட உள்ளது.

இதுகுறித்து சென்னை ஐஐடி வெளியிட்ட செய்தி: சென்னை ஐஐடி-இல் ஏற்கெனவே 5 ஆண்டுகள் கொண்ட பி.டெக்., எம்.டெக்., இரட்டைப் பட்டம் வழங்கப்பட்டு வருகிறது. ஆனால், இந்த இரட்டைப் பட்டப் படிப்பு இளநிலை, முதுநிலை பட்டம் இரண்டிலும் ஒரே துறை சார்ந்த படிப்பாக வழங்கப்பட்டு வருகிறது.

இந்நிலையில், பி.டெக். இளநிலை படிப்புடன் தொடர்புடைய வேறு துறை சார்ந்த எம்.டெக். படிப்பை மேற்கொள்ளும் வகையில் 5 ஆண்டுகள் ஒருங்கிணைந்த பி.டெக்., எம்.டெக். படிப்புத் திட்டத்தை சென்னை ஐஐடி இப்போது அறிமுகம் செய்துள்ளது.

ஏற்கெனவே இரட்டைப் பட்டப் படிப்பில் சேர்ந்துள்ள மாணவர்கள் மட்டுமின்றி, 4 ஆண்டுகள் பி.டெக். படிப்புகளில் சேர்ந்த மாணவர்களும் சேர முடியும். ஆனால், இந்தத் திட்டத்தில் சேர விரும்பும் மாணவர்கள் 5-ஆவது பருவத் தொடக்கத்தில் ஒட்டுமொத்த மதிப்பெண் சராசரி (சி.ஜி.பி.ஏ.) 8 புள்ளிகள் பெற்றிருப்பது அவசியம் எனத் தெரிவிக்கப்பட்டுள்ளது.

Date: 20th June 2017
Publication: Careers 360
Edition: Online
Journalist: Harshita Das
Professor: Prof. Bhaskar Ramamurthi & Prof. V Jagadeesh Kumar
Headline: IIT Madras offers option to upgrade to Interdisciplinary Dual Degree course
URL: http://www.engineering.careers360.com/news/iit-madras-offers-option-upgrade-interdisciplinary-dual-degree-course-306749

IIT Madras offers option to upgrade to Interdisciplinary Dual Degree course

From the academic session 2017-18, students pursuing B. Tech and Dual Degree (B.Tech + M.Tech) at Indian Institute of Technology (IIT), Madras will have an option to upgrade to an Interdisciplinary Dual Degree (ID DD) programme. The five year ID DD course will offer students a B.Tech in parent discipline and M.Tech. in an interdisciplinary area. The upgrade option is available to those UG and DD students who score CGPA of more than eight at the beginning of the 5th semester. This is in addition to the B.Tech + M.Tech (Dual Degree programme), the institute already offers in several conventional disciplines.

Prof. Bhaskar Ramamurthi, Director of IIT Madras said, "As a part of its endeavour 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."

Gradually, it may expand to include more areas such as energy systems, battery technology, Internet of Things, Industry 4.0 and management. UG or DD students from any branch of engineering can upgrade to the Interdisciplinary Dual Degree programme, provided they meet certain academic criteria.

Elaborating on the initiative, Prof. V. Jagadeesh Kumar, Dean of Academic Courses, IIT Madras said, "It is imperative that students of IIT Madras are given opportunities to learn and work in current areas that would define the future of engineering and technology in the world". IIT Madras regularly updates its academic courses and offers good amount of flexibility.

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. For instance, a student pursuing B.Tech in Metallurgy may probably be able to pursue B.Tech - M.Tech (ID DD) in Data Sciences by opting for this scheme.

Date: 20th June 2017
Publication: The Times of India
Edition: Online
Journalist: Hemali Chhapia
Professor: Prof. Andrew Thangaraj
Headline: NPTEL offers 116 new certification courses this session
URL: http://timesofindia.indiatimes.com/home/education/news/nptel-offers-116-new-certification-courses-this-session/articleshow/59235237.cms

NPTEL offers 116 new certification courses this session

MUMBAI: The National Programme on Technology Enhanced Learning (NPTEL) will offer 159 courses for its July to November, 2017 session.

All these courses are open for online enrollment (https://onlinecourses.nptel.ac.in)

Among these 159 courses, 43 are old and 116 courses are new.

NPTEL was initiated by seven IITs (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003.

Prof Andrew Thangaraj, NPTEL coordinator at IIT Madras said, "It is a great opportunity for learners across the country to access the IIT and IISc systems as well as experts from other reputed institutions. This enables learning without boundaries. You learn what you are interested in, and get a certificate confirming your abilities in that area."

The courses will begin from July 24, 2017 or August 21, 2017 with examination dates being on September 24/October 22, 2017 (Sundays).

All courses are free. The certification examination is optional and comes at a fee of Rs 1000/course examination.

Date: 21st June 2017
Publication: BL on Campus
Edition: Online
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi & Prof. V. Jagadeesh Kumar
Headline: Upgrade your undergraduate degree!
URL: http://www.bloncampus.com/news-wrap/upgrade-your-undergraduate-degree/article9730598.ece

Upgrade your undergraduate degree!

Students with a 8.0 or higher CGPA have this option now, at IIT-Madras

With effect from the upcoming 2017 academic session, B.Tech. and Dual Degree (B.Tech + M.Tech) (DD) students of the Indian Institute of Technology Madras (IIT Madras) will have the option to upgrade to an interdisciplinary dual degree (ID DD), programme, which they will be studying for five years. The B.Tech will be in the parent discipline and M. Tech. in the interdisciplinary area. The option is available to UG and DD students who have an 8.0 or higher CGPA at the beginning of the fifth semester. This is in addition to the dual degree programmethatthe Institute already offers in several disciplines.

Elaborating on the initiative, Prof. V. Jagadeesh Kumar, Dean of Academic Courses, IIT Madras said, “It is imperative that students of IIT Madras are given opportunities to learn and work in current areas that would define the future of engineering and technology in the world”.

Prof. Bhaskar Ramamurthi, Director of IIT Madras says, “As a part of its endeavour 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.” He added that it could gradually expand to include other areas such as energy systems, battery technology, Internet of Things, Industry 4.0 and management.

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. For instance, a student pursuing B.Tech in Metallurgy may probably be able to pursue B.Tech - M.Tech (ID DD) in Data Sciences by opting for this scheme.

Date: 21st June 2017
Publication: India Education Diary
Edition: Online
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi & Prof. V. Jagadeesh Kumar
Headline: IIT Madras now offers an opportunity to its undergraduate and dual degree students to upgrade to Interdisciplinary Dual Degree (ID DD) programme
URL: http://indiaeducationdiary.in/iit-madras-now-offers-opportunity-undergraduate-dual-degree-students-upgrade-interdisciplinary-dual-degree-id-dd-programme/

IIT Madras now offers an opportunity to its undergraduate and dual degree students to upgrade to Interdisciplinary Dual Degree (ID DD) programme

Chennai: 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. These 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. This is in addition to the B.Tech + M.Tech (Dual Degree programme), the Institute already offers in several conventional disciplines.

Prof. Bhaskar Ramamurthi, Director of IIT Madras says, “As a part of its endeavour 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.” Gradually it may expand to include more areas such as energy systems, battery technology, Internet of Things, Industry 4.0 and management. UG or DD students from any branch of engineering can upgrade to the Interdisciplinary Dual Degree programme, provided they meet certain academic criteria.

Elaborating on the initiative, Prof. V. Jagadeesh Kumar, Dean of Academic Courses, IIT Madras said, “It is imperative that students of IIT Madras are given opportunities to learn and work in current areas that would define the future of engineering and technology in the world”. IIT Madras regularly updates its academic courses and offers good amount of flexibility.

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. For instance, a student pursuing B.Tech in Metallurgy may probably be able to pursue B.Tech – M.Tech (ID DD) in Data Sciences by opting for this scheme.

Date: 21st June 2017
Publication: India Education Diary
Edition: Online
Journalist: NA
Professor: Prof. Andrew Thangaraj
Headline: NPTEL offers 159 courses for July-November 2017 session; enrolment currently open on the portal
URL: https://indiaeducationdiary.in/nptel-offers-159-courses-july-november-2017-session-enrolment-currently-open-portal/

NPTEL offers 159 courses for July-November 2017 session; enrolment currently open on the portal

Chennai: The National Programme on Technology Enhanced Learning (NPTEL) was initiated by seven Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. The online courses offered by NPTEL, unlike other popular MOOCs portals, include courses from all disciplines of Engineering such as Biotechnology, Ocean Engineering, Metallurgical Sciences etc apart from the popular ones such as Computer Science Engineering or Electrical Engineering.

For July-November 2017 session, 159 courses are open for enrolment currently on the portal (https://onlinecourses.nptel.ac.in). Among the 159, 43 are rerun of courses offered previously and 116 courses are new. The courses are offered by experts in their fields. For instance, the course "Patent Law for engineers and scientists" is offered by the Department of Industrial Policy and Promotion (DIPP) Chair Professor on Intellectual Property Rights (IPR), who is also a practising Madras High court lawyer. The course on "Programming in Python" and course on Algorithms is by Professor at CMI who is also the President of ACM, India, the leading professional body for all computer scientists.

Prof. Andrew Thangaraj, NPTEL coordinator at IIT Madras says, "It is a great opportunity for learners across the country to access the IIT and IISc systems as well as experts from other reputed institutions. This enables learning without boundaries. You learn what you are interested in, and get a certificate confirming your abilities in that area".

Some statistics regarding the open online courses since March 2014 till June 2017
Completed courses: 355
Enrolments across courses: 15,50,000+
Number of examination registrations: 1,00,000+
All the statistics pertaining to completed courses are available at nptel.ac.in/noc
All courses are completely free to enrol and learn from. The certification examination is optional and comes at a fee of Rs 1000/course examination

The content in every course is in-depth and as taught in the IITs, which will provide any candidate who goes through it, a solid foundation and understanding of a topic. Some courses such as- Networks and Systems, Fluid dynamics and turbomachines, Strength of materials, etc will help candidates prepare for the entrance examination for higher technical education as well. The bouquet also has courses on current

and cutting-edge technology, which will improve the employability of candidates in the technical domain too such as Internet of Things, Cloud Computing, Data Analytics and Machine Learning, MIMO/OFDM Cellular and Sensor Networks, etc.

The objective of these courses is to make students employable in the industry or pursue a suitable higher education programme. Through an online portal, 4-, 8-, or 12-week online courses, typically on topics relevant to students in all years of higher education along with basic core courses in sciences and humanities with exposure to relevant tools and technologies, are being offered. The enrolment to and learning from these courses involves no cost. Following these online courses, an in-person, proctored certification examination will be conducted and a certificate is provided through the participating institutions.

The courses will begin on July 24, 2017 or August 21, 2017 with examination dates being September 24/October 22, 2017 (Sundays). Last day for enrolment to the courses will be the start date of the course.

Date: 21st June 2017
Publication: NDTV
Edition: Online
Journalist: Shihabudeen Kunju S
Headline: TNEA 2017 Counselling: Know The Best NIRF Ranked Engineering Colleges In Tamil Nadu
URL: http://www.ndtv.com/education/tnea-2017-counselling-know-the-best-nirf-ranked-engineering-colleges-in-tamil-nadu-1714828

TNEA 2017 Counselling: Know The Best NIRF Ranked Engineering Colleges In Tamil Nadu

NEW DELHI: TNEA counselling 2017 rank lists will be published on June 22. National Institutional Ranking Framework (NIRF) 2017 has ranked best colleges in engineering field and more than 10 colleges and universities taking part in Tamil Nadu Engineering Admissions (TNEA) 2017 have secured their place in NIRF ranking 2017. In the NIRF Ranking 2017 in which Indian Institute of Technology (IIT) Madras was placed on the first place, Anna University which is the organisor of the TNEA was placed on eight rank.

Apart from IIT Madras and Anna University, IIT Bombay, IIT Kharagpur, IIT Delhi, IIT Kanpur, IIT Roorkee, IIT Guwahati, Jadavpur University and IIT Hyderabad found their place in top 10 of NIRF 2017's engineering ranking.

Following colleges and universities found their place in NIRF ranking's best engineering institutions in Tamil Nadu:

(In the order of Name and NIRF Rank)

Anna University 8
Sri Sivasubramaniya Nadar College of Engineering 27
P.S.G. College of Technology (Autonomous) 33
Thiagarajar College of Engineering (Autonomous) 37
Coimbatore Institute of Technology (Autonomous) 51
Kongu Engineering College 57
Vel Tech High Tech Dr. Rangarajan Dr. Sakunthala Engineering College 58
Mepco Schlenk Engineering College (Autonomous) 73
PSNA College of Engineering and Technology 78
Kumaraguru College of Technology (Autonomous) 82
R.M.K. Engineering College, Kavaraipettai 84
Saveetha Engineering College 91
Sri Sai Ram Engineering College, Chennai 96
K.S. Rangasamy College of Technology (Autonomous) 99

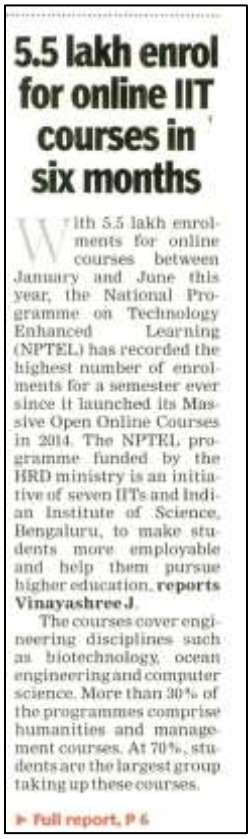
In TNEA 2017, Anna Universities following campuses allow counselling:

Anna University, Chennai CEG Campus

Anna University, Chennai ACT Campus
Anna University, Chennai SAP Campus
Anna University, Chennai MIT Campus

Note: In NIRF 2017 rankings, only 2,995 institutions participated. India has 39,000 registered colleges, 11,000 stand-alone institutions and over 760 universities, which means, the country hosts around 51,000 strong higher educational institutions. Of all these, less than 3,000 participated which is just about 6% of the overall higher educational institutions in the country.

Date: 22nd June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 1
Journalist: Vinayashree J
Professor: Professor Andrew Thangaraj
Headline: South students, teachers push up IIT online course enrolment
URL: http://timesofindia.indiatimes.com/city/chennai/south-students-teachers-push-up-iit-online-course-enrolment/articleshow/59262692.cms



5.5 lakh enrol for online IIT courses in six months

With 5.5 lakh enrolments for online courses between January and June this year, the National Programme on Technology Enhanced Learning (NPTEL) has recorded the highest number of enrolments for a semester ever since it launched its Massive Open Online Courses in 2014. The NPTEL programme funded by the HRD ministry is an initiative of seven IITs and Indian Institute of Science, Bengaluru, to make students more employable and help them pursue higher education, **reports Vinayashree J**.

The courses cover engineering disciplines such as biotechnology, ocean engineering and computer science. More than 30% of the programmes comprise humanities and management courses. At 70%, students are the largest group taking up these courses.

► Full report, P 6

South students, teachers push up IIT online course enrolment

Vinayashree.J
@timesgroup.com

Chennai: At least 75% of the 5.5 lakh enrolments recorded by the National Programme on Technology Enhanced Learning (NPTEL) was from the south zone comprising Kerala, Karnataka, Tamil Nadu, Telangana, Andhra Pradesh and Puducherry.

"In terms of both enrolments and exam registrations, the highest has been from the south zone," said Bharathi Balaji of NPTEL. A number of factors have been attributed to the high enrolment rates this year that indicates the growing popularity of Massive Open Online Courses (MOOC).

In 2016, the UGC and AICTE had come out with guidelines allowing transfer of credits obtained from approved online courses to marks in regular courses. This move could have been one of the reasons for the push in the numbers, said NPTEL officials.

> Courses will begin on July 24 or August 21, 2017 with examination dates in September 24 or October 22 respectively. For details log on to onlinecourses.nptel.ac.in

Another reason of this huge interest, especially from the south, was also attributed to the many awareness workshops carried out across campuses. About 80 such workshops were carried out in the southern states in the past year. Meanwhile, the upcoming session of July-November 2017 will have 116 new online courses. This is in addition to the previously offered 43 courses taking the total to 159 courses in the new semester. "We opened the portal just a few days ago and are already seeing many enrolments. While students seek courses for higher education, several faculty members too are enroling to reskill themselves. When it comes to professionals, we are noticing cases where they are interested to change career fields or work on upgrading themselves," said Balaji. For example, there are many taking up technical English courses.

While the NPTEL programmes are available in various disciplines, the bouquet also has courses on new cutting-edge technology, which seek to improve employability options in the technical domain such as cloud computing, data analytics and machine learning. Courses such as networks and systems, fluid dynamics and turbomachines will help candidates prepare for entrance tests to higher technical education too.

Professor Andrew Thangaraj, NPTEL coordinator at IIT Madras pointed out that it is a great opportunity for learners across the country to access the IIT and IISc systems as well as experts from other reputed institutions. "This enables learning without boundaries. You learn what you are interested in, and get a certificate confirming your abilities," he said.

Enroled candidates can pursue courses spanning over four to 12 weeks. All courses are free, only the optional certification examination comes at a fee of ₹1,000.

The courses will begin on July 24 or August 21, 2017 with examination dates in September 24 or October 22 respectively. Last day to enrol will be the start date of the course. For details, log on to https://onlinecourses.nptel.ac.in.

Date: 22nd June 2017
Publication: The Hans India
Edition: Hyderabad
Page no.: 14
Journalist: NA
Professor: Prof. Andrew Thangaraj
Headline: NPTEL offers 159 courses for July-November 2017 session
URL: http://www.thehansindia.com/posts/index/Young-Hans/2017-06-21/NPTEL-offers-159-courses-for-July-November-2017-session/307861

NPTEL offers 159 courses for July-November 2017 session

OUR BUREAU

Hyderabad: The National Programme on Technology Enhanced Learning (NPTEL) was initiated by seven Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. The online courses offered by NPTEL, unlike other popular MOOCs portals, include courses from all disciplines of Engineering such as Biotechnology, Ocean Engineering, and Metallurgical Sciences etc apart from the popular ones such as Computer Science Engineering or Electrical Engineering.

For July-November 2017 session, 159 courses are currently open for enrolment on the portal (https://nptel.ac.in). Among the 159, 43 are rerun of courses offered previously and 116 courses are new. The courses are offered by experts in their fields. For instance, the course "Patent Law for engineers and scientists" is offered by the Department of Industrial Policy and Promotion (DIPP) Chair Professor on Intellectual Property Rights (IPR), who is also a practising Madras High court lawyer. The course on "Programming in Python" and course on Algorithms is by Professor at CMI who is also the President of ACM, India, the leading professional body for all computer scientists.

Prof. Andrew Thangaraj, NPTEL coordinator at IIT Madras says, "It is a great opportunity for learners across the country to access the IIT and IISc systems as well as experts from other reputed institutions. This enables learning without boundaries. You learn what you are interested in, and get a certificate confirming your abilities in that area".

The content in every course is in depth and as taught in the IITs, which will provide any candidate who goes through it, a solid foundation and understanding of a topic. Some courses such as: Networks and Systems, Fluid dynamics and turbomachines, Strength of materials, etc will help candidates prepare for the entrance examination for higher technical education as well. The bouquet also has courses on current and cutting-edge technology, which will improve the employability of candidates in the technical domain too such as Internet of Things, Cloud Computing, Data Analytics and Machine Learning, MIMO/OFDM Cellular and Sensor Networks, etc.

NPTEL offers the course content in-depth and as taught in the IITs, which will provide any candidate who goes through it, a solid foundation and understanding of a topic

The objective of these courses is to make students employable in the industry or pursue a suitable higher education programme. Through an online portal, 4-, 8-, or 12-week online courses, typically on topics relevant to students in all years of higher education along with basic core courses in sciences and humanities with exposure to relevant tools and technologies, are being offered. The enrolment to and learning from these courses involves no cost. Following these online courses, an in-person, proctored certification examination will be conducted and a certificate is provided through the participating institutions.

The courses will begin on 24 July 2017 or 21 August 2017 with examination dates being September 24/October 22, 2017 (Sundays). Last day for enrolment to the courses will be the start date of the course.

Date: 22nd June 2017
Publication: Careers 360
Edition: Online
Journalist: Harshita Das
Professor: Prof. Andrew Thangara
Headline: NPTEL opens online enrollment for July-November 2017 session
URL: http://www.engineering.careers360.com/articles/nptel-opens-online-enrollment-for-july-november-2017-session

NPTEL opens online enrollment for July-November 2017 session

The National Programme on Technology Enhanced Learning (NPTEL) opened online enrollment for 159 courses of the July-November 2017 session. The courses for the current session can be enrolled on the official website of NPTEL. Out of 159 courses, 43 are rerun of courses offered previously and 116 courses are new.

Prof. Andrew Thangaraj, NPTEL coordinator at IIT Madras says, “It is a great opportunity for learners across the country to access the IIT and IISc systems as well as experts from other reputed institutions. This enables learning without boundaries. You learn what you are interested in, and get a certificate confirming your abilities in that area”.

NPTEL was initiated by seven Indian Institutes of Technology (IIT Bombay, IIT Delhi, IIT Kanpur, IIT Kharagpur, IIT Madras, IIT Guwahati and IIT Roorkee) along with the Indian Institute of Science, Bangalore in 2003. The online courses offered by NPTEL, unlike other popular MOOCs portals, include courses from all disciplines of Engineering such as Biotechnology, Ocean Engineering, Metallurgical Sciences etc apart from the popular ones such as Computer Science Engineering or Electrical Engineering. The courses are offered by experts in their fields.

The content in every course is in-depth and as taught in the IITs, which will provide any candidate who goes through it a solid foundation and understanding of a topic. Some courses such as- Networks and Systems, Fluid Dynamics and Turbomachines, Strength of Materials, etc. will help candidates prepare for the entrance examination for higher technical education as well. The bouquet also has courses on current and cutting-edge technology, which will improve the employability of candidates in the technical domain too such as Internet of Things, Cloud Computing, Data Analytics and Machine Learning, MIMO/OFDM Cellular and Sensor Networks, etc.

According to NPTEL, the objective of these courses is to make students employable in the industry or pursue a suitable higher education programme. Online courses of 4-, 8-, or 12-week duration on topics relevant to students in all years of higher education are offered. Along with that, basic core courses in sciences and humanities with exposure to relevant tools and technologies are also taught. The enrollment to and learning from these courses involves no cost. Following these online courses, an in-person, proctored certification examination will be conducted and a certificate is provided through the participating institutions.

The first course will begin on July 24, 2017 and the last one on August 21, 2017 with examination dates beginning from September 24 till October 22, 2017 (Sundays), scheduled according to the course's commencement date. Last day for enrollment to the courses will be the start date of the course.

Date: 22nd June 2017
Publication: Digital Learning
Edition: Online
Journalist: NA
Professor: Prof. Andrew Thangaraj
Headline: NPTEL to offer 116 new certification courses
URL: http://digitallearning.eletsonline.com/2017/06/nptel-to-offer-116-new-certification-courses/

NPTEL to offer 116 new certification courses

The National Programme on Technology Enhanced Learning (NPTEL) is soon going to offer 159 courses of which 116 will be the new ones and 43 older ones.

The new courses will be available for its July to November, 2017 session and are open for online enrollment (https://onlinecourses.nptel.ac.in)

The seven IITs (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bengaluru have initiated the NPTEL in 2003.

NPTEL coordinator at IIT Madras Prof Andrew Thangaraj said, “It is a great opportunity for learners across the country to access the IIT and IISc systems as well as experts from other reputed institutions. This enables learning without boundaries. You learn what you are interested in, and get a certificate confirming your abilities in that area.”

All courses are free and will begin from July 24, 2017 or August 21, 2017. The certification examination for courses is optional and comes at a fee of Rs 1000/course examination with examination dates being on September 24/October 22, 2017 (Sundays).

Date: 22nd June 2017
Publication: Skill Outlook
Edition: Online
Journalist: NA
Professor: Prof. Andrew Thangaraj
Headline: NPTEL, online learning platform by seven IITs and IISc Bangalore, offers 159 courses for July-November 2017 session; enrolment currently open on the portal
URL: http://skilloutlook.com/education/nptel-online-learning-platform-seven-iits-iisc-bangalore-offers-159-courses-july-november-2017-session-enrolment-currently-open-portal

NPTEL, online learning platform by seven IITs and IISc Bangalore, offers 159 courses for July-November 2017 session; enrolment currently open on the portal

Chennai: The National Programme on Technology Enhanced Learning (NPTEL) was initiated by seven Indian Institutes of Technology (Bombay, Delhi, Kanpur, Kharagpur, Madras, Guwahati and Roorkee) along with the Indian Institute of Science, Bangalore in 2003. The online courses offered by NPTEL, unlike other popular MOOCs portals, include courses from all disciplines of Engineering such as Biotechnology, Ocean Engineering, Metallurgical Sciences etc apart from the popular ones such as Computer Science Engineering or Electrical Engineering.

For July-November 2017 session, 159 courses are open for enrolment currently on the portal (https://onlinecourses.nptel.ac.in). Among the 159, 43 are rerun of courses offered previously and 116 courses are new. The courses are offered by experts in their fields. For instance, the course “Patent Law for engineers and scientists” is offered by the Department of Industrial Policy and Promotion (DIPP) Chair Professor on Intellectual Property Rights (IPR), who is also a practising Madras High court lawyer. The course on “Programming in Python” and course on Algorithms is by Professor at CMI who is also the President of ACM, India, the leading professional body for all computer scientists.

Date: 22nd June 2017
Publication: Skill Outlook
Edition: Online
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi & Prof. V. Jagadeesh Kumar
Headline: IIT Madras now offers an opportunity to its undergraduate and dual degree students to upgrade to Interdisciplinary Dual Degree (ID DD) programme
URL: http://skilloutlook.com/education/iit-madras-now-offers-opportunity-undergraduate-dual-degree-students-upgrade-interdisciplinary-dual-degree-id-dd-programme

IIT Madras now offers an opportunity to its undergraduate and dual degree students to upgrade to Interdisciplinary Dual Degree (ID DD) programme

Chennai: 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. These ID DD students will study for five years and obtain BTech in parent discipline and MTech 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. This is in addition to the B.Tech + M.Tech (Dual Degree programme), the Institute already offers in several conventional disciplines.

Prof. Bhaskar Ramamurthi, Director of IIT Madras says, “As a part of its endeavour 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.” Gradually it may expand to include more areas such as energy systems, battery technology, Internet of Things, Industry 4.0 and management. UG or DD students from any branch of engineering can upgrade to the Interdisciplinary Dual Degree programme, provided they meet certain academic criteria.

Date: 26th June 2017
Publication: The Hindu
Edition: Hyderabad/Delhi/Chennai/Kolkata
Page no: 04
Journalist: NA
Headline: NPTEL courses open now
URL: http://www.thehindu.com/todays-paper/tp-features/tp-educationplus/nptel-courses-open-now/article19147165.ece

NPTEL courses open now


T.E. RAJA SIMHAN

The National Programme on Technology Enhanced Learning (NPTEL) is currently offering 159 courses for their July-November 2017 session. Those who are interested can now enrol on the portal (https://onlinecourses.nptel.ac.in). NPTEL was initiated by seven Indian Institutes of Technology along with the Indian Institute of Science, Bangalore in 2003. Through the online portal, 4, 8, or 12-week online courses, typically on topics relevant to students in all years of higher education, along with basic core courses in sciences and humanities are being offered. The online courses also include all disciplines of engineering such as biotechnology, ocean engineering, metallurgical sciences and so on, apart from the popular ones such as computer science or electrical engineering. All courses are completely free to enrol and learn from. The certification examination is optional and comes at a fee of ₹1,000/course examination. The content in every course is in-depth and as taught in the IITs. The objective is to make students employable in the industry or pursue a suitable higher education programme. The courses will begin on July 24 or August 21 with examination dates being September 24/ October 22. Last day for enrolment to the courses will be the start date of the course. For more details, contact Sairam Radhakrishnan of IIT Madras' Media Cell at 9840108083 or sairam.radhakrishnan@footprintglobal.com.

IIT Madras is a multi-cultural campus

Date: 22nd June 2017
Publication: DT Next
Edition: Chennai
Page no.: 7
Journalist: NA
Headline: Chennai in perfect rhythm with Yoga Day
URL: http://www.dtnext.in/News/City/2017/06/22011819/1036811/Chennai-in-perfect-rhythm-with-Yoga-Day.vpf?TId=112132

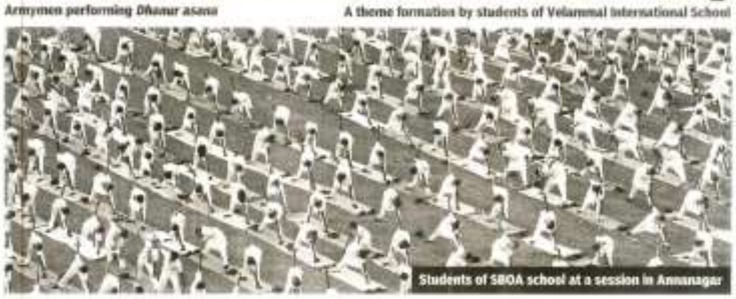
Chennai in perfect rhythm with Yoga Day

J Radhakrishnan, Health Secretary, in action at Omandurar Estate

A woman at a programme in YMCA ground and a private school student meditating on International Yoga Day on Wednesday in Chennai

A theme formation by students of Velammal International School

Armymen performing *Dhanur asana*



Students of SBOA school at a session in Annanagar

CHENNAI: On June 21, when World Yoga Day and World Music Day was observed, a melange of Carnatic music and yoga, titled 'Nada Yoga' resonated across living rooms and public spaces, not just in India, but also in New Zealand, USA, Canada, Europe and Middle East.

Institutions observe Yoga Day

Date: 22nd June 2017
Publication: Chennai Patrika
Edition: Online
Journalist: NA
Professor: Prof. M. S. Sivakumar
Alumni: Mr. Prashanth Vasu and Mr. Bharath Madhvan
Headline: 3rd International Day of Yoga observed at IIT Madras
URL: http://news.chennaipatrika.com/post/2017/06/21/3rd-International-Day-of-Yoga-observed-at-IIT-Madras.aspx

3rd International Day of Yoga observed at IIT Madras

Chennai, 21 June 2017: Indian Institute of Technology Madras (IIT Madras) observed 3rd International Day of Yoga on 21st June 2017 to generate awareness on healthier way of life for future generations. The event was presided by Prof. M. S. Sivakumar, Dean (Students) and Lt. Col. Jayakumar (Retd), Joint Registrar (Students) and students, faculty, and staff members of the Institute attended the event.

The Alumni of IITM Mr. Prashanth Vasu and Mr. Bharath Madhvan conducted a talk cum mediation practice session. Mr. Prashanth spoke on 'Experience the original intention of Yoga through heartfulness'. A Yoga session of about 45 minutes on 'Asanas, pranayama and meditation,' was organised. The session was led by Ms. Katyayini Reddy, who conducts yoga sessions at the Institute on a regular basis. Tadasna, Trikonasana, Pada-hastasna, Vrksasana and Surya Namaskar, to mention a few, were demonstrated during the occasion.

According to her, "Nowadays most people know the benefits of Yoga but they don't really realise the extent to which it benefits body and mind, Yoga brings discipline into life, as it makes the body as well as the mind healthy. Yoga is more like a health investment where you don't have to spend energy like other forms of exercise. Pranayama (a form of breathing practice) is also hugely beneficial to health, in this when we breathe using alternate nostrils we stimulate both hemispheres of brain and thus nervous system which in turn helps the endocrine system, thus helping us avoid most health issues related to hormones". Prior to the main event held today, a 'Yogathon' and a Yoga Quiz were held on 19th June 2017. The Yogathon was to test the participant's endurance and durability while performing yoga continuously for an hour with perfection in the Asanas. The participants were asked to perform based on instructions and a panel of volunteering Yoga experts. Suman Deb, Aswathy K Raghu and Yashwanth Pratap Kharwar were the top three winners of the competition.

TheYoga quiz was also held on 19th June 2017, with an endeavour to create awareness on yoga among the students. The questions focussed on knowledge of yoga, asanas, and their benefits. The winners of the quiz were Aravind IB, Naveen Minnie and P. Dileep Kumar.

IITM conducts yoga session at its Gymkhana Yoga studio on regular basis for students and staff members of the Institute. A booklet on Common Yoga Protocol was also distributed to the participants at the event.

Date: 22nd June 2017
Publication: The Better India
Edition: Online
Journalist: (Authored article by Lekshmi Priya S)
Alumni/students: Shashank Gupta, Shilpa Menon & Meena C
Headline: Internet, Education & More: How IIT-M Students Have Been Empowering TN & AP Villages for 12 Years
URL: http://www.thebetterindia.com/105886/iit-for-villages-iit-madras-student-volunteering-projects-rural-india/

Internet, Education & More: How IIT-M Students Have Been Empowering TN & AP Villages for 12 Years

Who said students can't bring about a change?

A student-run organisation based in Chennai has been engaging itself in rural welfare and empowerment projects for more than a decade and you probably haven't heard of it.

IIT for Villages or IViL is one amongst the numerous student organisations in the green, widespread campus of the Indian Institute of Technology-Madras.

Functioning as an action platform and a discussion forum, the student body was constituted in 2005, following a visit to a village near Chennai by a bunch of B. Tech students on an assignment.

While the assignment dealt with studying various avenues for interaction between rural side of the country and educational institutes, the students realised that a gap existed that could be bridged with collective involvement on their part.

Since then, IViL has been working on various projects including a used footwear collection drive, conducting science fests for rural children in nearby villages, empowering self help groups, to name a few.

"Approved by the campus Student Legislative Council (SLC) and guided by faculty advisors and Dean (Students), the organisation has a flexible, non-hierarchical and non-incentive system. Hence every member at IViL is called a volunteer and has equal right and opportunity to present their ideas and updates", says Shashank Gupta, an M.Sc Scholar and a volunteer at IViL.

IViL has also closely worked with few NGOs and CSR arms of companies like TVS Motors and Murugappa Group. "This helps us in understanding ground realities, collecting problems, discussing and implementing our solutions", he mentions.

Like a college that sends off a batch each year and welcomes a fresh one, IViL has always found volunteers from different departments and batches, year after year.

“Surprisingly, IViL has consistently attracted highly responsible individuals which makes it very interesting as a model. This goes to show that when you give people a lot of flexibility, the result is not that it breaks down because nobody cares enough. In fact, the reverse happens”, says Shilpa Menon, who is one of the longest serving volunteers of IViL.

Over the years, IViL has reached out to many villages across Tamil Nadu and Andhra Pradesh and has managed to engage the people from the villages in various campus-based events.

“Every year during Saarang and Shastra, which are the annual cultural fests in IIT-M, IViL puts up food stalls where village women cook and volunteers serve and manage the stalls. The entire profit earned is given to the ladies. This project is aimed at giving the women confidence in income generation and self-employment”, Shashank says.

Meena C, who joined IViL during these food stalls says, “Nothing needs to be spectacular. A few simple steps can bring change in you and society both”.

Some of the past projects include an eye care camp in collaboration with Shankar Nethralaya and setting up of libraries in different villages in Tamil Nadu.

Currently, the students are actively involved in various projects ranging from bicycle donation to online teaching projects for underprivileged children.

They have also conducted online counselling sessions between farmers & experts on paddy processing and dairy husbandry with the help of scientists from Indian Institute of Crop Processing and Technology (IICPT) and Tamil Nadu Veterinary and Animal Sciences University (TANUVAS).

Another awesome teaching project that the volunteers are part of includes the children of the campus mess workers.

The learning experience that a student experiences isn’t just restricted to social welfare.

“Apart from trying to make rural India better, IViL offers a unique platform to its volunteer to be a prospective social entrepreneur. It’s not only about the helping the needy, but also about learning many new things with unique experiences”, Shashank adds.

Date: 23rd June 2017
Publication: Career 360
Edition: Online
Journalist: Harshita Das
Professor: Prof. M. S. Sivakumar
Alumni: Prashanth Vasu and Mr. Bharath Madhvan
Headline: IIT Madras observes International Yoga Day
URL: http://www.engineering.careers360.com/articles/iit-madras-observes-international-yoga-day

IIT Madras observes International Yoga Day

The Indian Institute of Technology, Madras (IIT Madras) observed the third International Yoga Day on Wednesday, June 21, 2017 to generate awareness on healthier way of life for future generations. The event was presided by Prof. M. S. Sivakumar, Dean (Students) and Lt. Col. Jayakumar (Retd), Joint Registrar (Students) along with faculty, staff members and students of the institute.

The alumni of IIT Madras, Prashanth Vasu and Bharath Madhvan conducted a talk cum mediation practice session. Vasu spoke on 'Experiencing the original intention of Yoga through heartfulness'.

A 45-minute yoga session on 'Asanas, Pranayama and Meditation,' was organised. The session was led by Katyayini Reddy, who conducts yoga sessions at the institute on a regular basis. Tadasna, Trikonasana, Pada-hastasna, Vrksasana and Surya Namaskar, to mention a few, were demonstrated during the occasion.

According to Reddy, "Nowadays most people know the benefits of Yoga but they don't really realise the extent to which it benefits body and mind, Yoga brings discipline into life, as it makes the body as well as the mind healthy. Yoga is more like a health investment where you don't have to spend energy like other forms of exercise. Pranayama (a form of breathing practice) is also hugely beneficial to health. In this when we breathe using alternate nostrils we stimulate both hemispheres of brain and thus nervous system which in turn helps the endocrine system, thus helping us avoid most health issues related to hormones".

Prior to the main event held on Wednesday, a 'Yogathon' and a Yoga Quiz were held on June 19, 2017. The Yogathon was to test the participant's endurance and durability while performing yoga continuously for an hour with perfection in the Asanas. The participants were asked to perform based on instructions and a panel of volunteering Yoga experts. Suman Deb, Aswathy K Raghu and Yashwanth Pratap Kharwar were the three winners of the competition.

The Yoga quiz was held with an endeavour to create awareness on yoga among the students. The questions focussed on knowledge of yoga, asanas, and their benefits. The winners of the quiz were Aravind IB, Naveen Minnie and P. Dileep Kumar.

IITM conducts yoga session at its Gymkhana Yoga studio on regular basis for students and staff members of the Institute. A booklet on Common Yoga Protocol was also distributed to the participants at the event.

Date: 23rd June 2017
Publication: Kalvimalar
Edition: Online
Journalist: NA
Professor: Prof. M. S. Sivakumar
Alumni: Prashanth Vasu and Mr. Bharath Madhvan
Headline: IIT Madras observe yoga day
URL: http://kalvimalar.dinamalar.com/news-details.asp?id=24671&cat=1

IIT Madras observe yoga day

Chennai: Indian Institute of Technology Madras (IIT Madras) observed 3rd International Day of Yoga on 21st June 2017 to generate awareness on healthier way of life for future generations.

The event was presided by Prof. M. S. Sivakumar, Dean (Students) and Lt. Col. Jayakumar (Retd), Joint Registrar (Students) and students, faculty, and staff members of the Institute attended the event.

The Alumni of IITM Mr. Prashanth Vasu and Mr. Bharath Madhvan conducted a talk cum mediation practice session. Mr. Prashanth spoke on 'Experience the original intention of Yoga through heartfulness'.

A Yoga session of about 45 minutes on 'Asanas, pranayama and meditation,' was organised. The session was led by Ms. Katyayini Reddy, who conducts yoga sessions at the Institute on a regular basis. Tadasna, Trikonasana, Pada-hastasna, Vrksasana and Surya Namaskar, to mention a few, were demonstrated during the occasion.

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Date: 23rd June 2017
Publication: Skill Outlook
Edition: Online
Journalist: NA
Professor: Prof. M. S. Sivakumar
Alumni: Prashanth Vasu and Mr. Bharath Madhvan
Headline: 3rd International Day of Yoga celebrated in IITs
URL: http://skilloutlook.com/education/3rd-international-day-yoga-celebrated-iits

3rd International Day of Yoga celebrated in IITs

The 3rd International Day of Yoga celebrated in Indian Institutes of Technology. Indian Institute of Technology Madras (IIT Madras) observed 3rd International Day of Yoga on 21 June 2017 to generate awareness on healthier way of life for future generations. The event was presided by Prof. M. S. Sivakumar, Dean (Students) and Lt. Col. Jayakumar (Retd), Joint Registrar (Students) and students, faculty, and staff members of the Institute attended the event.

The Alumni of IIT Madras Mr. Prashanth Vasu and Mr. Bharath Madhvan conducted a talk cum mediation practice session. Mr. Prashanth spoke on 'Experience the original intention of Yoga through heartfulness'.

The Yoga session was held in the presence of Acharya Shirva Sudhesh Chand ji from Mysore. 15 Asanas were performed including basic Yoga asanas such as Shalabasana, pawanmuktasana, makrasana, among others followed by breathing exercises Kaapalabhaati and Pranayanam for fifteen minutes and meditation for six minutes. The main session was followed by therapeutic and Q&A sessions. Yoga Acharya said "A regular Yoga practice can offer all kinds of mental and physical health benefits. Some, like improved flexibility, are clearly evident. Others, including mental clarity and stress reduction, may be more subtle but are just as powerful."

With grand preparations and, in the true spirit of "Yoga", IIT Ropar also celebrated International Yoga Day on 21 June 2017. A three-hour long programme was held at Multipurpose Hall, in all, more than 100 people including Faculty, staff and Students took part.

The event was well publicized prior to its celebration which resulted in more than 100 yoga enthusiasts attending this event. The programme was properly arranged to spread awareness of yoga in all aspects, both for the uninitiated as well as the practitioners.

IIT Ropar recognized that Yoga provides a holistic approach to health and well-being and wider dissemination of information about the benefits of practicing Yoga for the better health is required.

Addressing the occasion, Prof. Sarit. K. Das, Director IIT Ropar said, "Yoga brings harmony in all walks of life and thus, is known for disease prevention, health promotion and management of many lifestyle-related disorders."

Yoga practice classes are already being run in the campus in the morning yoga session every day, covering shanthimanthra, warming up exercises, suryanamaskar, simple asanas, pranayama and savasana.

Date: 23rd June 2017
Publication: India Education Diary
Edition: Online
Journalist: NA
Professor: Prof. M. S. Sivakumar
Alumni: Prashanth Vasu and Mr. Bharath Madhvan
Headline: 3rd International Day of Yoga observed at IIT Madras
URL: https://indiaeducationdiary.in/3rd-international-day-yoga-observed-iit-madras/

3rd International Day of Yoga observed at IIT Madras

Chennai: Indian Institute of Technology Madras (IIT Madras) observed 3rd International Day of Yoga on 21st June 2017 to generate awareness on healthier way of life for future generations. The event was presided by Prof. M. S. Sivakumar, Dean (Students) and Lt. Col. Jayakumar (Retd), Joint Registrar (Students) and students, faculty, and staff members of the Institute attended the event.

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nervous system which in turn helps the endocrine system, thus helping us avoid most health issues related to hormones".

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IIT Madras is an industry friendly Institute

Date: 7th June 2017
Publication: Hindustan Times
Edition: Mumbai
Page no.: 18
Journalist: Dipanjan Sinha
Professor: Prof. Sriram Venkatachalam
Headline: New high for ties

New high for ties

Concerns over academic partnerships between India and the United Kingdom after BREXIT are put to rest with the announcement of 57 new joint research projects worth £1.6 million

Dipanjan Sinha

From climate change to methods of studying the humanities and game theory to tourism promotion in conflict zones, universities in the UK have tied up with counterparts in India for 57 projects worth a total of over £1.6 million, under the UK India Education Research Initiative (UKIERI), allaying fears of cuts on research funds and partnerships.

After Brexit, the UK's decision last year to exit the European Union, the Indian academic and student communities were concerned that partnerships might be affected.

"Post-Brexit, Indian students cannot even intern after their study in the UK. Tough measures like this have worried students about the interests of the British government in encouraging studies and research there," says Urvashi Malik, founder and MD of education consultancy firm College Core Education.

But UKIERI, the largest bilateral research partnership between India and the UK, has remained unaffected — and academics are taking that as a positive sign of things to come. So far, UKIERI has supported over 1,000 partnerships between the UK and India, benefitting 35,000 academics since 2006.

The announcement that there will be 57 collaborations this year helps clear the air, says S Parasuraman, director of the Tata Institute of Social Sciences (TISS). "This is the third phase of projects announced under UKIERI. It has been very useful in producing quality work in different fields," he adds.

TISS, for instance, is partnering with School of Oriental and African Studies (SOAS) of the University of London on a project establishing a UK-India research methods node to promote research training and collaboration in the social sciences and humanities. Elsewhere, the School of Hospitality & Tourism Management of Jammu University is partnering with the University of West London to examine how tourism can be a development tool for communities in a conflict region.

"A partnership of this kind is beneficial for the students, faculty and institutions in many ways," says director Parikshat Singh Manhas. "There will be student exchanges involved. From my own experience of being part of such exchanges, I can say that learning increases manifold."

STILL THE BIGGEST PARTNER

Though UK gave way to the US as the education destination for Indians decades ago, and is now in third place, behind Canada, as far as research partnerships are concerned, ties between the two remain the strongest.

There is no other country with a partnership that is nearly as significant, and the UK has spent over £35 million since 2006 on UKIERI alone, says education consultant Malik. The exposure helps students build a network that gives them a headstart in their career, adds Surajit Borkotokey, head of the department of mathematics and chairperson of the Centre for Computer Studies at Dibrugarh University, which is partnering with Queens University, Belfast, on a project on game theory. Such opportunities are also a great boost of confidence for Indian students.

• UK remains India's strongest partner for research partnership and exchange projects. ISTOCK

> A partnership of this kind is beneficial for students and faculty because learning increases manifold.
> PARIKSHAT SINGH MANHAS, professor, Jammu University

"Our students are not exposed to many advanced and sophisticated methods of research as found in the top universities of countries like the UK," says Borkotokey. "A visit to a university like Belfast makes them aware of what to even aspire to. And when students from these universities come to India, working with them enables an exchange of ideas with a much wider group."

MYTHS AND REALITY

"I believe part of the concern about Brexit is misplaced," says Sriram Venkatachalam, assistant professor in the department of ocean engineering at IIT-Madras, who will be working with City University, London, on a project on climate change.

Academic consultant Karan Gupta however points out that though UKIERI being unaffected is a positive sign, the major concerns remain unaddressed.

"The number of students who wish to study in the UK has been steadily declining over the past few years. A majority of students wish to work in the UK after they complete their education and the UK in general has made it extremely hard for international students to find employment there," he says.

"Brexit has only added to the perception that a British education will not help you find a job in the United Kingdom and will land you back home instead," says Gupta.

Date: 22nd June 2017
Publication: Commercial Vehicle
Edition: Online
Journalist: NA
Professor: Prof. Bhaskar Ramamurthi
Headline: Harita, IIT-M develop Intelliseat
URL: http://commercialvehicle.in/harita-iit-m-develop-intelliseat/

Harita, IIT-M develop Intelliseat

The Intelliseat developed by Harita Seating in association with IIT-M aims at minimising accidents by detecting driver fatigue.

Story & Photos:

Bhargav TS

In order to reduce road accidents due to driver fatigue, Harita Seating Systems Limited (HSSL), and the Indian Institute of Technology, Madras (IIT-M), have developed 'Intelliseat', an Internet of Things (IoT) device that monitors the performance and behaviour of the driver. To develop Intelliseat, HSSL joined hands with IITM two years ago. Operating independently, and capable of providing vehicle information like vehicle location, Intelliseat can be used for driver training and fleet risk evaluation as well. Capable of influencing fleet insurance and ownership costs, Intelliseat is expected to present Harita Seating a unique advantage.

Specialising in the manufacture of truck and tractor seats, the improvement of automotive seating system, particularly for the driver, has been a priority at HSSL. The company found out during its interaction with drivers and other industry stakeholders that professional drivers spend most of their time behind the wheel, and experience considerable fatigue. In case of people carriers, drivers experience more fatigue than the passengers experience. On an average, a truck or bus is driven for 10 hours a day. The drivers sometime tend to drive continuously, causing fatigue and leading to an accident. Developed as a performance monitoring tool, Intelliseat is engineered to detect fatigue. It will subsequently warn the driver, and signal him to take a break. This, in turn, would eliminate the possibility of an accident. Expressed AG Giridharan, President, HSSL, "Improvement of an automotive seating system, particularly that of the driver, is important to us."

Developed at the Rehabilitation Bioengineering Group, Department of Engineering Design, IIT Madras, Intelliseat, according to Prof. Venkatesh Balasubramanian, Department of Engineering Design, IIT Madras, was developed over a span of two years. A team from Harita and IIT Madras translated the conceptual work in the lab to a viable solution that can be productionised and applied. Expected to make roads safer, and have an impact on driver benchmarking (training) and fleet insurance, Intelliseat, developed to operate independent of any other system in the vehicle, can be used for in-vehicle information and tracking. Capable of being used for driver training and fleet risk evaluation, Intelliseat starts functioning as soon as the driver occupies it. The sensors detect his or her presence, and send a warning signal if there

is a movement. When the sensor senses minor fatigue, the driver is notified with a red signal on the dashboard. When the system senses a moderate fatigue, a chime goes of. If the situation goes out of control and the driver is close to dozing off, the Intelliseat vibrates. This makes a compelling reason for the driver to stop.

According to Prof. Bhaskar Ramamurthi, Director, IIT Madras, India has an unconscionably high rate of traffic accidents, and technologies that can reduce accidents due to driver fatigue are sorely needed. Tested in South India, Intelliseat will soon began testing in other parts of the country. Taking into account driver performance and behaviour, which is greatly influenced by physical and cognitive factors, Intelliseat, according to Ramamurthi, will elevate safety. The system's contribution would be to curb accidents by understanding driver behaviour, fatigue, and performance slippage. Appropriate intervention to avoid road accident looks like the best remedy.

Said C N Prasad, Director, HSSL, "It has always been the endeavour of Harita Seating to develop cost-effective technologies, which are relevant to the immediate Indian context. The joint development opportunity with IIT Madras for the Intelliseat showcases the results of such an endeavour. I hope that this innovation will lead to safer roads and reduce the risk of accidents due to driver fatigue."

Suppling seats to Ashok Leyland, Daimler India Commercial Vehicles, John Deere, M&M, Mercedes-Benz Buses, AMW, New Holland, TAFE, Tata Marcopolo and Tata Motors, HSSL has six plants in India. The mother plant is in Hosur. The other plants of the company are at Pune, Jamshedpur, Dharwad, Chennai and Pantnagar.

IIT Madras is a research-focused Institute

Date: 2nd June 2017
Publication: Deccan Chronicle
Edition: Online
Journalist: NA
Headline: Scientists detect gravity waves for the third time, could unravel how black hole form
URL: http://www.deccanchronicle.com/science/science/020617/scientists-detect-gravity-waves-for-the-third-time-could-unravel-how-black-hole-form.html

Scientists detect gravity waves for the third time, could unravel how black hole form

The Laser Interferometer Gravitational-wave Observatory (LIGO) said today that it had made another successful detection of gravitational waves, ripples in space and time, from the merger of two massive black holes that happened three billion light years away.

The new detection occurred on January 4 this year during the ongoing second observing run of the Advanced LIGO detectors in the US, which began on November 30, 2016.

The third event was produced by the merger of two black holes, 31 and 19 times as massive as the Sun, forming a larger black hole of about 49 solar masses.

Also, data suggests that at least one of the black holes in this binary system might have been spinning in a direction that is not completely aligned with the orbital rotation of the binary, providing potential clues on how these binaries might have formed.

"The new event also provides new opportunities to test Einstein's theory of general relativity.

"For example, this allowed us to confirm Einstein's prediction that gravitational waves should not undergo dispersion -- the phenomena of waves travelling at different speeds depending on their wavelength. Indian scientists played a leading role in deriving this result," said Sanjit Mitra from the Pune-based Inter-University Centre for Astronomy and Astrophysics (IUCAA), researchers of which have participated in the LIGO discoveries.

Mitra, Anirban Ain, Sukanta Bose, Sanjeev Dhurandhar, Bhooshan U Gadre, Sharad G Gaonkar, Nikhil Mukund, Jayanti Prasad and Tarun Souradeep --- all from IUCAA -- were part of the team.

Sixty-seven scientists from 13 Indian institutions are part of the LIGO Scientific Collaboration, under the umbrella of the Indian Initiative in Gravitational-Wave Observations (IndIGO).

The Indian team in LIGO includes scientists from CMI Chennai, ICTS-TIFR Bengaluru, IISER-Kolkata, IISER-Trivandrum, IIT-Bombay, IIT-Madras, IIT-Gandhinagar, IIT-Hyderabad, IPR Gandhinagar, IUCAA Pune, RRCAT Indore, TIFR Mumbai and UAIR Gandhinagar.

Indian scientists have done foundational work over the last three decades in modelling the signal waveforms and developing mathematical techniques to search for gravitational wave signals in noisy data.

A new generation of Indian scientists are expanding these contributions on several other frontiers. The publication has 40 authors from 11 Indian institutions.

The first direct observation of gravitational waves was made in September 2015 during the first observing run. A second detection was made in December 2015.

These detections were made possible by contributions from more than thousand researchers from many different countries, setting a great example in collaborative science.

There are only two LIGO laboratories in the world, both located in the US. The third laboratory is to come up in Hingoli district in Maharashtra.

Describing the achievements to be really satisfying, IUCAA Director Somak Raychaudhury said, "The continuing discoveries of GW events as expected shows how this subject is rapidly evolving into a distinct field of Science. I am proud that scientists in India, in particular at IUCAA, continue to play leading roles."

Date: 2nd June 2017
Publication: Business Standard
Edition: Online
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: LIGO detects gravitational waves for third time
URL: http://www.business-standard.com/article/current-affairs/ligo-detects-gravitational-waves-for-third-time-117060101739_1.html

LIGO detects gravitational waves for third time

In yet another historic moment, an international research team, including scientists from India, on Thursday announced the third detection of gravitational waves — ripples in the fabric of space and time which were first predicted by Albert Einstein more than a century ago.

The Laser Interferometer Gravitational-wave Observatory (LIGO) in the US made the detection on January 4 this year, demonstrating that a new window in astronomy has been firmly opened.

Gravitational waves pass through Earth and can be "heard" by the extremely sensitive LIGO detectors.

As was the case with the first two detections, the waves were generated when two black holes merged to form a larger black hole.

"Our handful of detections so far is revealing an intriguing black hole population we did not know existed until now," said Northwestern University's Vicky Kalogera, a senior astrophysicist with the LIGO Scientific Collaboration (LSC).

The new detection, called GW170104, occurred during the ongoing second observing run of the Advanced LIGO detectors which began on November 30 last year.

The first direct observation of gravitational waves was made in September 2015 during the first observing run.

A second detection was made in December 2015.

The third detection is described in a new paper accepted for publication in the journal Physical Review Letters.

The publication has 40 authors from 11 Indian institutions.

IIT-Madras recently joined the LSC as one of the participating institutes, under the leadership of Dr Chandra Kant Mishra.

The Chennai Mathematical Institute has also been contributing to the activities under the leadership of Dr KG Arun.

The group at IIT-Madras is involved in modelling the gravitational wave sources such as the ones which have been detected by the LIGO detectors so far as well as testing the consistency of the detected gravitational wave signals with the predictions of Einstein's general theory of relativity.

The third and latest detection points to merging black holes that are twice as far away from Earth as the two earlier pairs -- about three billion light-years away.

This time, the two black holes were unequal in size, one significantly lighter than the other. They merged into a black hole whose size is in the middle of the other two merged black hole pairs.

"Now we have three pairs of black holes, each pair ending their death spiral dance over millions or billions of years in some of the most powerful explosions in the universe. In astronomy, we say with three objects of the same type you have a class. We have a population, and we can do analysis," Kalogera added.

The newfound black hole, formed by the pair's merger, has a mass about 49 times that of our sun.

This fills in a gap between the masses of the two merged black holes detected previously by LIGO, which had solar masses of 62 (first detection) and 21 (second detection).

"We have further confirmation of the existence of black holes that are heavier than 20 solar masses, objects we didn't know existed before LIGO detected them," said David Shoemaker of MIT, the newly elected spokesperson for the LSC.

India is also working towards setting up its own LIGO observatory.

The move received in-principle approval from the cabinet in February last year and has made rapid progress towards the plan to join these exciting scientific observations in 2024.

LIGO-India will greatly enhance the scientific capabilities of the international network of observatories for astronomy, primarily by enabling precise pointing to the location of the gravitational wave events in the sky.

Scientific and engineering teams at IPR Gandhinagar, IUCAA Pune and RRCAT Indore are actively engaged in the pre-construction activities of LIGO-India.

Date: 2nd June 2017
Publication: News Nation
Edition: Online
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: Gravitational waves detected: Indian scientists contribute to the detection by LIGO team in US
URL: http://www.newsnation.in/science-news/gravitational-waves-detected-for-the-third-time-by-ligo-as-two-black-holes-merge-indian-scientists-involved-albert-einstein-article-172905.html

Gravitational waves detected: Indian scientists contribute to the detection by LIGO team in US

The Laser Interferometer Gravitational-wave Observatory (LIGO) in the US comprising of scientists from across the world, including those from India, has announced that the team has yet again detected gravitational waves for the third time. The gravitational waves are the ripples in the space that were first predicted by Albert Einstein more than a century ago.

The detection of third gravitational waves was made by LIGO on January 4 this year. The detection has firmly opened a new window in astronomy. The extremely sensitive LIGO detectors can hear the gravitational waves as they pass though the Earth.

While the first gravitational waves were detected in September 2015 during the first observing run, a second detection was made in December 2015.

The latest gravitational waves detection has been described in a new paper accepted for publication in the journal Physical Review Letters. Just like the first two detections, the waves occurred when two black holes merged to form a larger black hole.

"Our handful of detections so far is revealing an intriguing black hole population we did not know existed until now," said Northwestern University's Vicky Kalogera, a senior astrophysicist with the LIGO Scientific Collaboration (LSC).The new gravitational wave detection is called GW170104. It took place during the ongoing second observing run of the Advanced LIGO detectors which began on November 30, 2016.

40 authors in the publication belong to 11 Indian institutions. Under the leadership of Dr Chandra Kant Mishra, IIT-Madras recently joined the LSC as one of the participating institutes. Led by Dr K.G. Arun, the Chennai Mathematical Institute has also been contributing to the activities.

The IIT-Madras team models the sources of the gravitational wave such as the ones detected by the LIGO detectors so far. They also test the consistency of the detected gravitational wave signals with the predictions of Einstein's general theory of relativity.

The latest detection of gravitational waves shows how the black holes located twice as far away from Earth as the two earlier pairs – about three billion light-years away – merge.

This time around, the size of the two black holes was different with one significantly lighter than the other. They merged and formed a black hole whose size is in the middle of the other two merged black hole pairs.

"Now we have three pairs of black holes, each pair ending their death spiral dance over millions or billions of years in some of the most powerful explosions in the universe. In astronomy, we say with three objects of the same type you have a class. We have a population, and we can do analysis," Kalogera added.

The newly formed black hole has a mass of about 49 times that of our sun. This fills in a gap between the masses of the two merged black holes that were previously detected by LIGO. They had solar masses of 62 (first detection) and 21 (second detection).

"We have further confirmation of the existence of black holes that are heavier than 20 solar masses, objects we didn't know existed before LIGO detected them," said David Shoemaker of MIT, the newly elected spokesperson for the LSC.

India is also working towards setting up of its own LIGO observatory and the move had received approval from the cabinet in February last year. The LIGO observatory in India once set up will greatly enhance the scientific capabilities of the international network of observatories for astronomy.

Scientific and engineering teams at IPR Gandhinagar, IUCAA Pune and RRCAT Indore are actively involved in the pre-construction activities of LIGO-India.

India’s contribution in gravitational waves detection:

India’s strong efforts have been involved in these detections that were made by contribution from researchers from across the world. The scientists from India have performed foundational work over the last three decades in modelling the signal waveforms and developing mathematical techniques to search for gravitational wave signals in noisy data.

"With the third definite detection of from a coalescing black hole binary, we have discovered a new class of astrophysical sources to test Einstein's theory of general relativity in extreme conditions," Bala Iyer, the Principal Investigator of the Indian team in LIGO said.

Date: 2nd June 2017
Publication: The Huffington Post
Edition: Online
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: Scientists Detect The Third Gravitational Wave At LIGO
URL: http://www.huffingtonpost.in/2017/06/02/scientists-detect-the-third-gravitational-wave-at-ligo_a_22122196/

Scientists Detect The Third Gravitational Wave At LIGO

WASHINGTON / CHENNAI -- In yet another historic moment, an international research team, including scientists from India, on Thursday announced the third detection of gravitational waves -- ripples in the fabric of space and time which were first predicted by Albert Einstein more than a century ago.

The Laser Interferometer Gravitational-wave Observatory (LIGO) in the US made the detection on January 4 this year, demonstrating that a new window in astronomy has been firmly opened.

Gravitational waves pass through Earth and can be "heard" by the extremely sensitive LIGO detectors.

As was the case with the first two detections, the waves were generated when two black holes merged to form a larger black hole.

"Our handful of detections so far is revealing an intriguing black hole population we did not know existed until now," said Northwestern University's Vicky Kalogera, a senior astrophysicist with the LIGO Scientific Collaboration (LSC).

The new detection, called GW170104, occurred during the ongoing second observing run of the Advanced LIGO detectors which began on November 30 last year.

The first direct observation of gravitational waves was made in September 2015 during the first observing run.

A second detection was made in December 2015.

The third detection is described in a new paper accepted for publication in the journal Physical Review Letters.

The publication has 40 authors from 11 Indian institutions.

IIT-Madras recently joined the LSC as one of the participating institutes, under the leadership of Dr Chandra Kant Mishra.

The Chennai Mathematical Institute has also been contributing to the activities under the leadership of Dr K.G. Arun.

The group at IIT-Madras is involved in modelling the gravitational wave sources such as the ones which have been detected by the LIGO detectors so far as well as testing the consistency of the detected gravitational wave signals with the predictions of Einstein's general theory of relativity.

The third and latest detection points to merging black holes that are twice as far away from Earth as the two earlier pairs -- about three billion light-years away.

This time, the two black holes were unequal in size, one significantly lighter than the other. They merged into a black hole whose size is in the middle of the other two merged black hole pairs.

"Now we have three pairs of black holes, each pair ending their death spiral dance over millions or billions of years in some of the most powerful explosions in the universe. In astronomy, we say with three objects of the same type you have a class. We have a population, and we can do analysis," Kalogera added.

The newfound black hole, formed by the pair's merger, has a mass about 49 times that of our sun.

This fills in a gap between the masses of the two merged black holes detected previously by LIGO, which had solar masses of 62 (first detection) and 21 (second detection).

"We have further confirmation of the existence of black holes that are heavier than 20 solar masses, objects we didn't know existed before LIGO detected them," said David Shoemaker of MIT, the newly elected spokesperson for the LSC.

India is also working towards setting up its own LIGO observatory.

The move received in-principle approval from the cabinet in February last year and has made rapid progress towards the plan to join these exciting scientific observations in 2024.

LIGO-India will greatly enhance the scientific capabilities of the international network of observatories for astronomy, primarily by enabling precise pointing to the location of the gravitational wave events in the sky.

Scientific and engineering teams at IPR Gandhinagar, IUCAA Pune and RRCAT Indore are actively engaged in the pre-construction activities of LIGO-India.

Date: 2nd June 2017
Publication: Telangana Today
Edition: Online
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: Gravitational waves detected again, 4 Indian scientists contribute to study
URL: https://telanganatoday.com/gravitational-waves-indian-scientists

Gravitational waves detected again, 4 Indian scientists contribute to study

The Laser Interferometer Gravitational-wave Observatory (LIGO) has made another successful detection of gravitational waves. This firmly reiterates the remarkable launch, announced last year, of a new window of astronomy.

Chennai: The Laser Interferometer Gravitational-wave Observatory (LIGO) has made another successful detection of gravitational waves — ripples in space and time — from the merger of two massive black holes that happened three billion light years away. Four Indian scientists contributed to this particular study, whereas many more are part of LIGO.

The detection firmly reiterates the remarkable launch, announced last year, of a new window of astronomy.

Indian scientists contributed to developing and carrying out tests of Einstein's theory using this event, to the estimation of the properties of the remnant black hole, and to the search for possible electromagnetic flashes associated with this event. The Cadmium Zinc Telluride Imager (CZTI) on the Indian space observatory AstroSat conducted the most sensitive search for short duration Xray flashes associated with this event, but did not find anything. When an optical source potentially related to the LIGO event was discovered, the CZTI team joined hands with the international GROWTH collaboration to study it. This India-led study proved that the optical source was not related to this event.

67 scientists from 13 Indian institutions are part of the LIGO Scientific Collaboration, under the umbrella of the Indian Initiative in Gravitational-Wave Observations (IndIGO). The Indian team in LIGO includes scientists from CMI Chennai, ICTS-TIFR Bengaluru, IISER-Kolkata, IISERTrivandrum, IIT Bombay, IIT Madras, IIT Gandhinagar, IIT Hyderabad, IPR Gandhinagar, IUCAA Pune, RRCAT Indore, TIFR Mumbai and UAIR Gandhinagar. Some of the data analysis work were carried out using the high-performance computing facilities at IUCAA Pune and ICTS-TIFR Bengaluru.

IIT Madras, which recently joined the LIGO Scientific Collaboration as one of the participating institutes, under the leadership of Dr Chandra Kant Mishra, now is another host of Gravitational Wave activities in Chennai, together with the Chennai Mathematical Institute which has been contributing to the activities under the leadership of Dr KG Arun. The group at IIT Madras is involved in modelling the gravitational wave sources such as the ones which have been detected by the LIGO detectors so far as well as testing the consistency of the detected gravitational wave signals with the predictions of Einstein's general theory of relativity.

Specific to GW170104, the latest detection made by LIGO, Dr Mishra in collaboration with Anuradha Samajdar (a graduate student at IISER Kolkata), Rajesh Nayak (IISER-Kolkata) and KG Arun (CMI) contributed to the search for the evidence for "dispersion" of gravitational waves, an effect forbidden by Einstein's theory. The search showed no evidence for the dispersion of gravitational waves in the three detection LIGO has made, which is consistent with the predictions of Einstein's General Relativity.

The new detection occurred during the ongoing second observing run of the Advanced LIGO detectors in the USA, which began on November 30, 2016. The first direct observation of gravitational waves was made in September 2015 during the first observing run. A second detection was made in in December 2015. The third detection, made on January 4, 2017, is described in a new paper accepted for publication in the journal Physical Review Letters. These detection were made possible by contributions from more than thousand researchers from many different countries, setting a great example in collaborative science. Indian scientists have done foundation work over the last three decades in modelling the signal waveforms and developing mathematical techniques to search for gravitational wave signals in noisy data. A new generation of Indian scientists are expanding these contributions on several other frontiers. The publication has 40 authors from 11 Indian institutions.

The third event was produced by the merger of two black holes, 31 and 19 times as massive as the Sun, forming a larger black hole of about 49 solar masses. Also, the data suggests that at least one of the black holes in this binary system might have been spinning in a direction that is not completely aligned with the orbital rotation of the binary, providing potential clues on how these binaries might have formed. The new event also provides new opportunities to test Einstein's theory of general relativity. For example, this allowed us to confirm Einstein's prediction that gravitational waves should not undergo 'dispersion' — the phenomena of waves traveling at different speeds depending on their wavelength. Indian scientists played a leading role in deriving this result.

Meanwhile, the planned LIGO-India observatory, that received in-principle approval from the Union cabinet in February 2016, has made rapid progress towards the plan to join these exciting scientific observations in 2024. LIGO-India will greatly enhance the scientific capabilities of the international network of observatories for astronomy, primarily by enabling precise pointing to the location of the gravitational wave events in the sky. Scientific and engineering teams at IPR Gandhinagar, IUCAA Pune and RRCAT Indore are actively engaged in the pre-construction activities of LIGO-India.

LIGO is an international collaboration with members around the globe. Its observations are carried out by twin detectors in the USA — one in Hanford, Washington, and the other in Livingston, Louisiana. LIGO is funded by the National Science Foundation (NSF), and operated by MIT and Caltech, which conceived and built the project. Financial support for the Advanced LIGO project was led by NSF with Germany (Max Planck Society), the UK (Science and Technology Facilities Council) and Australia (Australian Research Council) making significant commitments and contributions to the project. More than 1,000 scientists from around the world participate in the effort through the LIGO Scientific Collaboration, which includes the GEO Collaboration. LIGO partners with the Virgo Collaboration, a consortium including 280 additional scientists throughout Europe supported by the Centre National de la Recherche Scientifique (CNRS), the

Istituto Nazionale di Fisica Nucleare (INFN), and Nikhef, as well as Virgo's host institution, the European Gravitational Observatory.

The CZT–Imager instrument onboard the AstroSat satellite is built by a consortium of Institutes across India, including TIFR Mumbai, VSSC Thiruvananthapuram, ISAC Bengaluru, IUCAA Pune, SAC Ahmedabad and PRL Ahmedabad. The Indian Space Research Organisation funded, managed and facilitated the project. GROWTH was project funded by the National Science Foundation under Grant No 1545949, and by the corresponding grant from the Science and Engineering Research Board, Department of Science and Technology, India.

Date: 2nd June 2017
Publication: The Free Press Journal
Edition: Mumbai
Page no.: 1
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: Gravitational wave detected for 3rd time
URL: http://www.freepressjournal.in/world/gravitational-wave-detected-for-3rd-time/1078624

CREATING RIPPLES IN FABRIC OF SPACE-TIME

Gravitational wave detected for 3rd time

• **AGENCIES**
Washington/Chennai

In yet another historic moment, an international research team, including scientists from India, on Thursday announced the third detection of gravitational waves – ripples in the fabric of space and time which were first predicted by Albert Einstein more than a century ago.

The Laser Interferometer Gravitational-wave Observatory (LIGO) in the US made the detection on January 4 this year, demonstrating that a new window in astronomy has been firmly opened.

Gravitational waves pass through Earth and can be "heard" by the extremely sensitive LIGO detectors.

As was the case with the first two detections, the waves were generated when two black holes merged to form a larger black hole.

"Our handful of detections so far is revealing an intriguing black hole population we did not know existed until now," said Northwestern University's Vicky Kalogera, a senior astrophysicist with the LIGO Scientific Collaboration (LSC).

The new detection, called GW170104, occurred during the ongoing second observing run of the Advanced LIGO detectors which began on November 30 last year.

The first direct observation of gravitational waves was made in September 2015 during the first observing run.

A second detection was made in December 2015.

The third detection is described in a new paper accepted for publication in the journal Physical Review Letters.

The publication has 40 authors from 11 Indian institutions.

IIT-Madras recently joined the LSC as one of the participating institutes, under the leadership of Dr Chandra Kant Mishra. – IANS

WHAT ARE GRAVITATIONAL WAVES?

Gravitational waves are 'ripples' in the fabric of space-time caused by some of the most violent and energetic processes in the Universe. Albert Einstein predicted the existence of gravitational waves in 1916 in his General Theory of Relativity. He showed that massive accelerating objects (like neutron stars or black holes orbiting each other) would disrupt space-time.

Date: 2nd June 2017
Publication: The Times of India
Edition: Online
Journalist: Chethan Kumar
Headline: Third gravitational wave detected; LIGO transiting into era of new astronomy
URL: http://timesofindia.indiatimes.com/home/science/third-gravitational-wave-detected-ligo-transiting-into-era-of-new-astronomy/articleshow/58948090.cms

Third gravitational wave detected; LIGO transiting into era of new astronomy

PARIS: The Laser Interferometer Gravitational-wave Observatory (LIGO), on Thursday said it has made another (third) successful detection of gravitational waves, ripples in space and time, from the merger of two massive black holes that happened three billion light years away, on January 4, 2017.

Scientists said that this reiterates their claims of having added a new window to the world of astronomy. The new detection occurred during the ongoing second observing run of the Advanced LIGO detectors in the USA, which began on November 30, 2016.

The first direct observation of gravitational waves was made in September 2015 during the first observing run and in quick succession, the second detection was made in December 2015.

The third detection has been described in a new paper accepted for publication in the journal Physical Review Letters.

These detections, which were made possible by contributions from more than thousand researchers from different countries, also had a strong Indian effort.

In fact, Indian scientists have done foundational work over the last three decades in modelling the signal waveforms and developing mathematical techniques to search for gravitational wave signals in noisy data. "With the third definite detection of from a coalescing black hole binary, we have discovered a new class of astrophysical sources to test Einstein's theory of general relativity in extreme conditions," Bala Iyer, the Principal Investigator of the Indian team in LIGO said.

Iyer is a Simons visiting professor at ICTS, Bengaluru. The ICTS group played a key role in developing and implementing an analysis that was used to test the consistency of the observed signals with general relativity. By combining results from multiple LIGO events, more precise constraints on deviations from the predictions of Einstein's theory were obtained.

Further, a new generation of Indian scientists are expanding these contributions on several other frontiers. The publication has 40 authors from 11 Indian institutions.

The third event, a specific statement shared with TOI read: "was produced by the merger of two black holes, 31 and 19 times as massive as the Sun, forming a larger black hole of about 49 solar masses. Also, the data suggests that at least one of the black holes in this binary system might have been spinning in a

direction that is not completely aligned with the orbital rotation of the binary, providing potential clues on how these binaries might have formed."

The new event, scientists say, also provides new opportunities to test Einstein's theory of general relativity. For example, this allowed scientists to confirm Einstein's prediction that gravitational waves should not undergo 'dispersion' - the phenomena of waves traveling at different speeds depending on their wavelength.

Indian scientists played a leading role in deriving this result.
Indian scientists contributed to developing and carrying out tests of Einstein's theory using this event, to the estimation of the properties of the remnant black hole, and to the search for possible electromagnetic flashes associated with this event.

The Cadmium Zinc Telluride Imager (CZTI) on the Indian space observatory AstroSat conducted the most sensitive search for short duration X-ray flashes associated with this event, but did not find anything.

"When an optical source potentially related to the LIGO event was discovered, the CZTI team joined hands with the international GROWTH collaboration to study it. This India-led study proved that the optical source was not related to this event," the statement read.

"...What has opened up is a new precision laboratory. By combining results from the large number of events that LIGO will observe in near future, we will be able to perform stringent tests of Einstein's theory," Parameswaran Ajith, the Principal Investigator of the nine-member ICTS team in LIGO said.

The team also contributed to the estimation of the mass and spin of the remnant black hole produced by the merger. By studying the masses and other properties of such binaries, future observations will tell us how exactly they are formed in nature.

THE STORY SO FAR
The planned LIGO-India observatory, that received in-principle approval from the Union cabinet in February 2016, has made rapid progress, scientists associated with the project say.
LIGO-India, they say will join the global observations by 2024.

"This will greatly enhance the scientific capabilities of the international network of observatories for astronomy, primarily by enabling precise pointing to the location of the gravitational wave events in the sky," a statement shared with TOI said.

Scientific and engineering teams at IPR Gandhinagar, IUCAA Pune and RRCAT Indore are actively engaged in the pre-construction activities of LIGO-India.

And, 67 scientists from 13 Indian institutions are part of the LIGO Scientific Collaboration, under the umbrella of the Indian Initiative in Gravitational-Wave Observations (IndIGO). The Indian team in LIGO includes scientists from CMI Chennai, ICTS-TIFR Bengaluru, IISER-Kolkata, IISER-Trivandrum, IIT Bombay,

IIT Madras, IIT Gandhinagar, IIT Hyderabad IPR Gandhinagar, IUCAA Pune, RRCAT Indore, TIFR Mumbai and UAIR Gandhinagar.

Some of the data analysis work were carried out using the high-performance computing facilities at IUCAA Pune and ICTS-TIFR Bengaluru.

LIGO is an international collaboration with members around the globe. Its observations are carried out by twin detectors in the USA - one in Hanford, Washington, and the other in Livingston, Louisiana.

Funded by the National Science Foundation (NSF), LIGO is operated by MIT and Caltech, which conceived and built the project.

Financial support for the Advanced LIGO project was led by NSF with Germany (Max Planck Society), the U.K. (Science and Technology Facilities Council) and Australia (Australian Research Council) making significant commitments and contributions to the project.

Date: 2nd June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 7
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: IIT-M scientists part of team involved in new LIGO discovery

IIT-M scientists part of team involved in new LIGO discovery

TIMES NEWS NETWORK

Chennai: The laser interferometer gravitational-wave observatory (LIGO) during its second observation of advanced LIGO detectors in USA which began on November 30, 2016 has successfully detected gravitational waves, from the merger of two massive black holes.

Under the leadership of Dr Chandra Kant Mishra, IIT-M has recently joined hands with LIGO as one of the participating institutes. IIT Madras has been involved in modelling the gravitational wave source which was the same as the one detected by LIGO detectors.

The third detection was made on January 4, 2017. There were contributions by more than 1000 researchers from many countries with Indian scientists contributing to the foundational work over the last three decades.

The new event provides opportunities to test Einstein's theory of general relativity. The latest detection by LIGO with respect to GW170104 has contributed to the search of evidence for gravitational waves.

LIGO has made a plan to join this existing scientific observation in 2024. The observatories for astronomy will greatly be enhanced by LIGO India.

LIGO involves the collaboration of 67 scientists from 13 institutions. Other than the 1000 scientists, 280 others throughout Europe are additional partners.

Date: 2nd June 2017
Publication: India Today
Edition: Online
Journalist: NA
Headline: LIGO detects gravitational waves for a third time
URL: http://indiatoday.intoday.in/story/ligo-detects-gravitational-waves-for-a-third-time/1/968855.html

LIGO detects gravitational waves for a third time

New Delhi, Jun 1 (PTI) The Laser Interferometer Gravitational-wave Observatory (LIGO) said today that it had made another successful detection of gravitational waves, ripples in space and time, from the merger of two massive black holes that happened three billion light years away.

The new detection occurred on January 4 this year during the ongoing second observing run of the Advanced LIGO detectors in the US, which began on November 30, 2016.

The third event was produced by the merger of two black holes, 31 and 19 times as massive as the Sun, forming a larger black hole of about 49 solar masses.

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"The new event also provides new opportunities to test Einsteins theory of general relativity.

"For example, this allowed us to confirm Einsteins prediction that gravitational waves should not undergo dispersion -- the phenomena of waves travelling at different speeds depending on their wavelength. Indian scientists played a leading role in deriving this result," said Sanjit Mitra from the Pune-based Inter-University Centre for Astronomy and Astrophysics (IUCAA), researchers of which have participated in the LIGO discoveries.

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The Indian team in LIGO includes scientists from CMI Chennai, ICTS-TIFR Bengaluru, IISER-Kolkata, IISER-Trivandrum, IIT-Bombay, IIT-Madras, IIT-Gandhinagar, IIT-Hyderabad, IPR Gandhinagar, IUCAA Pune, RRCAT Indore, TIFR Mumbai and UAIR Gandhinagar.

Indian scientists have done foundational work over the last three decades in modelling the signal waveforms and developing mathematical techniques to search for gravitational wave signals in noisy data. A new generation of Indian scientists are expanding these contributions on several other frontiers. The publication has 40 authors from 11 Indian institutions.

The first direct observation of gravitational waves was made in September 2015 during the first observing run. A second detection was made in December 2015.

These detections were made possible by contributions from more than thousand researchers from many different countries, setting a great example in collaborative science.

There are only two LIGO laboratories in the world, both located in the US. The third laboratory is to come up in Hingoli district in Maharashtra.

Describing the achievements to be really satisfying, IUCAA Director Somak Raychaudhury said, "The continuing discoveries of GW events as expected shows how this subject is rapidly evolving into a distinct field of Science. I am proud that scientists in India, in particular at IUCAA, continue to play leading roles." PTI PR SMN

Date: 2nd June 2017
Publication: PTI
Edition: Online
Journalist: NA
Headline: LIGO detects gravitational waves for a third time
URL: http://www.ptinews.com/news/8759540_LIGO-detects-gravitational-waves-for-a-third-time.html

LIGO detects gravitational waves for a third time

New Delhi, Jun 1 (PTI) The Laser Interferometer Gravitational-wave Observatory (LIGO) said today that it had made another successful detection of gravitational waves, ripples in space and time, from the merger of two massive black holes that happened three billion light years away.

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Date: 2nd June 2017
Publication: The Indian Express
Edition: Online
Journalist: NA
Headline: LIGO detects gravitational waves for a third time as two blackholes merge
URL: http://indianexpress.com/article/technology/science/ligo-detects-gravitational-waves-for-a-third-time-4685829/

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Date: 2nd June 2017
Publication: News 18
Edition: Online
Journalist: NA
Professor: Prof. Chandra Kant Mishra
Headline: LIGO Detects Gravitational Waves For Third Time
URL: http://www.news18.com/news/tech/ligo-detects-gravitational-waves-for-third-time-1419905.html

LIGO Detects Gravitational Waves For Third Time

In yet another historic moment, an international research team, including scientists from India, has announced the third detection of gravitational waves -- ripples in the fabric of space and time which were first predicted by Albert Einstein more than a century ago.

The Laser Interferometer Gravitational-wave Observatory (LIGO) in the US made the detection on January 4 this year, demonstrating that a new window in astronomy has been firmly opened.

Gravitational waves pass through Earth and can be "heard" by the extremely sensitive LIGO detectors.

As was the case with the first two detections, the waves were generated when two black holes merged to form a larger black hole.

"Our handful of detections so far is revealing an intriguing black hole population we did not know existed until now," said Northwestern University's Vicky Kalogera, a senior astrophysicist with the LIGO Scientific Collaboration (LSC).

The new detection, called GW170104, occurred during the ongoing second observing run of the Advanced LIGO detectors which began on November 30 last year.

The first direct observation of gravitational waves was made in September 2015 during the first observing run.

A second detection was made in December 2015.

The third detection is described in a new paper accepted for publication in the journal Physical Review Letters.

The publication has 40 authors from 11 Indian institutions.

IIT-Madras recently joined the LSC as one of the participating institutes, under the leadership of Dr Chandra Kant Mishra.

The Chennai Mathematical Institute has also been contributing to the activities under the leadership of Dr K.G. Arun.

The group at IIT-Madras is involved in modelling the gravitational wave sources such as the ones which have been detected by the LIGO detectors so far as well as testing the consistency of the detected gravitational wave signals with the predictions of Einstein's general theory of relativity.

The third and latest detection points to merging black holes that are twice as far away from Earth as the two earlier pairs -- about three billion light-years away.
This time, the two black holes were unequal in size, one significantly lighter than the other. They merged into a black hole whose size is in the middle of the other two merged black hole pairs.

"Now we have three pairs of black holes, each pair ending their death spiral dance over millions or billions of years in some of the most powerful explosions in the universe. In astronomy, we say with three objects of the same type you have a class. We have a population, and we can do analysis," Kalogera added.

The newfound black hole, formed by the pair's merger, has a mass about 49 times that of our sun.

This fills in a gap between the masses of the two merged black holes detected previously by LIGO, which had solar masses of 62 (first detection) and 21 (second detection).

"We have further confirmation of the existence of black holes that are heavier than 20 solar masses, objects we didn't know existed before LIGO detected them," said David Shoemaker of MIT, the newly elected spokesperson for the LSC.

India is also working towards setting up its own LIGO observatory.

The move received in-principle approval from the cabinet in February last year and has made rapid progress towards the plan to join these exciting scientific observations in 2024.

LIGO-India will greatly enhance the scientific capabilities of the international network of observatories for astronomy, primarily by enabling precise pointing to the location of the gravitational wave events in the sky.

Scientific and engineering teams at IPR Gandhinagar, IUCAA Pune and RRCAT Indore are actively engaged in the pre-construction activities of LIGO-India.

Date: 2nd June 2017
Publication: The Economic Times
Edition: Online
Journalist: NA
Headline: LIGO detects gravitational waves for third time
URL: http://economictimes.indiatimes.com/news/science/ligo-detects-gravitational-waves-for-third-time/articleshow/58958990.cms

LIGO detects gravitational waves for third time

BOSTON: LIGO scientists, including those from India, have for the third time successfully detected gravitational waves - ripples in space and time - generated by a merger of two massive black holes three billion light years away from Earth.

The new black hole, formed by the merger, has a mass about 49 times that of our Sun.

The finding confirms predictions made by the general theory of relativity which German scientist Albert Einstein formulated over 100 years ago.

The detection fills in a gap between the masses of the two merged black holes detected previously by The Laser Interferometer Gravitational-wave Observatory (LIGO), with solar masses of 62 (first detection) and 21 (second detection).

"We have further confirmation of the existence of stellar-mass black holes that are larger than 20 solar masses - these are objects we didn't know existed before LIGO detected them," said David Shoemaker, spokesperson for the LIGO Scientific Collaboration (LSC), a body of more than 1,000 international scientists.

"It is remarkable that humans can put together a story, and test it, for such strange and extreme events that took place billions of years ago and billions of light-years distant from us," said Shoemakers from the Massachusetts Institute of Technology (MIT) in the US.

The new detection occurred during LIGO's current observing run, which began November 30 last year.

LIGO observations are carried out by twin detectors located in Washington and Louisiana in the US.

Sixty-seven scientists from 13 Indian institutions are part of the LIGO Scientific Collaboration, under the umbrella of the Indian Initiative in Gravitational-Wave Observations (IndIGO).

The Indian team in LIGO includes scientists from the Chennai Mathematical Institute, Tata Institute of Fundamental Research (TIFR) Bengaluru, TIFR Mumbai, Indian Institute of Science Education and Research (IISER) Kolkata, IISER Trivandrum, Indian Institute of Technology (IIT) Bombay, IIT Madras, IIT Gandhinagar, and IIT Hyderabad.

LIGO made the first-ever direct observation of gravitational waves in September 2015 during its first observing run since undergoing major upgrades in a programme called Advanced LIGO.

The second detection was made in December 2015. The third detection, called GW170104 was made on January 4 this year.

In all three cases, each of the twin detectors of LIGO detected gravitational waves from the tremendously energetic mergers of black hole pairs.

These are collisions that produce more power than is radiated as light by all the stars and galaxies in the universe at any given time.

The recent detection appears to be the farthest yet, with the black holes located about 3 billion light-years away.

The black holes in the first and second detections are located 1.3 and 1.4 billion light-years away, respectively.

The study also puts Albert Einstein's theories to the test. For example, the researchers looked for an effect called dispersion, which occurs when light waves in a physical medium such as glass travel at different speeds depending on their wavelength; this is how a prism creates a rainbow.

Einstein's general theory of relativity forbids dispersion from happening in gravitational waves as they propagate from their source to Earth. LIGO did not find evidence for this effect.

"It looks like Einstein was right - even for this new event, which is about two times farther away than our first detection," said Laura Cadonati of Georgia Institute of Technology in the US.

"We can see no deviation from the predictions of general relativity, and this greater distance helps us to make that statement with more confidence," said Cadonati.

The finding will be published in the journal Physical Review Letters.

Date: 2nd June 2017
Publication: The Asian Age
Edition: Online
Journalist: NA
Headline: LIGO detects gravitational waves for a third time
URL: http://www.asianage.com/science/020617/ligo-detects-gravitational-waves-for-a-third-time.html

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Date: 2nd June 2017
Publication: International Business Times
Edition: Online
Journalist: Kukil Bora
Headline: Einstein was right! LIGO detects gravitational waves for third time, confirming new population of black holes
URL: http://www.ibtimes.co.in/einstein-was-right-ligo-detects-gravitational-waves-third-time-confirming-new-population-black-729045

Einstein was right! LIGO detects gravitational waves for third time, confirming new population of black holes

The Laser Interferometer Gravitational-wave Observatory (LIGO) in the US has successfully made its third detection of gravitational waves, marking yet another human achievement in the world of astronomy. The latest detection is expected to help astronomers better understand the invisible deep space ripples, which were first predicted by Albert Einstein more than 100 years ago.

LIGO made the third detection of gravitational waves, called GW170104, on January 4. And, like in the case of the previous detections, the newly observed waves also resulted from a collision of two black holes to form a larger black hole. According to astronomers, the new black hole has a mass about 49 times that of the sun.

LIGO, which is equipped with sensors that are extremely sensitive to gravitational waves passing through Earth, made the first observation of gravitational waves in September 2015, followed by the second detection in December 2015. The findings from the third detection are described in a new study, published in the journal Physical Review Letters on Thursday.

The three confirmed detections by LIGO, along with "one lower-confidence detection," has revealed a population of intriguing black holes that are much larger than what was known before, according to astronomers.

"This is the first time that we have evidence that the black holes may not be aligned, giving us just a tiny hint that binary black holes may form in dense stellar clusters," Bangalore Sathyaprakash of Penn State and Cardiff University, one of the editors of the new paper, said in a statement.

According to NASA, gravitational waves are incredibly fast ripples in space that can travel at the speed of light (about 299,338 kilometres per second), and would squeeze and stretch anything in their path as they pass by.

In addition to merger of black holes, gravitational waves can also be formed when a star exploded asymmetrically resulting in a supernova, or when two big stars orbit each other. As Einstein had predicted more than a decade ago, these waves would spread out like the ripples in a pond when you through a stone into it.

"It looks like Einstein was right—even for this new event, which is about two times farther away than our first detection," Laura Cadonati of Georgia Tech and the Deputy Spokesperson of the LIGO Scientific Collaboration (LSC), said. "We can see no deviation from the predictions of general relativity, and this greater distance helps us to make that statement with more confidence."

The latest study on the third detection of gravitational waves by LIGO has 40 authors from 11 Indian institutions, including IIT-Madras and Chennai Mathematical Institute.

Meanwhile, India is also reportedly working towards setting up its own LIGO observatory, which had already been approved by the cabinet in February last year.

Date: 3rd June 2017
Publication: The Statesman
Edition: Delhi
Page no.: 13
Journalist: NA
Headline: LIGO Detects Gravitational Waves for third Time
URL: http://www.thestatesman.com/science/ripples-in-space-gravitational-waves-detected-for-third-time-1496380264.html

LIGO detects gravitational waves for third time

PRESS TRUST OF INDIA
BOSTON, JUN 2

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Date: 5th June 2017
Publication: The Times of India- Education Times
Edition: Delhi
Page no.: 16
Journalist: (Authored article by Aditya Lolla)
Headline: Change the line

What researchers are doing to fuel developments in the age of industry 4.0

CHANGE THE LINE

ADITYA LOLLA
PROJECT OFFICER, CENTRE FOR DECENTRALISED POWER SYSTEMS, IIT-MADRAS

TODAY, India is pushing for a future powered by solar energy with a vision of 50% of electrical power from renewable technologies by 2030. However, all the decentralised rooftop solar deployments so far have been subsidy-driven. They have not had a significant reach in Indian homes. However, this narrative is, today, being changed by a solar DC inverterless solution.

With the maturing of electronics, electrically powered homes and office appliances are becoming more energy-efficient, using only direct current (DC). To power them on an existing AC power line, each such device needs an AC-to-DC converter which adds to the losses, costs and unreliability. The Centre for Decentralised Power Systems (CDPS) at IIT-Madras took a step to suggest conversion of an in-home power-line to 48V DC to directly power DC appliances and use rooftop solar power as a source. It resulted in an energy-efficient solution for homes and offices available today.

India is fortunate to have good sunshine. It has a promising renewable energy source of power to utilise. A rooftop solar system, when directly used to power a DC line, offers the lowest-cost decentralised source of electricity to supplement power on the grid. With the addition of small batteries, this system promises energy delivery even during load-shedding and long power outages. More importantly, solar-DC is also a viable solution for powering homes in remote, off-grid areas, due to its reliability, affordability and its operation without dependency on the grid.

A solar-DC innovation using a DC power-line, DC loads and DC solar generation and batteries has the potential to be deployed at each home in India. It can be taken up worldwide. A simple solar DC deployment in a home can comprise a 125-Wp solar panel, a specially designed 1-kWh lead-acid battery with an expected life span of 1,600 cycles (compared with about 600 cycles for a normal battery), and an inverterless controller box powering a full-size DC fan, a dimmable LED tubelight, a remote control for the fan and tubelight, an LED lightbulb, and a cellphone charger. The system involves a bluetooth low-energy interface and cloud technology as well. The homeowner can also add extra lights or a TV set or other DC appliances to this line, as long as the overall system sizing is done appropriately. Interestingly, the entire set-up of such systems is being manufactured and installed for a fraction of the cost of traditional grid electrification (see box on cost savings).

The technology has already been deployed at 4,000 homes in 71 villages across the districts of Jodhpur and Jaisalmer in Rajasthan. Deployment in 7,200 off-grid homes in several districts of Assam is underway. Apart from this, several villages across the country are being powered through this technology. These include Belagavadi in Karnataka, Alandur (Trichy) in Tamil Nadu, and some villages in Odisha, Andhra Pradesh and Telangana, besides several homes on IIT-Madras campus.

Cost savings

A solar DC inverterless system for small homes offers

- **Affordable power for off-grid homes**
- **Uninterrupted power at lower prices for on-grid homes with load-shedding**
- **Reduced power costs for on-grid homes even when there is no load-shedding**

What one spends per day by using different power systems

Type of Home	AC system with AC loads	AC system with DC loads	DC System with DC loads*
Off-grid	Rs 22.4	Rs 8.2	Rs 5.1
6 hrs load shed	Rs 9.2	Rs 3.5	Rs 2.6
No load shed	Rs 6.4	Rs 2.7	Rs 2.4

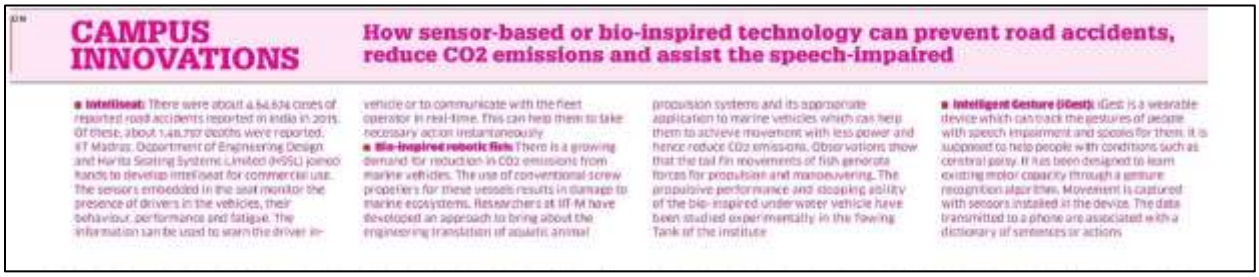
Note | Solar panel and battery sizes vary with the scenario. A typical, small home has the following load usage (number of hours appliances are used):

Appliance	Tubelight	Fan	Bulb	Mobile	TV
Numbers	1	1	1	1	1
Usage (hrs)	5	6	10	4	5

*Refers to IIT-M's solar DC inverterless system driving DC loads

IIT Madras Research Park, an independent, not-for- profit company supported by the institute and its alumni network, connects industry personnel with 'innovation inputs' of knowledge. It acts as a catalyst for collaborative and disruptive development of high-tech products. Apart from corporate R&D centres (60), it is home to centres of excellence (4), incubators (4), and incubated start-ups (115)

Date: 5th June 2017
Publication: The Times of India- Education Times
Edition: Delhi
Page no.: 16
Journalist: NA
Headline: Campus Innovations



CAMPUS INNOVATIONS

How sensor-based or bio-inspired technology can prevent road accidents, reduce CO2 emissions and assist the speech-impaired

Intelliseat: There were about 4,64,674 cases of reported road accidents reported in India in 2015. Of these, about 1,48,707 deaths were reported. IIT Madras, Department of Engineering Design and Harita Seating Systems Limited (HSSL) joined hands to develop IntelliSeat for commercial use. The sensors embedded in the seat monitor the presence of drivers in the vehicles, their behaviour, performance and fatigue. The information can be used to warn the driver in-vehicle or to communicate with the fleet operator in real-time. This can help them to take necessary action instantaneously

Bio-inspired robotic fish: There is a growing demand for reduction in CO2 emissions from marine vehicles. The use of conventional screw propellers for these vessels results in damage to marine ecosystems. Researchers at IIT-M have developed an approach to bring about the engineering translation of aquatic animal propulsion systems and its appropriate application to marine vehicles which can help them to achieve movement with less power and hence reduce CO2 emissions. Observations show that the tail fin movements of fish generate forces for propulsion and manoeuvering. The propulsive performance and stopping ability of the bio-inspired underwater vehicle have been studied experimentally in the Towing Tank of the institute

Intelligent Gesture (iGest): iGest is a wearable device which can track the gestures of people with speech impairment and speaks for them. It is supposed to help people with conditions such as cerebral palsy. It has been designed to learn existing motor capacity through a gesture recognition algorithm. Movement is captured with sensors installed in the device. The data transmitted to a phone are associated with a dictionary of sentences or actions

Date: 6th June 2017
Publication: Puthiya Thalaimurai TV
Edition: Electronic
Journalist: Mr. Manimaran
Alumni/student: W. Keerthana
Headline: Plastic Wastes can be re-used

Date: 7th June 2017
Publication: The Times of India
Edition: Ahmedabad
Page no.: 2
Journalist: NA
Professor: Prof. T Pradeep
Headline: 'Unsustainable use in farming depleting groundwater'
URL: http://timesofindia.indiatimes.com/city/ahmedabad/unsustainable-use-in-farming-depleting-groundwater/articleshow/59025404.cms

'Unsustainable use in farming depleting groundwater'

TIMES NEWS NETWORK

Ahmedabad: Professor of Indian Institute of Technology, Madras (IIT-Madras), **T Pradeep**, known for inventing water purifiers that provide drinking water for Rs1/3 a year for a family, delivered a talk at Indian Institute of Technology-Gandhinagar (IITGn) on Tuesday. He said that use of groundwater in an unsustainable manner for farming is leading to its depletion.

Pradeep made his observations in his talk, "Clean Water Using Advanced Materials: Science, Incubation and Industry" delivered for an annual public lecture series, "Roddam Narasimha Distinguished Lecture", at IIT-Gn. Set up in 2012, the lecture series brings various professionals to the institute to present their works in areas of national importance.

During the talk, Pradeep shared glimpses of global issues related to accessibility of clean and affordable drinking water. He said that though being scarce, potable water is being used in mindless ways.

"It is ridiculous that the groundwater is pumped up extensively and used for farming in an unsustainable fashion," said Pradeep, adding, "If efficient methods of water purification are developed, then the issue of groundwater depletion will be addressed effectively," he said.

The chemistry professor and his team of students have developed affordable nanocomposites which can filter microbes and toxic components such as arsenic, lead and other contaminants to provide clean and safe drinking water. The nano-composites which look like and behave like sand, filters the water as it passes through, without requiring electricity. Pradeep, who has recently co-founded a company for research and manufacturing in clean water technology said, "We have implemented purification systems for several arsenic affected parts of India. In the next 12 months, we are expected to provide arsenic free water to 10,00,000 people."

Pradeep has authored over 300 scientific papers and more than 75 patents and patent applications. His arsenic removal technology has reached about 600,000 people so far.

Date: 7th June 2017
Publication: The Indian Express
Edition: Ahmedabad
Page no.: 4
Journalist: NA
Professor: Prof. T Pradeep
Headline: 'Potable water used mindlessly'

'Potable water used mindlessly'

Ahmedabad: Indian Institute of Technology, Madras, (IIT-Madras) professor T Pradeep on Tuesday said potable water is being used in mindless ways even though it is scarce.

The researcher who invented water purifiers that provide drinking water for Rs 130 per year for a family, was speaking on "Clean water using advanced materials: Science, Incubation and Industry" at annual Roddam Narasimha Distinguished Lecture in IIT, Gandhinagar.

He spoke about global issues related to accessibility of clean and affordable drinking water. "It is ridiculous that the ground water is pumped up extensively and used for farming in an unsustainable fashion." **ENS**

Date: 7th June 2017
Publication: Divya Bhaskar
Edition: Ahmedabad
Page no.: 1
Journalist: NA
Professor: Prof. T Pradeep
Headline: 'Unsustainable use in farming depleting groundwater'

આઈઆઈટી ગાંધીનગર ખાતે સ્વચ્છ અને સસ્તાં પાણી પર વાત કરતાં પ્રો. ટી. પ્રદિપે કહ્યું કે,

ભૂગર્ભ જળ સપાટીનું ઘટતું સ્તર વિશ્વ માટે ખતરો

સિટી રિપોર્ટર @ahm_cb

ઈન્ડિયન ઈન્સ્ટિટ્યુટ ઓફ ટેકનોલોજી (આઈઆઈટી) ગાંધીનગર ખાતે 'રુદમ નરસિમ્હામાં ડિસ્ટિંગ્વિશ્ડ એન્યુઅલ લેક્ચર સિરિઝ' હેઠળ આઈઆઈટી મદ્રાસના પ્રોફેસર અને 130 રૂપિયામાં દૂષિત પાણીને સ્વચ્છ કરી આપનાર પ્લોરીફાઈડ સિસ્ટમ ઈનોવેટ કરનાર ટી. પ્રદિપનુ લેક્ચર યોજાયુ હતું. જેમાં તેમણે 'ક્લિન વોટર થ્રુ ઈંગ એડવાન્સ મટિરિયલ્સ: સાયન્સ ઈક્યુબેશન એન્ડ ઈન્ડસ્ટ્રીઝ' વિષય પર વાત કરી હતી.

પ્રોફેસર ટી. પ્રદિપે કહ્યું કે, 'ભારત સહિત વિશ્વમાં ભૂગર્ભ જળની સપાટી ખૂબ ઝડપથી નીચે જઈ રહી છે. ભૂગર્ભમાં પાણીના ઉંડા જવાના કારણે નવી સમસ્યા સામે આવી રહી છે. વળી આપણે ત્યા ખેતી માટે પમ્પ દ્વારા ભૂગર્ભમાંથી જે જળ ખેંચવામાં આવે છે, તે રીત પણ ખોટી છે. જેને લીધે પણ પાણીનું સ્તર નીચે જઈ રહ્યું છે. ભૂગર્ભ જળ સપાટીનું ઘટતું જતું સ્તર ભારત અને વિશ્વ માટે ખતરાનો સંકેત છે. પ્રોફેસરે પોતાની સ્ટુડન્ટ્સ ટીમ સાથે મળીને પાણીને સ્વચ્છ કરવાની નેનો ટેકનોલોજી વિશે વાત કરતા કહ્યું કે, 'મદ્રાસ આઈઆઈટીની લેબમાં અમે 130 રૂપિયામાં એક પરિવારને આખા વર્ષનું પીવાનું પાણી મળી રહે તેવી નેનો ટેકનોલોજી વિકસાવી છે. આ ટેકનોલોજી રેતી ફોર્મેટમાં છે. એક ખોરીફિકેશનની મદદથી જ્યારે આ રેતી પાણી સાથે ભળે છે ત્યારે પાણીમાં રહેલા દુષિત તત્વોને તે દૂર કરી પાણીને શુદ્ધ કરે છે. જેમાં વીજળીનો ઉપયોગ થતો નથી.'

• આઈઆઈટી મદ્રાસના પ્રોફેસર ટી. પ્રદીપે વિદ્યાર્થી પાણી સંબંધી વર્તમાન વાસ્તવિકતા રજૂ કરી હતી.

ખારા અને પ્રદુષિત પાણીને સ્વચ્છ કરવાની ટેકનિક વિકસાવવાની જરૂર

પ્રોફેસર પ્રદિપે વધુમાં કહ્યું કે, 'આપણી પાસે પાણી વિપુલ પ્રમાણમાં છે પણ તે ખારુ છે. આ ખારા પાણીને પીવા લાયક બનાવવા માટે સસ્તી અને સારી પ્યોરિફિકેશન પદ્ધતિ વિકસાવવાની જરૂર છે. જેના પર હાલ વિશ્વના દેશો રિસર્ચ કરી રહ્યા છે. વળી ઈન્ડસ્ટ્રીઝમાં યુઝ બાદ વેસ્ટ વોટર તરીકે બહાર નિકળતા પ્રદુષિત પાણીને પણ રિસાઈકલ કરીને કેવી રીતે પીવાલાયક બનાવી શકાય તે પણ આવનારા સમયમાં પડકાર રૂપ પ્રશ્ન બનીને સામે આવશે.'

Date: 8th June 2017
Publication: The Better India
Edition: Online
Journalist: (Authored article by Aditya Lolla & Priya Mohan)
Professor: Prof. Bhaskar Ramamurthi & Prof. Ashok Jhunjhunwala
Headline: TBI Blogs: How an IIT Madras Initiative Is Powering 9,000 Homes at a Fraction of Traditional Electricity Costs
URL: http://www.thebetterindia.com/103887/solar-dc-iit-madras-off-grid-electricity/

TBI Blogs: How an IIT Madras Initiative Is Powering 9,000 Homes at a Fraction of Traditional Electricity Costs

In today's India, there is an interesting dichotomy. Urban dwellers tend to take electricity for granted despite chronic load shedding, while at the same time, for the approximately 300 million Indians living off-grid, mere access to power is more of a privilege. As such, uninterrupted, reliable power still remains a distant reality in many parts of the country.

In villages like Bhoomji ka Gaon in Rajasthan, or Belagavadi in Karnataka, life comes to a standstill after sunset. These villages, like many others in India, lack either access to electricity, or high-quality, round-the-clock supply of electricity. Without electricity, villagers generally struggle with their evening chores under the dim light of aged kerosene lamps. Even during the daytime, these people are denied the most basic conveniences of modern life, like fans to fight the oppressive heat and mosquitoes, charging mobile phones and laptops, and lights in dimly lit areas to ward off snakes and insects.

A quick visit to such areas re-iterates the fact that electricity is not only about powering the homes, but about quality of life. These villages are victims of social ills, including poor security, particularly in the night, poor health, poor education, and lack of productivity opportunities, brought about due to lack of access to energy services

In 2015, the Council for Energy, Environment and Water had conducted a study of villages in six Indian states. A vast majority of these villages reported having fewer than four hours of electricity per day. Nearly half of the households reported having a grid connection but with effectively no electricity. Chief among the reasons that were cited were poor reliability, quality, and affordability.

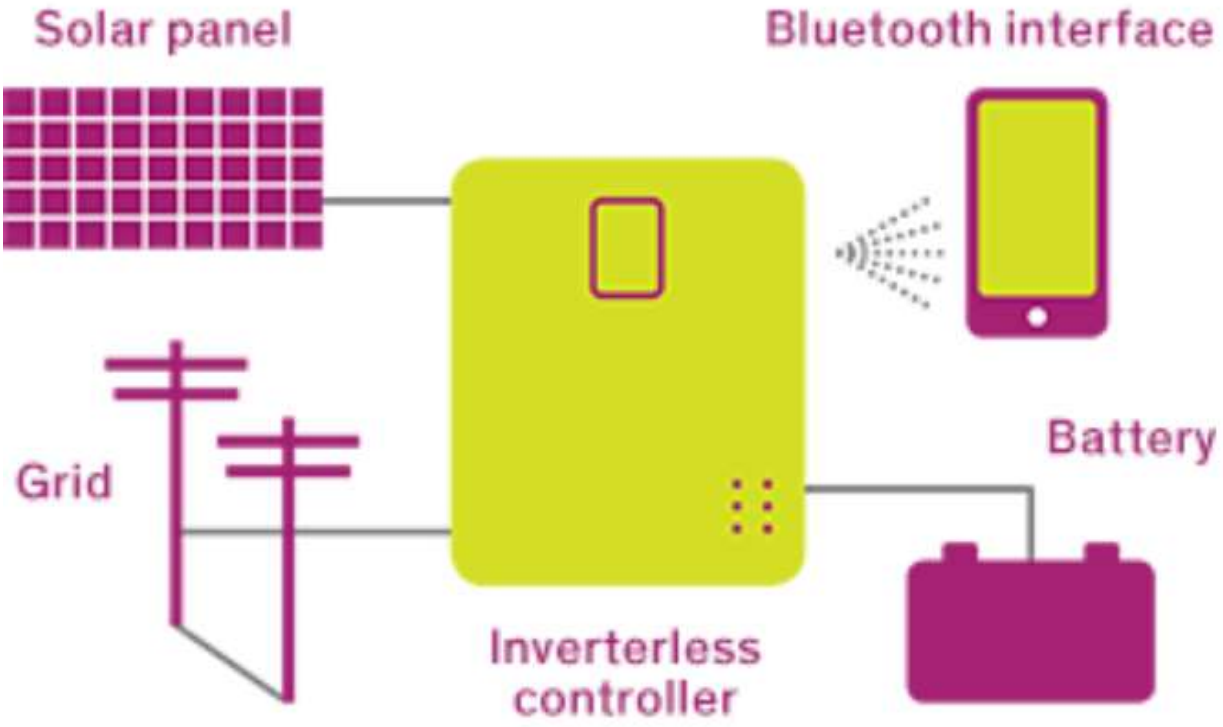
In many parts of the country, even middle-income households still find themselves held hostage to frequent power cuts that can last anywhere from a few hours a day to most of the day.

In an attempt to address this issue of energy poverty and make uninterrupted power accessible to all, the Solar DC team from the Indian Institute of Technology (IIT) Madras, spearheaded by Prof. Ashok Jhunjhunwala, in conjunction with industrial partners, began work on solar-powered direct-current (DC) micro-grids.

The idea is very simple. Have an internal distribution line with DC appliances running on DC power, and utilize solar panels and batteries which are inherently DC. Since this marries the energy-efficient DC technology with solar power solution, the size of the system falls drastically. This translates to energy and cost savings of about 50 % compared to conventional solar power solutions available today.

For homes not connected to the grid, a 125-watt micro-grid with a solar panel backed up by a small battery can supply all the electricity. For connected households, the micro-grid acts as a backup power supply to let lighting, fans, TV sets, and cellphone chargers continue operating even during brownouts.

Solar DC power generation is a disruptive concept which challenges the current business model of generation and distribution.



Solar DC Inverterless technology solution is the need of the hour, which proposes a new market architecture where the concepts of generating at point-of-use, minimal transmission costs, and storing electricity for later consumption are redefined and instigated.

The largest Solar DC Inverterless deployment to date involves 71 villages in Rajasthan, where the team has been working with the utility company Jodhpur Vidyut Vitaran Nigam Limited (JVVNL), the Rural Electrification Corporation, India, and the Ministry of Power to electrify 4,000 off-grid homes.

This project has proven to be a game-changer for JVVNL, as for the conventional power grid to reach these remote villages, it would require building substations and power lines, a difficult and economically unfeasible proposition given the uneven terrain, long distances, and occasional sere sandstorms. Details of many other Solar DC Inverterless installations could be found online.

A typical Solar DC Inverterless system comes with a 125-W solar panel, a specially designed 1-kWh lead-acid battery with an expected life span of 1,600 cycles (compared to about 800 cycles for a normal battery), and an Inverterless controller box. This would be enough to power a full-size DC fan, a dimmable LED tube light, an LED lightbulb, and a cellphone charger. The homeowner can add extra lights or a TV set, as long as the overall system sizing is done appropriately.

The entire system’s manufacture and installation costs a fraction of traditional grid electrification.

A grid-connected home where power is unreliable can benefit from having a separate DC line, which provides about 10 % of the usual household load during brownouts.

For villages like Bhoomji ka Gaon and Belagavadi, conventional electrification is many years away, at best. In the meantime, DC appliances will keep getting better. A wider range of products will come to market, including evaporative coolers, small DC refrigerators, and solar stoves. Solar panels, batteries, and other micro-grid components will continue to become cheaper and more efficient. In the end, the villagers may find that their off-grid systems providing all that they need.

These small interventions have gone ahead to prove that technology is definitely an enabler in transforming the quality of life. A modest level of access to electricity has shown to have positively impacted the lives of several thousands. They now enjoy comforts, conveniences, and security that they never thought they'd have. Technological breakthroughs can bring about change by making cities and villages livable, equitable, and sustainable.

IIT Madras has also been encouraging startups in the renewable energy and cleantech domain under the aegis of Prof. Bhaskar Ramamurthi and Prof. Ashok Jhunjhunwala.

Manufacturing of standard solar components is a small part of a larger emerging industry. Inverterless, application monitoring software, storage systems, domestic and commercial building energy management systems, and smart meters are some of the areas that startups like Cygni Energy, Chakra Networks, Swadha Energy, and Zazen Systems, among others, are working on.

Just as electricity transformed many industries roughly 100 years ago, Solar DC will also now change nearly every major industry. Better healthcare, transportation, entertainment, and manufacturing will enrich the lives of countless people.

About the authors: Aditya Lolla works as a Project Officer at the Center for Decentralized Power Systems. He is in charge of planning and delivery of various Solar DC projects. Priya Mohan is a Senior Incubation Associate & Communications Manager at the IITM Incubation Cell and is involved in facilitating start-up ecosystems, supporting various start-ups with their business challenges.

Date: 8th June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 9
Journalist: Manash Gohain
Professor: Prof. V Sundar
Headline: IIT Madras team helps reclaim 50 km of lost beaches in Kerala

IIT-Madras team helps reclaim 50km of lost beaches in Kerala

Applies Modern Technology To Age-Old Groin Fields Process

Manash.Gohain
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CONSERVING BEACHES: According to Prof V Sundar of department ocean engineering in IIT-M, who headed the project, a team from the department worked around Groin Fields, a technology which was last used in 1960s in India, and stopped erosion in around 25 coastal villages

New Delhi: Since 2007, IIT-Madras has reclaimed around 50km of lost beaches on Kerala's coastline by applying modern scientific technology to age-old 'Groin Fields' process. Through the project, implemented following a request from the Kerala government to check erosion, 25 eroded sites of two km each around 25 villages were reclaimed.

According to Prof V Sundar of department ocean engineering in IIT-M, who headed the project, a team from the department worked around Groin Fields, a technology which was last used in 1960s in India, and stopped erosion in around 25 coastal villages.

"After the tsunami, the Kerala government wanted a master plan for 25 villages to check erosion on stretches of two km in each. After investigation, we proposed 'Groin Fields' which yielded positive results. It has succeeded in retaining sand and building of the beaches. Thus, we reclaimed the lost beaches," said Sundar.

Groin Field as one of the coastal protection measures had been tried successfully all over the world. It was used in India in 1960s and was "completely forgotten". It was not a new idea from IIT-M, but the department "carefully designed with scientific process" to make a difference, said Sundar. Through this innovation, erosion activities didn't shift to nearby areas as feared earlier. Groin Field is a long, narrow structure built out into the water from a beach to prevent erosion.

What makes the concept of 'Groin Fields' unique is that it can actually recover land lost to the sea, unlike sea walls which can only prevent further erosion. However, Groin Fields require very precise calculations like quantity of sediments and direction of longshore currents.

The team is currently implementing a 'Groin Field' technology project in North Chennai, south of Pulicat backwaters where a beach of the width of about 300 metres over a stretch of 3km has been lost due to erosion. The first phase is to be completed in around a week's time.

"IIT-Madras formulated a comprehensive shoreline management plan that was submitted to the Tamil Nadu government in 2015-16, suggesting solutions to coastal problems. Consequently, the IIT-M team is currently implementing a Groin Field Project in North Chennai," said Sundar.

On the eve of the World Ocean Day, the head of the project said just because India has a long coastline there is no place for complacency as there is an urgent need to conserve beaches and their socio-economic aspects. "Conserving the coastline has national and global implications," said Sundar.

The IIT-M team has also undertaken 'river mouth training' as a solution to choking of river mouths so that it flows freely into the sea. "A critical phenomenon observed at places like Kozhikode and Ettikkulam among others along the Kerala coast is the choking of river mouths due to longshore drifts. Construction of training walls, at the mouth of the river, ensured that the river will drain freely into the sea," he said.

Date: 8th June 2017
Publication: QS Wow News
Edition: Newsletter
Page no.: 48
Journalist: NA
Headline: Indian Institute of Technology Madras wins 2017 IEEE Spectrum Technology in the Service of Society Award

Indian Institute of Technology Madras wins 2017 IEEE Spectrum Technology in the Service of Society Award

Solar panel installed at a village in India

India – The IEEE Spectrum Technology in the Service of Society Award is presented to the company/institution voted by IEEE Spectrum editors as having developed the technology having the greatest potential to provide the most overall benefit to humankind. In 2017, the editors have chosen to give this award to the Indian Institute of Technology Madras for the development of solar DC microgrid technology.

IEEE is the world's largest technical professional association, and produces over 30% of the world's literature in the electrical and electronics engineering and computer science fields. IEEE Spectrum is its flagship publication.

With the maturing of electronic technology, electrically powered home and office appliances are becoming far more energy efficient, by using only direct current (DC). To power them using existing AC power lines, each such device needs an AC-to-DC converter which adds to the losses, cost and unreliability. Center for Decentralized Power Systems (CDPS) at IIT Madras took the bold step of conversion of in-home power distribution from 230V AC to 48V DC, so as to directly power DC appliances and directly tap roof-top solar power. It resulted into a most energy-efficient solution for homes and offices.

India is fortunate to be blessed with good solar availability, making the sun a promising renewable energy resource. Roof-top solar photovoltaics, when directly used to power a DC line, offer the lowest-cost decentralised source of electricity to supplement power from the grid. With the addition of modestly sized batteries, the system promises energy delivery even during load shedding and long power outages. Solar-DC is also a viable and cost-effective solution for powering homes in remote off-grid areas, due to its reliability, affordability and its operation without dependency on grid.

The Solar-DC Inverterless system, consisting of DC solar generation, the DC power-line, DC appliances and battery, is a landmark innovation with the potential to be rapidly deployed in every home and office in India as well as in homes across the world. It will transform the lives of ordinary citizens by providing them reliable power supply, energy-efficient appliances and lower cost of electricity all at the same time.

The system has already been deployed in 4,000 off-grid homes in the districts of Jodhpur and Jaisalmer in Rajasthan, and is being deployed in 7,200 homes in several districts of Assam. It has also been deployed in Belagavadi in Karnataka, Alandur (Trichy) in Tamil Nadu and some villages in Orissa, Andhra Pradesh and Telengana, besides being deployed in several buildings on the IIT campus.

Date: 9th June 2017
Publication: The Times of India
Edition: Kochi
Page no.: 7
Journalist: Manash Pratim Gohain
Professor: Prof V Sundar
Headline: IIT-Madras team helps reclaim 50km of lost beaches in Kerala
URL: http://timesofindia.indiatimes.com/city/delhi/iit-madras-team-helps-reclaim-50km-of-lost-beaches-in-kerala/articleshow/59060778.cms

IIT-Madras team helps reclaim 50km of lost beaches in Kerala

Applies Modern Technology To Age-Old Groin Fields Process

Manash.Gohain@timesgroup.com

New Delhi: Since 2007, IIT-Madras has reclaimed around 50km of lost beaches on Kerala's coastline by applying modern scientific technology to age-old 'Groin Fields' process. Through the project, implemented following a request from the Kerala government to check erosion, 25 eroded sites of two km each around 25 villages were reclaimed.

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"IIT-Madras formulated a comprehensive shoreline management plan that was submitted to the Tamil Nadu government in 2015-16, suggesting solutions to coastal problems. Consequently, the IIT-M team is currently implementing a Groin Field Project in North Chennai," said Sundar.

On the eve of the World Ocean Day, the head of the project said just because India has a long coastline there is no place for complacency as there is an urgent need to conserve beaches and their socio-economic aspects. "Conserving the coastline has national and global implications," said Sundar. The IIT-M team has also undertaken 'river mouth training' as a solution to choking of river mouths so that it flows freely into the sea. "A critical phenomenon observed in places like Kozhikode and Ettikkulam among others along the Kerala coast is the choking of river mouths due to longshore drifts. Construction of training walls, at the mouth of the river, ensured that the river will drain freely into the sea," he said.

SAVING THE COASTLINE

- The state government had approached IIT-Madras for a solution after it was found that several coastal villages, spanning nine districts, were under coastal erosion threat
- Puthuvypeen, Paravur, Edavankad, Chennavelli, Vallazhrekal, Chavara, Pallipattumuri, Pallana, Perumpally were found to be eroding at a rate of 5-10 metres per year
- Groin fields and sea walls, which interrupt water flow and limit the movement of sediment, were constructed in a phased manner
- Around 15 to 20m of the coastline recovered along specified sites
- IIT is also constructing a groin field, extending over a distance of 1.4 km, near Nettukuppam (North Chennai)

Aerial view of the groin being constructed at Eanore. Groins are usually constructed perpendicular to the shore. These are either permeable or impermeable, submerged or piercing the free surface

Date: 9th June 2017
Publication: Western Times
Edition: Ahmedabad
Page no.: 3
Journalist: NA
Professor: Prof. T Pradeep
Headline: Unsustainable use in farming depleting groundwater

Unsustainable use in farming depleting groundwater

Ahmedabad, Professor of Indian Institute of Technology, Madras (IIT-Madras), T Pradeep, known for inventing water purifiers that provide drinking water for Rs 130 a year for a family, delivered a talk at Indian Institute of Technology-Gandhinagar (IITGn) on Tuesday. He said that use of groundwater in an unsustainable manner for farming is leading to its depletion.

Pradeep made his observations in his talk, "Clean Water Using Advanced Materials, Science, Incubation and Industry" delivered for an annual public lecture series, "Roddam Narasimha Distinguished Lecture", at IIT-Gn. Set up in 2012, the lecture series brings various professionals to the institute to present their works in areas of national importance. During the talk, Pradeep shared glimpses of global issues related to accessibility of clean and affordable drinking water. He said that though being scarce, potable water is being used in mindless ways.

"It is ridiculous that the groundwater is pumped up extensively and used for farming in an unsustainable fashion," said Pradeep, adding, "If efficient methods of water purification are developed, then the issue of groundwater depletion will be addressed effectively," he said.

The chemistry professor and his team of students have developed affordable neno-composites which can filter microbes and toxic components such as arsenic, lead and other contaminants to provide clean and safe drinking water. The nano-composites which look like and behave like sand, filters the water as it passes through, without requiring electricity. Pradeep, who has recently co-founded a company for research and manufacturing in clean water technology said, "We have implemented purification systems for several arsenic affected parts of India. In the next 12 months, we are expected to provide arsenic-free water to 10,00,000 people."

Pradeep has authored over 380 scientific papers and more than 75 patients and patent applications. His arsenic removal technology has reached about 600,000 people so far.

Date: 10th June 2017
Publication: India Times
Edition: Online
Journalist: Manash Gohain
Professor: Prof V Sundar
Headline: Here's How IIT-Madras Team Helped In Reclaiming 50 km Of Lost Beaches In Kerala
URL: http://www.indiatimes.com/news/india/here-s-how-iit-madras-team-helped-in-reclaiming-50-km-of-lost-beaches-in-kerala-323468.html

Here's How IIT-Madras Team Helped In Reclaiming 50 km Of Lost Beaches In Kerala

Since 2007, IIT-Madras has reclaimed around 50km of lost beaches on Kerala's coastline by applying modern scientific technology to age-old 'Groin Fields' process.

Through the project, implemented following a request from the Kerala government to check erosion, 25 eroded sites of two km each around 25 villages were reclaimed.

According to Prof V Sundar of department ocean engineering in IIT-M, who headed the project, a team from the department worked around Groin Fields, a technology which was last used in 1960s in India, and stopped erosion in around 25 coastal villages.

"After the tsunami, the Kerala government wanted a master plan for 25 villages to check erosion on stretches of two km in each. After investigation, we proposed 'Groin Fields' which yielded positive results. It has succeeded in retaining sand and building of the beaches. Thus, we reclaimed the lost beaches," said Sundar.

Groin Field as one of the coastal protection measures had been tried successfully all over the world. It was used in India in 1960s and was "completely forgotten".

It was not a new idea from IIT-M, but the department "carefully designed with scientific process" to make a difference, said Sundar. Through this innovation, erosion activities didn't shift to nearby areas as feared earlier. Groin Field is a long, narrow structure built out into the water from a beach to prevent erosion. What makes the concept of 'Groin Fields' unique is that it can actually recover land lost to the sea, unlike sea walls which can only prevent further erosion. However, Groin Fields require very precise calculations like quantity of sediments and direction of long-shore currents.

The team is currently implementing a 'Groin Field' technology project in North Chennai, south of Pulicat backwaters where a beach of the width of about 300 metres over a stretch of 3 km has been lost due to erosion. The first phase is to be completed in around a week's time.

"IIT-Madras formulated a comprehensive shoreline management plan that was submitted to the Tamil Nadu government in 2015-16, suggesting solutions to coastal problems. Consequently, the IIT-M team is currently implementing a Groin Field Project in North Chennai," said Sundar.

On the eve of the World Ocean Day, the head of the project said just because India has a long coastline there is no place for complacency as there is an urgent need to conserve beaches and their socio-economic aspects. "Conserving the coastline has national and global implications," said Sundar.

The IIT-M team has also undertaken 'river mouth training' as a solution to choking of river mouths so that it flows freely into the sea. "A critical phenomenon observed at places like Kozhikode and Ettikkulam among others along the Kerala coast is the choking of river mouths due to longshore drifts. Construction of training walls, at the mouth of the river, ensured that the river will drain freely into the sea," he said.

Date: 10th June 2017
Publication: News Bytes
Edition: Online
Journalist: NA
Professor: Prof V Sundar
Headline: IIT-Madras uses 'groins' to recover Kerala's lost beaches
URL: https://www.newsbytesapp.com/timeline/India/7764/45172/iit-madras-uses-groins-to-recover-kerala-s-lost-beaches

IIT-Madras uses 'groins' to recover Kerala's lost beaches

Since 2007, IIT-Madras has helped reclaim about 50km of Kerala's lost beaches - 25 eroded sites of 2kms each in 25 villages.

The initiative came after the Kerala government reached out to the institute 10 years ago for a master plan for the purpose.

IIT then reintroduced the age-old 'groins', a coastal protection measure, with modern modifications.

Groin
What's the technology about?
According to Wikipedia, a groin/groyne is a "rigid hydraulic structure built from the shore that interrupts water flow and limits the movement of sediment".

What makes it different is it can also help recover lost land.

In India, they were last seen in the 1960s and then "completely forgotten".

Then the ocean engineering department of IIT-M redesigned it "with scientific process".

Future
Model being replicated in North Chennai
The team, led by Prof V Sundar, is now replicating the model in North Chennai, south of Pulicat backwaters. About 300m of the beach is already lost.

The first phase will be completed in another week. The plan was submitted in 2015-16.

The team is also involved in checking choking of river mouths. Sundar says it is happening in places including Kozhikode and Ettikulam.

Date: 10th June 2017
Publication: Inuth
Edition: Online
Journalist: NA
Professor: Prof V Sundar
Headline: Splendid effort by IIT Madras helps rescue lost beaches in Kerala. Here is how
URL:http://www.inuth.com/india/splendid-effort-by-iit-madras-helps-rescue-lost-beaches-in-kerala-here-is-how/

Splendid effort by IIT Madras helps rescue lost beaches in Kerala. Here is how

India saw an unprecedented scale of devastation after 2004 Tsunami. Nearly 23,000 people died and lakhs were wounded and rendered homeless. Many villages in the coastal area got submerged in the water and some witnessed large scale erosion. Alarmed over the gradual erosion in coastal villages, Kerala government in 2007 requested IIT-Madras to devise a way to reclaim its eroding coastlines. The IIT team headed by Prof V Sundar of department ocean engineering has succeeded in reclaiming nearly 50km of lost beaches on Kerala's coastline by applying modern scientific technology to age-old 'Groin Fields' process. So far, 25 eroded sites of two km each around 25 villages have been reclaimed.

"After the tsunami, the Kerala government wanted a master plan for 25 villages to check erosion on stretches of two km in each. After investigation, we proposed 'Groin Fields' which yielded positive results. It has succeeded in retaining sand and building of the beaches. Thus, we reclaimed the lost beaches," Sundar told Times of India. Groin field has been a tried and tested measure used across the world to prevent coastal erosion. It was used in India in 1960s and was "completely forgotten".

Groin Field is a long, narrow structure built out into the water from a beach to prevent erosion. What makes this method a stand out is that it can actually recover land lost to the sea, unlike sea walls which can only prevent further erosion. This method require very precise calculations like quantity of sediments and direction of long-shore currents, reports Times of India.

The IIT team is using the same concept in North Chennai, south of Pulicat backwaters where a beach of the width of about 300 metres over a stretch of 3 km has been lost due to erosion.

Date: 14th June 2017
Publication: The Hindu
Edition: Delhi/Mumbai/Bangalore/Chennai/Kolkata/Kochi
Page no.: 9
Journalist: Shubashree Desikan
Headline: Detecting possibilities
URL: http://www.thehindu.com/opinion/op-ed/detecting-possibilities/article19032955.ece

SINGLE FILE

Detecting possibilities

The LIGO-India project will lead to the emergence of new research areas

SHUBASHREE DESIKAN

LIGO

U.S.-based Laser Interferometer Gravitational Wave Observatory (LIGO)'s detectors have picked up signals of yet another merger of two black holes that are three billion light years away and have masses equal to 31 and 19 times the mass of the sun.

With this discovery emerges not only a pattern among black holes but also possibilities of gravitational wave astronomy, detection of new heavenly bodies and gaining a better understanding of that most elusive of theories – Einstein's general theory of relativity, and the fundamental force of gravitation.

Contribution of Indians

Indians have made a significant contribution to this, with nearly 67 Indians from 13 institutions across the country taking part in the theory and experiment: CMI, Chennai; ICTS-TIFR, Bengaluru; IUCAA, Pune; and IISER Kolkata, to name just a few.

The jubilation over their participation is, however, tempered by the fact that the two existing detectors are not sufficient to locate exactly where in the sky the signals are coming from. With the Italy-based VIRGO detector set to join operations soon, this issue will be addressed. However, there will still remain some blind spots which can be overcome if the LIGO-India project enters the fray, as planned, in 2024.

Amidst such anticipation, it is necessary to take stock of the challenges ahead in building up this fourth player in the gravitational wave-detection game. There will be many firsts for India. Its experimental requirements will spearhead the evolution of many new research areas. Work on some of them has already begun in many centres: like the study of squeezed light in IIT-Delhi and IIT-Madras; mirror surface physics, in Saha Institute of Nuclear Physics, Kolkata, and TIFR, Hyderabad; and fibre-based laser technology in IIT-Madras.

Multiple constituents

On the theoretical side, too, there are major developments in store. The challenge will be to nurture these and take them towards implementation. Second, unlike experiments that are built up from a small core team, LIGO-India will start off as a complex organism, the many constituents of which will evolve simultaneously in different parts of the country. Assembling the parts to form a mature scientific enterprise, a first for India, will be an enormous challenge. Lastly, the Department of Atomic Energy, which is the main funding body for all big scientific investments in India, will also, in an unprecedented manner, take up the responsibility of building up the experiment.

The detected black hole mergers may seem simple compared with the dynamics of this massive coming together of so many theoreticians and experimentalists. However, what holds promise is that the level of the challenge is well-matched by the experience, the number and the ability of the scientists involved.

Date: 15th June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 2
Journalist: Amrutha Varshinii
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri & S Sarath Kumar
Headline: New sensors to keep wild animals at bay
URL: http://timesofindia.indiatimes.com/city/chennai/new-sensors-to-keep-wild-animals-at-bay/articleshow/59153406.cms

New sensors to keep wild animals at bay

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Chennai: Man-animal conflicts are usually sparse within the urban sprawl. But, on the outskirts of the city the menace of wild animals is often seen along the boundaries between forests and neighbouring farmlands. Neerkundram in Kancheepuram district is one such locality. At night, acres of farmland turn into meandering grounds for wild animals like porcupines, wild boars, jackals and monkeys, leading to the crops incurring heavy damage. With this in mind, a rural research group from IIT-Madras (Rutag) has crafted a technology that can prevent such losses.

Two third year students — Ravi Khatri (engineering design) and S Sarath Kumar (metallurgical engineering) — have designed a low cost solution in the form of a sensor-embedded stick covering the perimeter of the entire field, forming an invisible boundary.

The device will be dug into the soil and, on picking up animal movement, will send out an alarm to drive it away. RuTag, the rural tech centre at IIT-M which has developed this tech, will be testing out a prototype at the institute campus shortly, before implementing it at Neerkundram by August this year. "Just one of the sensors can potentially cause a false alarm, which is where the second one comes into play. The passive IR (infra-red) sensor will detect body heat (temperature) of the animals along with movement, while the microwave sensor will send out a signal which will be reflected back in case an animal is moving around it," explains Abhijit P Deshpande, professor, department of chemical engineering and head of RuTag, who is overseeing the project implementation.

Explaining that nearly 40% of a field can be overrun and damaged by forest animals, Deshpande says that the technology can cut out human intervention or, in the worst case scenario, buy a farmer more time in the event of his crop being trespassed by a herd. During harvest time, the animals are drawn to the field due to the scent of the crops — be it paddy, vegetables or groundnut. "We will be consulting animal behavior experts to decide what kind of sound the device will produce. The idea is to only deter them, not affect them in any way," he said.

The present project will be trialed at the IIT campus to track deer movement, after which it will be implemented at the Neerkundram forest area boundaries where the farmlands lie. The cost of each sensor-embedded stick is projected to be only about a few hundred rupees.

It is also being carried out on a larger scale by PPG College, Coimbatore, to detect elephant movement in the Anaikatti belt. The project is also being funded by Rutag.

HOW IT WORKS

- **The device will be partially buried in the soil around the field,** forming an invisible boundary
- **The battery-operated device picks up temperature** and movement of animals at night using two sensors
- **First sensor detects an animal and the second verifies** it by bouncing the signal off the animal
- **Upon ascertaining, it emits an alarm** like sound to deter the animal and alert the farmer

Date: 17th June 2017
Publication: The Times of India
Edition: Chennai
Page no.: 7
Journalist: Amrutha Varshinii
Professor: Prof. Abhijit P Deshpande, Prof. Lakshman Neelakantan & Prof. Manav Mukherjee.
Headline: IIT Madras' 'synthetic clay' saves Bidri craftsmen from losing their trade
URL: http://timesofindia.indiatimes.com/city/chennai/iit-madras-synthetic-clay-saves-bidri-craftsmen-from-losing-their-trade/articleshow/59184942.cms

IIT Madras' 'synthetic clay' saves Bidri craftsmen from losing their trade

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Chennai: 'Bidriware', the craftsmanship unique to Bidar in Karnataka, is made from a special clay-sand drawn from the Bidar fort, from where it gets its name. After the Archaeological Survey of India (ASI) recently declared the Bidar fort a 'heritage site', the artisans nearly lost their trade. But thanks to a synthetic clay that has been cooking in the labs of IIT-Madras here, it appears the Bidri can shine on.

The prohibition on procuring sand from Bidar area matters, because the artisans have long held that this clay sand is what gives the Bidri metal (Zinc copper alloy) its distinct black-silver colour. This would mean the entire community of artisans dependent on bidri-crafting as a trade would vanish. So after an NGO 'Sahayog' approached IIT-M's Rural Technology Action Group (RuTag) with the problem, a research team has been researching how to reproduce a type of sand which when treated with the alloy can produce the same color. "While the traditional belief is that the fort area has a 'special' sand exclusive to the community in Bidar, we got down to understanding what the special component in this sand is. It has been found to be a nitrogenous compound," says Abhijit P Deshpande, head of RuTag and professor in the Chemical Engineering department.

A research team has been researching how to reproduce sand which when treated with the alloy can produce the same color

The traditional craftsmanship style involves the alloy being treated in the clay sand along with aluminium chloride after which the surface is coated with black patina (oxide) to get the black-silver sheen. Now, the process will be reproduced with the sand that has been treated by the lab process, which has cost the university about ₹2lakh in research. This has been done by the joint efforts of two assistant professors at the Department of Metallurgical and Materials engineering — Lakshman Neelakantan and Manav Mukherjee.

It is also being coordinated at a government level by the Office of Development Commissioner - Handicrafts Dharwad (Karnataka) and Sahayog, which works with the artisans.

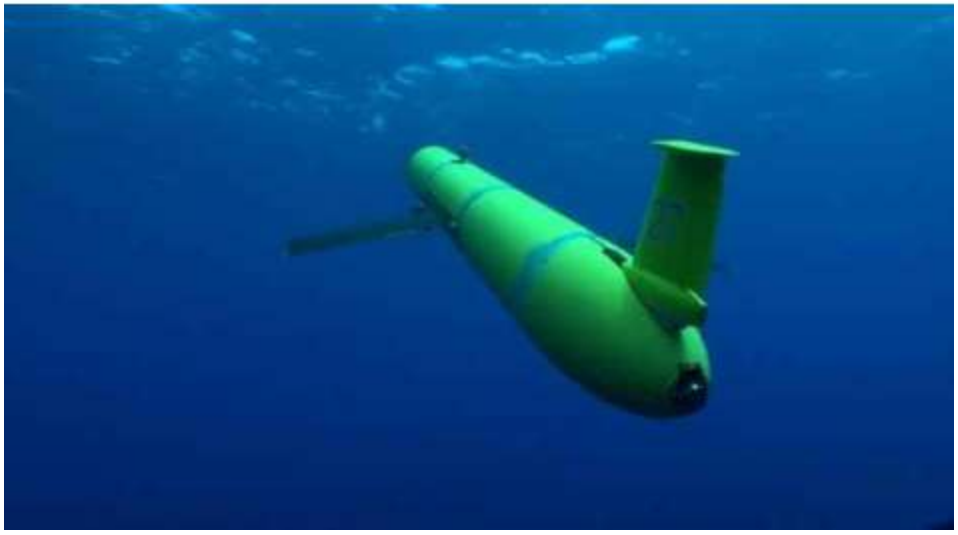
Date: 17 June 2017
Publication: Vikatan
Edition: Online
Journalist: G. Sudhakar
Professor: Prof. P. Krishnankutty
Alumni/PhD scholar: Naga Praveen
Headline: Surveillance, Research, Security...Drones That Rule the Deep Seas
URL: http://www.vikatan.com/news/miscellaneous/92450-operating-principle-and-features-of-underwater-drones.htm

கண்காணிப்பு, ஆராய்ச்சி, பாதுகாப்பு... ஆழ்கடலிலும் ஆதிக்கம் செலுத்தும் ட்ரோன்கள்!
#UnderwaterDrones

ட்ரோன்கள் என்றதுமே நம் நினைவு வானின் மீதுதான் இருக்கும். வானில் வட்டமடித்து மனிதர்களைக் கண்காணிக்கும், தீவிரவாதிகளின் மீது குண்டுமழை பொழியும் ட்ரோன்கள் பற்றிப் படித்திருப்பீர்கள். ஆனால் ஆழ்கடலின் அடியில் இயங்கும் ட்ரோன்களைப் பற்றி தெரியுமா? எப்படி வான்வெளி ட்ரோன்கள் பாதுகாப்பு, படப்பிடிப்பு, கண்காணிப்பு என மனிதர்களுக்கு உதவியாக இருக்கிறதோ அதைப்போலவே கடலின் அடிப்பரப்புகளை பற்றிப் படிப்பதற்கும், கடல் பகுதிகளைப் பாதுகாப்பதற்கும் பயன்படுபவை இந்த ஆழ்கடல் ட்ரோன்கள். பொதுவாக Unmanned Underwater Vehicles என அழைக்கப்படும் இந்த ட்ரோன்களில், தற்போது அடுத்த கட்ட ஆராய்ச்சிகளில் ஈடுபட்டுவருகிறது சென்னை ஐ.ஐ.டி.

இந்த ஆராய்ச்சியைப் பற்றி பார்ப்பதற்கு முன்னர் நாம் சில விஷயங்களைத் தெரிந்துகொள்ள வேண்டும். உதாரணமாக கடலில் இயங்கும் ஒரு நீர்மூழ்கிக்கப்பல்களை எடுத்துக்கொள்வோம். கப்பலில் இருக்கும் இன்ஜின் ஆனது, கப்பலில் இருக்கும் புரோப்பல்லர்களை (Propeller) இயக்கும். அந்த இன்ஜினுக்கான மின்சக்தி எரிபொருள்கள் மூலம் பெறப்படும். இப்படி இயங்கும் புரோப்பல்லர்கள் ஆனது, கப்பலுக்குத் தேவையான உந்துசக்தியை அளித்து கப்பலை இயக்கும். இதன் மூலம்தான் கப்பலின் இயக்கங்கள் நடைபெறும். ஆனால் கடலில் இருக்கும் உயிரினங்கள் எப்படி இடம்பெயர்கின்றன எனக் கொஞ்சம் யோசியுங்களேன். மீன் ஆனது தனது துடுப்புகள் மற்றும் வால் பகுதியை அசைப்பதன் மூலம் நகர்கிறது. பாம்புகளுக்கு துடுப்புகள் கிடையாது. அவை எப்படி நகர்கின்றன? தனது உடல் முழுவதையும் மேலும், கீழும் அசைப்பதன் மூலமாக நகர்கின்றன. சுறா மீன் மற்றொரு மாதிரியாக நீந்தும். இதேபோல பறவைகளை எடுத்துக்கொள்ளுங்கள். ஒவ்வொரு பறவையும் ஒவ்வொரு மாதிரியாக பறக்கும். மனிதன் தயாரித்த நீர்மூழ்கி கப்பல்களோடு ஒப்பிட்டால், இயற்கையின் இடப்பெயர்ச்சி முறைகள் ஒவ்வொன்றும் இப்படி வித்தியாசமானது.

இந்த முறைகளின் பின்னால் இருக்கும் அறிவியலைப் பயன்படுத்தி ஆழ்கடல் வாகனங்களை இயக்குவதற்கு Bio-Inspired Propulsion System எனப்பெயர். "பறவையைக் கண்டான்; விமானம் படைத்தான்" என்பது போல, கடல்வாழ் உயிரினங்களின் அசைவுகளைக் கண்காணித்து, அதன் தத்துவத்தின் அடிப்படையில் வாகனங்களை வடிவமைப்பதுதான் இந்த திட்டம். வருங்காலங்களில் உருவாக்கப்படும் ஆழ்கடல் ட்ரோன்கள் இப்படித்தான் உருவாக்கப்படும். இதுகுறித்த ஆராய்ச்சிகளைத்தான் சென்னை ஐ.ஐ.டி.யின் கடல்சார் பொறியியல் துறையைச் சேர்ந்த பேராசிரியர் கிருஷ்ணன்குட்டி மற்றும் அவரது மாணவர் நாக பிரவீன் பிரபு ஆகிய இருவரும் மேற்கொண்டு வருகின்றனர். தற்போது இருக்கும் புரொபல்சன் சிஸ்டம் மற்றும் பயோ இன்ஸ்பையர்ட் புரொபல்சன் சிஸ்டம் ஆகிய இரண்டிற்கும் இடையேயான வேறுபாடுகளை விளக்கினார் நாக பிரவீன் பிரபு.



"ஆளில்லா ஆழ்கடல் வாகனங்கள் உலகம் முழுவதுமே பல்வேறு விஷயங்களுக்காகப் பயன்படுத்தப்பட்டு வருகின்றன. இவற்றை ட்ரோன்கள் என்றும் அழைக்கலாம். சீனா, அமெரிக்கா, ரஷ்யா போன்ற நாடுகள் இதுபோன்ற வாகனங்களை அதிகளவில் பயன்படுத்தி வருகின்றன. ஆனால் தற்போது பயன்படுத்தப்படும் வாகனங்களில் சில குறைபாடுகள் இருக்கின்றன. முதலாவது அதிகப்படியான எரிபொருள் செலவு. வாகனங்களின் இன்ஜின்கள் அதிகப்படியான சக்தியை வெளியிட வேண்டியிருப்பதால் அதிகமாக எரிபொருள்கள் செலவாகும். மேலும் சுற்றுச்சூழலும் மாசடையும். அத்துடன் கடலுக்கடியில் நீண்ட நாள்கள் இருக்க முடியாமல், அடிக்கடி எரிபொருள்களை நிரப்ப, வாகனங்கள் மேல்பகுதிக்கு வரவேண்டிய அவசியமும் ஏற்படும்.

இரண்டாவது இந்த வாகனங்களின் அதிர்வுகள் மற்றும் இரைச்சல். இவை ஏற்படுத்தும் அதிர்வுகள் கடலில் இருக்கும் பல்லுயிர் தன்மைக்கு இடைஞ்சலாக இருக்கும். மேலும், இரைச்சல் உண்டாவதால் எளிதில் எதிரிகள் நம் வாகனங்களை அடையாளம் கண்டுகொள்ள முடியும். அதேபோல இந்த வாகனங்கள் நீருக்குள்ளே செல்லும்போது, மேல்பரப்பில் நீரலைகள் உண்டாகும். இதை வைத்துக்கொண்டே ரேடார் மூலம், கடலுக்கு அடியில் இருக்கும் வாகனம் எப்படிப்பட்டது என்பதைக் கண்டறிய முடியும். அடுத்தது வாகனங்களை திருப்புவதில் இருக்கும் சிக்கல். உதாரணமாக ஒரு கப்பலை உடனே திருப்ப வேண்டுமென்றால், தரையில் திருப்புவது போல உடனே திருப்பிவிட முடியாது. சிறிதுதூரம் சென்றுதான் திரும்பும். கப்பலை நிறுத்துவதும் இப்படிதான். ஆனால் இயற்கையான முறையில் இந்த வாகனங்களை உந்த செய்வதன் மூலமாக, விரைவாக திருப்பவும் நிறுத்தவும் கூட நம்மால் முடியும்.

அதேபோல இந்த இயற்கையான புரொபல்சன் சிஸ்டம் மூலம் எரிபொருள்களை நம்மால் பெருமளவு குறைக்க முடியும். இதில் சாதாரண வாகனங்களை விடவும் 65% அதிகமான திறனைப் பெற முடியும். எரிபொருளின் நுகர்வு குறைந்தால், சுற்றுச்சூழல் மாசுபாடும் குறையும். இந்த ட்ரோன்கள் சத்தமின்றி, அதிக அதிர்வுகளின்றி இயங்குவதால் கடலின் பல்லுயிர்தன்மைக்கும் எவ்வித அச்சுறுத்தல்களும் இருக்காது. இயற்கையான இடப்பெயர்ச்சி முறைகளில் நிறைய வகைகள் இருக்கின்றன. அவற்றில் மீனின் அசைவை மட்டும் அடிப்படையாகக் கொண்டு எங்கள் சோதனைகளைச் செய்துவருகிறோம். மீன்களைப் பொறுத்தவரை அதன் உடலில் துடுப்புகள் மற்றும் வால் ஆகிய இரு பகுதிகள் மட்டும்தான் இயங்கும். மற்ற பகுதிகள் அப்படியே இருக்கும். மீனின் இடப்பெயர்ச்சியில் வால்தான் சுமார் 80% அளவிற்கு பங்களிக்கிறது. இதையெல்லாம் வைத்துதான் எங்கள் சோதனை மாதிரிகளை உருவாக்கியிருக்கிறோம். இதுகுறித்த கணித ரீதியான ஆராய்ச்சிகளை பெங்களூருவில் இருக்கும், தேசிய அறிவியல் கழகம் மேற்கொண்டு வருகிறது.

செயல்பாடுகள் தொடர்பான ஆராய்ச்சிகளை சென்னை ஐ.ஐ.டி.,தான் இந்தியாவில் முதல்முறையாக மேற்கொண்டு வருகிறது.

வானில் பறக்கும் ட்ரோன்களுக்கும், கடலின் அடியில் இயங்கும் ட்ரோன்களுக்கும் இடையே உருவ அளவிலும், தொழில்நுட்ப ரீதியிலும் நிறைய வேறுபாடுகள் இருக்கின்றன. வானில் பறக்கும் ட்ரோன்களில் இறக்கைகள் மூலம் கீழிருந்து மேலே பறக்கிறது. இந்த ட்ரோன்கள் துடுப்புகள் மூலமாக நகர்கின்றன. அந்த ட்ரோன்களை வேகமாகக் கூட நம்மால் இயக்க முடியும். ஆனால் இந்த ட்ரோன்களை குறிப்பிட்ட அளவிலான வேகத்தில் மட்டும்தான் நம்மால் இயக்க முடியும்" என நிறுத்த, இந்த ஆளில்லா ஆழ்கடல் ட்ரோன்களின் பயன்பாடுகள் குறித்து பேராசிரியர் கிருஷ்ணன்குட்டி விளக்கத் துவங்கினார்.

பேராசிரியர் கிருஷ்ணன்குட்டி"நம் நாடு பெருமளவு கடலால் சூழப்பட்டுள்ளதால், கடலின் பாதுகாப்பு என்பது மிகவும் முக்கியம். ஆனால் மனிதனால் மட்டுமே கடலின் அனைத்துப் பகுதிகளையும் கண்காணிக்க முடியாது. அதுபோன்ற இடங்களில் கைகொடுப்பவைதான் இந்த ஆழ்கடல் ட்ரோன்கள். இதன் மூலம் ஆட்களை கடலுக்குள் அனுப்பாமலே, கடலினைப் பற்றி முழுமையாகத் தெரிந்துகொள்ள முடியும். கடலின் ஒவ்வொரு இடத்தையும் சென்சார்கள் மூலம் ஆராயவும் முடியும். ஆழ்கடல் ட்ரோன்கள் பெருமளவு ராணுவ கண்காணிப்பிற்காக மட்டுமே பயன்படுத்தப்படுகின்றன. அத்துடன் கடலின் வளங்களை ஆராய்தல், மீன் வளங்கள் குறித்த கண்காணிப்பு, கடலின் தாதுவளம் குறித்த விவரங்கள், பூமியின் நிலப்பரப்பு குறித்த தகவல்கள், கடலில் ஏற்படும் கப்பலின் எண்ணெய் கசிவுகள் போன்ற விவரங்களையும் பெற முடியும். இது அளவில் மிகவும் சிறியதாகவும், அதிர்வுகள் குறைவானதாகவும் இருக்கும். எனவே எதிரிகள் ரேடார் மூலமாக இதனைக் கண்டறிவது என்பதெல்லாம் கடினம். எப்படி ஏரியல் ட்ரோன்கள் வானில் இருந்து கண்காணிக்க உதவுகிறதோ, அதைப் போலவே ரகசியமாக கடல்பரப்பைக் கண்காணிக்க இவை அதிகளவில் உதவும். இந்த ட்ரோனை கடலுக்கு அடியில் அனுப்பிவிட்டு, அதனை ஏதேனும் ஒரு கட்டுப்பாட்டு மையத்தில் இருந்து கட்டுப்படுத்தவும், அதன்மூலம் தகவல்களைப் பெறவும் முடியும். செலவும் குறைவு. எனவே ஆழ்கடல் ஆராய்ச்சிகளுக்கும் வருங்காலங்களில் அதிக அளவில் உதவிசெய்யும்" என்றார்.

இந்த ட்ரோன்களின் வருங்காலம் பற்றிக் குறிப்பிட்ட பிரவீன், "தற்போது வானில் பறக்கும் ட்ரோன்கள் அல்லது நீருக்கடியில் பயணம் செய்யும் ட்ரோன்கள் என இருவகையாக இருக்கின்றன. ஆனால் எதிர்காலங்களில் ஒரே ட்ரோனை இரண்டு பரப்புகளிலும் இயக்கும்படி வடிவமைக்கப்படலாம். அதற்கான ஆய்வுகளும் தற்போது நடந்து வருகின்றன. நீங்கள் பறக்கும் மீன்களை நீங்கள் பார்த்திருக்கலாம். அதனால் நீருக்கடியில் விரைவாக நீந்தவும் முடியும். நீருக்கு வெளியே பறக்கவும் முடியும். எனவே அதன் செயல்பாடுகளை வைத்து இதுமாதிரியான ட்ரோன்கள் வடிவமைக்கப்படலாம்" என்றார்.

Date: 18th June 2017
Publication: Nanayam Vikatan
Edition: Chennai
Page no.: 30
Journalist: G. Sudhakar
Alumni/student: Lokesh Kumar
Headline: Astonishing technologies of tomorrow - 3D printing
URL: http://www.vikatan.com/nanayamvikatan/2017-jun-25/recent-news/132009-3d-printer-exciting-tactical-technology.html

ஜேம்ஸ் பாண்டின் ஆஸ்டின் கார்!

சேனா சரவணன்

கோவையில் கூட்டம்... கமாடிட்டியில் டிரேட் செய்ய ரூபாய் 300 போதுமே!

Date: 22nd June 2017
Publication: The Economic Times
Edition: Mumbai/Delhi/Bangalore/Hyderabad/Chennai/Ahmedabad
Page no.: 6
Journalist: Aritra Sarkhel
Professor: Prof. Hema A Murthy
Headline: How Hema Murthy taught your smartphone Indian languages
URL:http://economictimes.indiatimes.com/articleshow/59262962.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

How Hema Murthy Taught Your Smartphone Indic Languages

IIT-Madras professor's work on text-to-speech in Indian languages using an open source platform was adopted by mobile operating system Indus

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Bengaluru: If you are using an Indus OS-based smartphone in India, chances are that you will be able to convert text-to-speech (TTS) in a native Indian language with the click of a button. Although it sounds like a no-brainer, the process of converting text to any native Indian language is the result of 15 years and more than 30,000 hours of work by Dr Hema Murthy and Noida-based Indus OS.

While Professor Murthy was signing her coffee at the IIT-Madras campus and coding in the wee hours of the morning to make text-to-speech synthesis possible for 12 Indian languages, Rakesh Deshmukh, CEO, Indus OS was in the search of a similar speech platform which would further enhance the localised operating system.

Eventually, in 2015, Indus OS collaborated with the department of electronics and IT to work on Murthy's text-to-speech synthesis platform for native Indic languages. The partnership resulted in Indus Reader which is used in smartphones manufactured by Micromax, Celkon, Karbonn and Swipe among others.

But had Rakesh Deshmukh not met Swaran Lata, senior director of the Technology Development for Indian Languages (TDIL) Programme, Ministry of Electronics and Information Technology, Murthy's work would not have reached Indus-OS based mobile phones in India.

Murthy, a PhD in computer science and engineering from IIT-Madras, has always taken a keen interest in speech processing and synthesis, and this belief helped her develop TTS in Indian languages using an open source platform. "Considering the variety of Indian languages and how each language is different from one another, I thought why not have device or platforms which can translate English text-to-speech into any Indian language."

She says that due to the presence of L&H languages across India, it was difficult to build an individual TTS system for each language. But thanks to the common roots, she managed to develop a common framework. "The Indo-Aryan class of languages share certain distinct common features. A lot of speech sounds have been borrowed from each language. So, we developed a common phone set to work on," said Murthy.

But unfortunately, not many in India were aware of her research in the language paradigm. "Evolving a common technology development framework and adding language dependent requirements as modules was a big challenge. We also never really saw any major interest from a private organisation in India."

But things changed in 2008 when she was awarded the IBM IRL Faculty Award. This got her work recognition for the first time outside the community of professors.

The mother, Lata invited Murthy to lead the consortium on text to speech. The components of 13 Indian languages were integrated by speech and language teams from IIT-Kharagpur, IIIT-Hyderabad, IIT-Madras, C-DAC Mumbai and Thiruvananthapuram.

While she was working on further developments on the platform, Deshmukh met Lata, who told him about the existence of the project. "When I first met her in December 2015, I was surprised by the advancements in the text-to-speech algorithms. Such kind of development away from the myopic eye of the media was unheard of in India," said Deshmukh.

After singing the MoU on December 12, Indus OS made the necessary changes on the platform for Indian users.

DR HEMA MURTHY
Professor, IIT-Madras

The Indo-Aryan class of languages share certain distinct common features... So, we developed a common phone set to work on

Date: 23rd June 2017
Publication: The Economic Times
Edition: Pune
Page no.: 7
Journalist: Aritra Sarkhel
Professor: Prof. Hema A Murthy
Headline: How Hema Murthy taught your smartphone Indian languages
URL:http://economictimes.indiatimes.com/articleshow/59262962.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

How Hema Murthy Taught Your Smartphone Indic Languages

IIT-Madras professor's work on text-to-speech in Indian languages using an open source platform was adopted by mobile operating system Indus

Aritra Sarkhel
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Bengaluru: If you are using an Indus OS-based smartphone in India, chances are that you will be able to convert text-to-speech (TTS) in a native Indian language with the click of a button. Although it sounds like a no-brainer, the process of converting text to any native Indian language is the result of 15 years and more than 30,000 hours of work by Dr Hema Murthy and Noida-based Indus OS.

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Eventually, in 2015, Indus OS collaborated with the department of electronics and IT to work on Murthy's text-to-speech synthesis platform for native Indic languages. The partnership resulted in Indus Reader which is used in smartphones manufactured by Micromax, Celkon, Karbonn and Swipe among others.

But had Rakesh Deshmukh not met Swaran Lata, senior director of the Technology Development for Indian Languages (TDIL) Programme, Ministry of Electronics and Information Technology, Murthy's work would not have reached Indus-OS based mobile phones in India.

Murthy, a PhD in computer science and engineering from IIT-Madras, has always taken a keen interest in speech processing and synthesis, and this belief helped her develop TTS in Indian languages using an open source platform. "Considering the variety of Indian languages and how each language is different from one another, I thought why not have device or platforms which can translate English text-to-speech into any Indian language."

She says that due to the presence of L&H languages across India, it was difficult to build an individual TTS system for each language. But thanks to the common roots, she managed to develop a common framework. "The Indo-Aryan class of languages share certain distinct common features. A lot of speech sounds have been borrowed from each language. So, we developed a common phone set to work on," said Murthy.

But unfortunately, not many in India were aware of her research in the language paradigm. "Evolving a common technology development framework and adding language dependent requirements as modules was a big challenge. We also never really saw any major interest from a private organisation in India."

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Thereafter, Lata invited Murthy to lead the consortium on text to speech. The components of 13 Indian languages were integrated by speech and language teams from IIT-Kharagpur, IIIT-Hyderabad, IIT-Madras, C-DAC Mumbai and Thiruvananthapuram.

While she was working on further developments on the platform, Deshmukh met Lata, who told him about the existence of the project. "When I first met her in December 2015, I was surprised by the advancements in the text-to-speech algorithms. Such kind of development away from the myopic eye of the media was unheard of in India," said Deshmukh.

After singing the MoU on December 12, Indus OS made the necessary changes on the platform for Indian users.

DR HEMA MURTHY
Professor, IIT-Madras

The Indo-Aryan class of languages share certain distinct common features... So, we developed a common phone set to work on

Date: 23rd June 2017
Publication: Business Insider
Edition: Online
Journalist: NA
Professor: Prof. Hema Murthy
Headline: Meet Hema Murthy who is converting text to speech in Indian languages on your smartphone
URL: http://www.businessinsider.in/Meet-Hema-Murthy-who-is-converting-text-to-speech-in-Indian-languages-on-your-smartphone/articleshow/59266031.cms

Meet Hema Murthy who is converting text to speech in Indian languages on your smartphone

Next time when you convert text to speech in an Indian language on Indus OS based smartphone, don't forget to thanks Hema Murthy.

Meet Hema Murthy who made this conversion possible on a smartphone and this is a result of 15 years of hardwork.

Indus OS collaborated with Department of Electronics and IT in 2015 and worked with Murthy, who spent her mornings to make text to speech synthesis possible for 8 Indian languages.

ET reported Rakesh Deshmukh, CEO, Indus OS was in the search of a similar speech platform which would further enhance the localized operating system.

Their partnership resulted in a product called Indus Reader, which is used in smartphones manufactured by Micromax, Celkon, Karbonn and Swipe among others.

Professor Murthy, a PhD in Computer Science and Engineering from IIT Madras, has been interested in speech processing and synthesis and this belief helped her develop TTS in Indian languages using open source platform.

"Considering the vast variety of Indian languages and how each language is different from one another, I thought why not have devices or platforms which can translate English text to speech in any Indian language," she told ET.

"Indo-Aryan class of languages shares certain distinct common features. A lot of speech sounds have been borrowed from each language. So we developed a common phone set to work on," said Murthy.

But, majority of the people are not aware of the research.

After signing the MOU, Indus OS made the necessary changes on the platform for the Indian user. "Indus OS team has a long-term vision of taking Indian languages through the mobile platform in rural areas. This was really an opportunity to mass-proliferate the TDIL developed technologies," says Lata.

Date: 29th June 2017
Publication: Dainik Jagran
Edition: National
Page no.: 14
Journalist: Navneet Kumar Gupta
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri and S Sath
Headline: New sensor to save crops from wildlife

खोज

वन्य जीवों के हमले से फसलों को बचाएगा सेंसर

भारतीय शोधकर्ताओं द्वारा तैयार इस नए उपकरण का फायदा यह होगा कि इसके जरिये जानवरों की मौजूदगी की सूचना किसानों को मिल सकेगी। इससे वे सतर्क हो जाएंगे और अपनी फसलों को नष्ट होने से बचा सकेंगे।

नई दिल्ली, आइएसडब्यू : भारतीय शोधकर्ताओं ने फसलों को वन्यजीवों के हमलों से बचाने का नया उपकरण बनाया है। आइआइटी मद्रास के द रूरल टैक्नोलॉजी एक्शन ग्रुप फॉर तमिलनाडु के शोधकर्ताओं द्वारा तैयार यह संवेदी यंत्र खेत में जानवरों की मौजूदगी की सूचना देकर किसानों को सतर्क करता है। यंत्र में लगा अलार्म और लाइट खुद भी जानवरों को भगाने का काम करता है। यंत्र के प्रोटोटाइप का परीक्षण आइआइटी- मद्रास के परिसर में हिरणों की मौजूदगी जांचने के लिए किया जा रहा है। अगस्त में इसे चेन्नई के कुर्नलम क्षेत्र में इसे लगाया जाएगा।

आइआइटी मद्रास के छात्र रवि खत्री और एस. सरथ द्वारा तैयार इस यंत्र में पैसिव इंफ्रा रेड और माइक्रोवेव सेंसर लगाए गए हैं। पैसिव इंफ्रा-रेड जानवर के शरीर के तापमान से प्रभावित होता है और माइक्रोवेव जानवर की मौजूदगी को आसानी से भांप लेता है। अलार्म व लाइट वाले इस उपकरण को खेत में दस मीटर की दूरी पर लगाया जाता है। जैसे ही कोई जानवर करीब आता है तो सेंसर उसकी उपस्थिति को भांप लेते हैं। उपकरण में लगी लाइट जलने लगती है एवं अलार्म बजने लगता है। अलार्म की आवाज और लाइट को देखकर जानवर दूर भाग जाते हैं। किसान को भी पता चल जाता है कि उनके खेत में कोई जानवर घुस आया है।

आइआइटी मद्रास के छात्रों ने बनाया नया संवेदी उपकरण

अलार्म की आवाज और रोशनी से जानवरों को दूर भी भगाएगा

ग्रामीण प्रौद्योगिकी केंद्र के प्रोफेसर अभिजीत पी. देशपांडे के अनुसार, 'यह उपकरण इस प्रकार विकसित किया गया है कि एक फसल लेने के बाद जब खेत खाली हो तो इसे आसानी से निकालकर रखा जा सके।' अभी इस उपकरण को बैटरी से चलाया जाता है, लेकिन भविष्य में इसे सौर ऊर्जा से चलाने की संभावना को तलाशा जा रहा है। देशपांडे ने कहा, खेत में उपकरण लगाने में लगभग दो हजार रुपये की लागत आती है। ज्ञात हो, देश के विभिन्न हिस्सों में हाथी, नीलगाय और जंगली सुअर जैसे वन्यजीव अक्सर अपने आवास स्थलों से निकलकर खेत-खलिहानों तक आ जाते हैं। फसलों को नुकसान पहुंचाने के अलावा कई बार इन जीवों का इंसानों से टकराव भी हो जाता है।

तेंदुआ, बाघ और भेड़िए जैसे मांसाहारी जीव पालतू पशुओं के साथ-साथ कई बार वन्य जीव इंसानों को भी अपना शिकार बना लेते हैं। इस समस्या से निपटने के लिए परंपरागत तकनीकों को सहारा लिया जाता है। कहीं पर मिर्च जलाकर जानवरों को दूर भगाने की कोशिश की जाती है, तो कभी उन पर हमला कर दिया जाता है। कभी-कभार आग से भी इन जानवरों को डराया जाता है। लेकिन, समस्या जस की तस बनी हुई है।

Date: 30th June 2017
Publication: APN Live
Edition: Online
Journalist: NA
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri and S Sath
Headline: New sensor made by IIT students to save crops from wildlife
URL: http://hindi.apnlive.com/india-news/new-sensor-made-by-iit-students-to-save-crops-from-wildlife-19466/

वन्यजीवों से फसलों को बचाने के लिए आईआईटी छात्रों ने बनाया नया संवेदी यंत्र

कहते हैं कि अगर देश को किसी भी क्षेत्र में विकास करना है तो उस क्षेत्र में तकनीकी विकास का होना बहुत आवश्यक है। कुछ ऐसा ही विकास कार्य आईआईटी मद्रास के विद्यार्थियों ने कर दिखाया है। उन्होंने कृषि क्षेत्र में किसानों की समस्या का निवारण करते हुए एक ऐसा यंत्र बनाया है जिससे अब किसानों को रातभर जगकर अपनों फसलों और खेतों की रखवाली नहीं करनी होगी। जी हां, आईआईटी मद्रास के द रूरल टेक्नोलॉजी एक्शन ग्रुप फॉर तमिलनाडु के शोधकर्ताओं ने ऐसा संवेदी यंत्र विकसित किया है जो किसानों को खेत में जानवर के आने या होने की सूचना देगा। इस उपकरण को रवि खत्री और एस.सरथ नामक दो छात्रों ने मिलकर बनाया है।

स यंत्र में अलार्म व बल्ब लगे होंगे जैसे ही कोई जानवर इस यंत्र के करीब आएगा यह बजने व जलने लगेगा जिससे जानवर भयभीत होकर भाग जाएंगे। साथ ही अलॉर्म की आवाज से किसान को भी सूचना मिल जाएगा कि कोई जानवर उसके खेत में आ गया है। इस यंत्र में दो सेंसर लगे हैं और इसको खेत से 10 मीटर की दूरी पर लगाया जाता है। जैसा कि हमें पता है कि किस तरह हमारे देश के किसान दिन-रात जागकर फसलों की सुरक्षा करते हैं कि ताकि कोई नीलगाय,जंगली सूअर,बैल आदि आकर उनकी मेहनत पर पानी न फैर जाए। लेकिन अब इस यंत्र से उनको रातभर जगना नहीं पड़ेगा। साथ ही हमारे किसानों के लिए सबसे बड़ी परेशानी होती है किसी भी तकनीक को इस्तेमाल करने के लिए उसमें व्यय धन और तकनीकी परेशानियां। इसलिए इसका लागत किसानों के आय के मुफीद रखने की कोशिश की गई है। जानकारी के मुताबिक, इस यंत्र को बैटरी से चलाया जाता है लेकिन इसको सौर उर्जा से चलाए जाने पर काम चल रहा है। इसका रखरखाव भी काफी आसान है और कोई जानवर इसे छू भी नहीं सकता क्योंकि उससे पहले ही ये बज उठेगा। इस यंत्र के प्रोटोटाइप का परीक्षण आईआईटी मद्रास के परिसर में हिरणों की उपस्थिति को जांचने के लिए किया जा रहा है, जिसके बाद इसे अगस्त महीने में लांच किया जाएगा।

Date: 30th June 2017
Publication: Hindi India Water Portal
Edition: Online
Journalist: Navneet Kumar Gupta
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri and S Sath
Headline: New sensor made by IIT students to protect crops from wildlife
URL: http://hindi.indiawaterportal.org/node/55754

फसलों को वन्यजीवों से बचाने के लिये आईआईटी के छात्रों ने बनाया नया संवेदी यंत्र

Author: नवनीत कुमार गुप्ता
Source: इंडिया साइंस वायर, 28 जून 2017

नई दिल्ली, 28 जून (इंडिया साइंस वायर) : फसलों को वन्यजीवों से बचाने के लिये भारतीय शोधकर्ताओं ने अब एक नया संवेदी यंत्र विकसित किया है, जो किसानों को फसलों की बर्बादी के कारण होने वाले आर्थिक नुकसान से बचा सकता है।

भारतीय प्रौद्योगिकी संस्थान (आईआईटी), मद्रास के 'द रूरल टेक्नोलॉजी एक्शन ग्रुप फॉर तमिलनाडु' के शोधकर्ताओं ने ऐसा संवेदी यंत्र का विकसित किया है, जो अलार्म एवं रोशनी के जरिये खेत में जानवरों की मौजूदगी की सूचना देकर किसानों को सतर्क कर सकता है। इस उपकरण को आईआईटी-मद्रास के छात्र रवि खत्री और एस. सरथ ने मिलकर तैयार किया है।

इस यंत्र में दो सेंसर लगाए गए हैं, जिनमें से एक पैसिव इन्फ्रा-रेड सेंसर और दूसरा माइक्रोवेव सेंसर है। इसके अलावा एक अलार्म और प्रकाशीय युक्ति भी इसमें जोड़ी गई है। इस यंत्र के प्रोटोटाइप का परीक्षण आईआईटी-मद्रास के परिसर में हिरणों की मौजूदगी को जाँचने के लिये किया जा रहा है, जिसके बाद इसे अगस्त में चेन्नई के नेर्कुन्नम क्षेत्र में इसे लगाया जाएगा।

इस उपकरण को खेत में दस मीटर की दूरी पर लगाया जाता है। जैसे ही कोई जानवर इसके करीब आता है तो इसमें लगे सेंसर उसकी उपस्थिति को भाँप लेते हैं और उपकरण में लगी लाइटें जलने लगती हैं एवं अलार्म बजने लगता है। अलार्म की आवाज और लाइटों को देखकर जानवर दूर भाग जाते हैं। किसान को भी पता चल जाता है कि उनके खेत में कोई जानवर घुस आया है।

ग्रामीण प्रौद्योगिकी केंद्र के प्रोफेसर अभिजीत पी. देशपांडे के अनुसार "यह उपकरण इस प्रकार विकसित किया गया है कि एक फसल लेने के बाद जब खेत खाली हो तो इसे आसानी से निकालकर रखा जा सके।

जब किसान दोबारा फसल उपजाए तो इस उपकरण को खेत में फिर से लगा सकते हैं।’ ’ देशपांडे के अनुसार ‘‘भारत में अधिकांश आबादी का जीवन खेती पर निर्भर है। इस तरह की आधुनिक प्रौद्योगिकियों की मदद से किसान अपनी फसलों की रक्षा कर सकते हैं।’ ’

देश के विभिन्न हिस्सों में हाथी, नीलगाय और जंगली सुअर जैसे वन्यजीव अक्सर अपने आवास स्थलों से निकलकर खेत-खलिहानों तक आ जाते हैं। फसलों को नुकसान पहुँचाने के अलावा कई बार इन जीवों का इंसानों से टकराव भी हो जाता है। तेंदुआ, बाघ और भेड़िए जैसे मांसाहारी जीव पालतू पशुओं के साथ-साथ कई बार वन्यजीव इंसानों को भी अपना शिकार बना लेते हैं। इस समस्या से निपटने के लिये परम्परागत तकनीकों का सहारा लिया जाता है। कहीं पर मिर्च जलाकर जानवरों को दूर भगाने की कोशिश की जाती है, तो कभी उन पर हमला कर दिया जाता है। कभी-कभार आग से भी इन जानवरों को डराया जाता है। लेकिन, समस्या जस की तस बनी हुई है।

इस नए उपकरण के विकास में योगदान देने वाले छात्र रवि खत्री के अनुसार "इस उपकरण में लगा पैसिव इन्फ्रा-रेड संवेदक (सेंसर) जानवर के शरीर के तापमान से प्रभावित होता है और माइक्रोवेव संवेदक जानवर की मौजूदगी को आसानी से भाँप लेता है। किसानों को रात भर जागकर अपने खेत की पहरेदारी करनी पड़ती है। लेकिन, यह उपकरण अब किसानों को खेत में उत्पात मचाने वाले जानवरों की उपस्थिति की सूचना समय रहते दे देगा, जिससे किसान जानवरों को भगा सकते हैं।" विश्व के अनेक देशों ने कई आधुनिक प्रौद्योगिकीयों का भी विकास किया है। लेकिन ये तकनीकें महँगी होने के कारण हमारे देश में प्रचलित नहीं हो सकीं क्योंकि हमारे देश में अधिकांश किसान आर्थिक रूप से इतने समर्थ नहीं हैं।

इस परियोजना से जुड़ी संध्या सीतारामन ने इंडिया साइंस वायर को बताया कि “अभी इस उपकरण को बैटरी से चलाया जाता है, लेकिन भविष्य में इसे सौर ऊर्जा की मदद से चलाने की संभावना को तलाशा जा रहा है। इसके अलावा इस उपकरण की लागत को कम करने के प्रयास भी किए गए हैं, ताकि ज्यादा किसान इस उपकरण का फायदा उठा सकें।”

प्रोफेसर देशपांडे के अनुसार “खेत में इस उपकरण को लगाने के लिये करीब दो हजार रुपये लागत आती है। इसका रखरखाव आसान है और कोई जानवर इसे नुकसान भी नहीं पहुँचाता। फिलहाल इस यंत्र को खेत में पाँच से दस मीटर की दूरी पर लगाया जाता है। इस दूरी को बढ़ाए जाने की कोशिश भी की जा रही है। ” (इंडिया साइंस वायर)

Date: 30th June 2017
Publication: Prabha Sakshi
Edition: Online
Journalist: Navneet Kumar Gupta
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri and S Sath
Headline: This new sensor will save crops from wildlife
URL: http://www.prabhasakshi.com/news/proventhings/new-device-will-save-crops-from-wildlife/26346.html

फसलों को वन्यजीवों से बचाएगा यह नया संवेदी यंत्र


नवनीत कुमार गुप्ता। (इंडिया साइंस वायर)। फसलों को वन्यजीवों से बचाने के लिए भारतीय शोधकर्ताओं ने अब एक नया संवेदी यंत्र विकसित किया है, जो किसानों को फसलों की बर्बादी के कारण होने वाले आर्थिक नुकसान से बचा सकता है। भारतीय प्रौद्योगिकी संस्थान (आईआईटी), मद्रास के द रूरल टेक्नोलॉजी एक्शन ग्रुप फॉर तमिलनाडु के शोधकर्ताओं ने ऐसा संवेदी यंत्र का विकसित किया है, जो अलार्म एवं रोशनी के जरिये खेत में जानवरों की मौजूदगी की सूचना देकर किसानों को सतर्क कर सकता है। इस उपकरण को आईआईटी-मद्रास के छात्रों रवि खत्री और एस. सरथ ने मिलकर तैयार किया है।

इस यंत्र में दो सेंसर लगाए गए हैं, जिनमें से एक पैसिव इन्फ्रा-रेड सेंसर और दूसरा माइक्रोवेव सेंसर है। इसके अलावा एक अलार्म और प्रकाशीय युक्ति भी इसमें जोड़ी गई है। इस यंत्र के प्रोटोटाइप का परीक्षण आईआईटी-मद्रास के परिसर में हिरणों की मौजूदगी को जांचने के लिए किया जा रहा है, जिसके बाद इसे अगस्त में चेन्नई के नेर्कुन्नम क्षेत्र में इसे लगाया जाएगा। इस उपकरण को खेत में दस मीटर की दूरी पर लगाया जाता है। जैसे ही कोई जानवर इसके करीब आता है तो इसमें लगे सेंसर उसकी उपस्थिति को भांप लेते हैं और उपकरण में लगी लाईटें जलने लगती हैं एवं अलार्म बजने लगता है। अलार्म की आवाज और लाईटों को देखकर जानवर दूर भाग जाते हैं। किसान को भी पता चल जाता है कि उनके खेत में कोई जानवर घुस आया है। ग्रामीण प्रौद्योगिकी केंद्र के प्रोफेसर अभिजीत पी. देशपांडे के अनुसार ‘‘यह उपकरण इस प्रकार विकसित किया गया है कि एक फसल लेने के बाद जब खेत खाली हो तो इसे आसानी से निकालकर रखा जा सके। जब किसान दोबारा फसल उपजाए तो इस उपकरण को खेत में फिर से लगा सकते हैं।’

देशपांडे के अनुसार ‘‘भारत में अधिकांश आबादी का जीवन खेती पर निर्भर है। इस तरह की आधुनिक प्रौद्योगिकियों की मदद से किसान अपनी फसलों की रक्षा कर सकते हैं।’ ’ देश के विभिन्न हिस्सों में हाथी, नीलगाय और जंगली सुअर जैसे वन्यजीव अक्सर अपने आवास स्थलों से निकलकर खेत-खलिहानों तक आ जाते हैं। फसलों को नुकसान पहुंचाने के अलावा कई बार इन जीवों का इंसानों से टकराव भी हो जाता है। तेंदुआ, बाघ और भेड़िए जैसे मांसाहारी जीव पालतू पशुओं के साथ-साथ कई बार वन्यजीव इंसानों को भी अपना शिकार बना लेते हैं। इस समस्या से निपटने के लिए परंपरागत तकनीकों को सहारा लिया जाता है। कहीं पर मिर्च जलाकर जानवरों को दूर भगाने की कोशिश की जाती है, तो कभी उन पर हमला कर दिया जाता है। कभी-कभार आग से भी इन जानवरों को डराया जाता है। लेकिन, समस्या जस की तस बनी हुई है। इस नए उपकरण के विकास में योगदान देने वाले छात्र रवि खत्री के अनुसार "इस उपकरण में लगा पैसिव इन्फ्रा-रेड संवेदक (सेंसर) जानवर के शरीर के तापमान से प्रभावित होता है और माइक्रोवेव संवेदक जानवर की मौजूदगी को आसानी से भांप लेता है। किसानों को रात भर जागकर अपने खेत की पहरेदारी करनी पड़ती है। लेकिन, यह उपकरण अब किसानों को खेत में उत्पात मचाने वाले जानवरों की उपस्थिति की सूचना समय रहते दे देगा, जिससे किसान जानवरों को भगा सकते हैं।" विश्व के अनेक देशों ने कई आधुनिक प्रौद्योगिकीयों का भी विकास किया है। लेकिन ये तकनीकें महंगी होने के कारण हमारे देश में प्रचलित नहीं हो सकीं क्योंकि हमारे देश में अधिकांश किसान आर्थिक रूप से इतने समर्थ नहीं हैं। इस परियोजना से जुड़ी संध्या सीतारामन ने इंडिया साइंस वायर को बताया कि “अभी इस उपकरण को बैटरी से चलाया जाता है, लेकिन भविष्य में इसे सौर ऊर्जा की मदद से चलाने की संभावना को तलाशा जा रहा है। इसके अलावा इस उपकरण की लागत को कम करने के प्रयास

भी किए गए हैं, ताकि ज़्यादा किसान इस उपकरण का फायदा उठा सकें।" प्रोफेसर देशपांडे के अनुसार "खेत में इस उपकरण को लगाने के लिए करीब दो हजार रुपये लागत आती है। इसका रखरखाव आसान है और कोई जानवर इसे नुकसान भी नहीं पहुंचाता। फिलहाल इस यंत्र को खेत में पांच से दस मीटर की दूरी पर लगाया जाता है। इस दूरी को बढ़ाए जाने की कोशिश भी की जा रही है।" (इंडिया साइंस वायर)

Date: 30th June 2017
Publication: Down to Earth
Edition: Online
Journalist: Navneet Kumar Gupta
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri and S Sath
Headline: Equipment to save crops from animals
URL:http://www.downtoearth.org.in/hindistory/%E0%A4%9C%E0%A4%BE%E0%A4%A8%E0%A4%B5%E0%A4%B0%E0%A5%8B%E0%A4%82-%E0%A4%B8%E0%A5%87-%E0%A4%AB%E0%A4%B8%E0%A4%B2%E0%A5%8B%E0%A4%82-%E0%A4%95%E0%A5%8B-%E0%A4%AC%E0%A4%9A%E0%A4%BE%E0%A4%8F%E0%A4%97%E0%A4%BE-%E0%A4%AF%E0%A4%82%E0%A4%A4%E0%A5%8D%E0%A4%B0-58174

जानवरों से फसलों को बचाएगा यंत्र

फसलों को वन्यजीवों से बचाने के लिए भारतीय शोधकर्ताओं ने अब एक नया संवेदी यंत्र विकसित किया है, जो किसानों को फसलों की बर्बादी के कारण होने वाले आर्थिक नुकसान से बचा सकता है।

भारतीय प्रौद्योगिकी संस्थान (आईआईटी), मद्रास के द रूरल टेक्नोलॉजी एक्शन ग्रुप फॉर तमिलनाडु के शोधकर्ताओं ने ऐसा संवेदी यंत्र का विकसित किया है, जो अलार्म एवं रोशनी के जरिये खेत में जानवरों की मौजूदगी की सूचना देकर किसानों को सतर्क कर सकता है। इस उपकरण को आईआईटी-मद्रास के छात्रों रवि खत्री और एस. सरथ ने मिलकर तैयार किया है।

इस यंत्र में दो सेंसर लगाए गए हैं, जिनमें से एक पैसिव इन्फ्रा-रेड सेंसर और दूसरा माइक्रोवेव सेंसर है। इसके अलावा एक अलार्म और प्रकाशीय युक्ति भी इसमें जोड़ी गई है। इस यंत्र के प्रोटोटाइप का परीक्षण आईआईटी-मद्रास के परिसर में हिरणों की मौजूदगी को जांचने के लिए किया जा रहा है, जिसके बाद इसे अगस्त में चेन्नई के नेर्कुन्नम क्षेत्र में इसे लगाया जाएगा।

इस उपकरण को खेत में दस मीटर की दूरी पर लगाया जाता है। जैसे ही कोई जानवर इसके करीब आता है तो इसमें लगे सेंसर उसकी उपस्थिति को भांप लेते हैं और उपकरण में लगी लाईटें जलने लगती हैं एवं अलार्म बजने लगता है। अलार्म की आवाज और लाईटों को देखकर जानवर दूर भाग जाते हैं। किसान को भी पता चल जाता है कि उनके खेत में कोई जानवर घुस आया है।

ग्रामीण प्रौद्योगिकी केंद्र के प्रोफेसर अभिजीत पी. देशपांडे के अनुसार ‘‘यह उपकरण इस प्रकार विकसित किया गया है कि एक फसल लेने के बाद जब खेत खाली हो तो इसे आसानी से निकालकर रखा जा सके। जब किसान दोबारा फसल उपजाए तो इस उपकरण को खेत में फिर से लगा सकते है।’ ’ देशपांडे के अनुसार ‘‘भारत में अधिकांश आबादी का जीवन खेती पर निर्भर है। इस तरह की आधुनिक प्रौद्योगिकियों की मदद से किसान अपनी फसलों की रक्षा कर सकते हैं।’ ’

देश के विभिन्न हिस्सों में हाथी, नीलगाय और जंगली सुअर जैसे वन्यजीव अक्सर अपने आवास स्थलों से निकलकर खेत-खलिहानों तक आ जाते है। फसलों को नुकसान पहुंचाने के अलावा कई बार इन जीवों का इंसानों से टकराव भी हो जाता है। तेंदुआ, बाघ और भेड़िए जैसे मांसाहारी जीव पालतू पशुओं के साथ-साथ कई बार वन्यजीव इंसानों को भी अपना शिकार बना लेते हैं।

इस समस्या से निपटने के लिए परंपरागत तकनीकों को सहारा लिया जाता है। कहीं पर मिर्च जलाकर जानवरों को दूर भगाने की कोशिश की जाती है, तो कभी उन पर हमला कर दिया जाता है। कभी-कभार आग से भी इन जानवरों को डराया जाता है। लेकिन, समस्या जस की तस बनी हुई है।

इस नए उपकरण के विकास में योगदान देने वाले छात्र रवि खत्री के अनुसार "इस उपकरण में लगा पैसिव इन्फ्रा-रेड संवेदक (सेंसर) जानवर के शरीर के तापमान से प्रभावित होता है और माइक्रोवेव संवेदक जानवर की मौजूदगी को आसानी से भांप लेता है। किसानों को रात भर जागकर अपने खेत की पहरेदारी करनी पड़ती है। लेकिन, यह उपकरण अब किसानों को खेत में उत्पात मचाने वाले जानवरों की उपस्थिति की सूचना समय रहते दे देगा, जिससे किसान जानवरों को भगा सकते हैं।"

विश्व के अनेक देशों ने कई आधुनिक प्रौद्योगिकीयों का भी विकास किया है। लेकिन ये तकनीकें महंगी होने के कारण हमारे देश में प्रचलित नहीं हो सकीं क्योंकि हमारे देश में अधिकांश किसान आर्थिक रूप से इतने समर्थ नहीं हैं।

इस परियोजना से जुड़ी संध्या सीतारामन ने इंडिया साइंस वायर को बताया कि “अभी इस उपकरण को बैटरी से चलाया जाता है, लेकिन भविष्य में इसे सौर ऊर्जा की मदद से चलाने की संभावना को तलाशा जा रहा है। इसके अलावा इस उपकरण की लागत को कम करने के प्रयास भी किए गए हैं, ताकि ज्यादा किसान इस उपकरण का फायदा उठा सकें। ”

प्रोफेसर देशपांडे के अनुसार “खेत में इस उपकरण को लगाने के लिए करीब दो हजार रुपये लागत आती है। इसका रखरखाव आसान है और कोई जानवर इसे नुकसान भी नहीं पहुंचाता। फिलहाल इस यंत्र को खेत में पांच से दस मीटर की दूरी पर लगाया जाता है। इस दूरी को बढ़ाए जाने की कोशिश भी की जा रही है।”

Date: 30th June 2017
Publication: Navodya Times
Edition: Online
Journalist: Navneet Kumar Gupta
Professor: Prof. Abhijit P Deshpande
Alumni/students: Ravi Khatri and S Sath
Headline: This new device of IIT students will save crops from animals
URL: http://www.navodayatimes.in/news/national/this-new-device-of-iit-students-will-save-crops-from-animals/46249/

जानवरों से फसलों को बचाएगा आईआईटी छात्रों का ये नया यंत्र

नई दिल्ली/अंकुर शुक्ला। खून-पसीना एक करके किसान बड़ी मेहनत से फसल तैयार करते हैं, लेकिन जंगली जानवर जब हमला करते हैं तो खेत के खेत तबाह हो जाते हैं। इस तबाही से फसलों को बचाने के लिए आईआईटी के छात्रों ने एक खास किस्म का भोंपू और सिस्टम तैयार किया है। इस व्यवस्था से फसलों को जंगली जानवरों से बचाया जा सकेगा।

आईआईटी छात्रों द्वारा बनाया गया यह सिस्टम खेत के पास किसी जानवर के पहुंचने पर किसानों को सतर्क कर सकता है। दो सेंसर लगाए गए हैं, जिनमें से एक पैसिव इंफ्रारेड सेंसर और दूसरा माइक्रोवेव सेंसर है। इसके अलावा एक अलार्म और लाइट सिस्टम भी जोड़ा गया है। यस यंत्र आईआईटी-मद्रास के छात्र रवि खत्री और एस सरथ ने मिलकर तैयार किया है। इसका परीक्षण आईआईटी मद्रास के परिसर में हिरणों की मौजूदगी को जांचने के लिए किया जा रहा है। अगस्त में चेन्नई के नेर्कुन्नम क्षेत्र में इसे लगाया जाएगा।

आईआईटी दिल्ली के ग्रामीण प्रौद्योगिकी केंद्र के प्रोफेसर अभिजीत पी. देशपांडे के अनुसार उपकरण फसल काटे जाने के बाद यंत्र बड़ी आसानी से निकाला जा सकता है और फिर से नई फसल तैयार होने पर उसमें लगाया जा सकता है। प्रोफेसर देशपांडे के मुताबिक खेत में एक उपकरण को लगाने में करीब 2000 रुपए की लागत आती है।

इसका रखरखाव आसान है और कोई जानवर इसे नुकसान भी नहीं पहुंचाता। उन्होंने बताया कि विदेशों में इस तरह के यंत्र बनाए गए हैं, लेकिन वह काफी महंगे हैं। अब यह भारतीय सिस्टम सस्ता होने के कारण किसानों तक आसानी से पहुंच सकेगा।

ऐसे काम करता है यंत्र
इस यंत्र को खेत से 10 मीटर पहले लगाया जाता है। उपकरण में लगा पैसिव इंफ्रा-रेड संवेदक (सेंसर) जानवर के शरीर के तापमान से प्रभावित होता है और माइक्रोवेव संवेदक जानवर की मौजूदगी को आसानी से भांप लेता है। जैसे ही कोई

जानवर इसके करीब आता है तो इसमें लगे सेंसर उसकी उपस्थिति को भांप लेते हैं और उपकरण में लगी लाइटें जलने लगती हैं एवं अलार्म बजने लगता है।

अलार्म की आवाज और लाइटों को देखकर जानवर दूर भाग जाते हैं। किसान को भी पता चल जाता है कि उनके खेत में कोई जानवर घुस आया है। खेत के आकार के हिसाब से यंत्रों की संख्या और उसकी सेंसर करने की क्षमता को निर्धारित किया जाता है।

IIT Madras is an innovation and entrepreneurship hub

Date: 11th June 2017
Publication: Business World
Edition: Online
Journalist: NA
Professor: Prof. Thillai Rajan
Headline: "Private Equity-Backed Companies Outperform Peers": Venture Intelligence
URL: http://bwdisrupt.businessworld.in/article/-Private-Equity-Backed-Companies-Outperform-Peers-Venture-Intelligence/10-06-2017-119853/

"Private Equity-Backed Companies Outperform Peers": Venture Intelligence

According to a new study by Venture Intelligence, a research firm focussed on private company financials, transactions and their valuations in India, private equity (including venture capital) backed companies are growing significantly faster as compared to companies that did not have any PE-VC funding and also publicly listed companies that comprise market indices like Sensex, Nifty and CNX Midcap.

The Private Equity Impact study, first conducted in 2007, measures the impact of PE and VC funds on the Indian economy using quantitative and qualitative methods. This year, with advice and guidance from Prof. Thillai Rajan, of the Department of Management Studies at IIT-Madras, the study compared PE and VC-backed companies vis-à-vis those that did not have any PE/VC funding and other indices using quantitative and qualitative parameters.

Highlights from the Venture Intelligence report

In the six years between 2011 and 2016, PE-VC firms invested over 72 billion dollars in Indian companies – over 6.5 times what Corporate India raised via Initial Public Offerings (IPOs) during the same period.

PE investment is largely associated with smaller companies. The average size of PE funded firms in terms of revenues and assets are about one-sixth of all listed firms. Revenue growth of PE-VC backed companies are more than twice that of other benchmarks. Added to that, PE-VC investment is associated not just with top line growth but also with growth in asset creation; in addition, PE-VC funded companies exhibit a more efficient working capital management as compared to listed peers

The profit growth of PE-VC funded companies is the lowest among the benchmarks indicating a predominant focus of such companies on long term growth, sacrificing bottomline focus in the short term. Lower asset returns, cash returns on capital invested and asset turnover in PE-VC funded companies indicate a focus on long term growth while PE-VC investments helps to increase the equity base to attract debt capital. PE-VC investors provide a degree of comfort to lenders as indicated in debt levels and costs

The primary markets are characterized by significant volatility. PE-VC investors do continue to invest even in times even when there is a squeeze in conventional markets, thereby helping the companies to tide over the industry down cycles. As promoters of small-to-mid sized companies typically face limitations in terms of the quantum of equity contribution they can make, PE-VC investors step in to provide the long term funding require to catalyze growth.

Founders of start-ups are often not well versed with “once in a lifetime of a company” processes such as IPO, M&A and so on. Since many PE-VC investors have prior experience in the financial services industry as well as in addition to working with other investee companies in their portfolio, they are able to help promoters steer through the complexities.

“The PE Impact Study demonstrates how PE and VC firms adopt a long term perspective in their investment decisions. The presence of a PE/VC investor provides a kind of certification which, while broadening the equity base, also helps the investee companies access other sources of funding including debt capital. PE/VC investors also forge active partnerships with their investee companies to improve growth and business strategy, besides opening up new opportunities,” said Prof. Thillai Rajan.

“The common thread that emerges from the study is that PE-VC investment, when chosen and leveraged well, can help companies scale up rapidly and accelerate growth in several ways that add significant value to the Indian economy,” said Arun Natarajan, CEO of Venture Intelligence.

Date: 20th June 2017
Publication: The Economic Times
Edition: Delhi/Mumbai/Pune/Bangalore/Kolkata/Chennai/Ahmedabad/Hyderabad
Page no.: 8
Journalist: NA
Professor: Prof. Prof. Bhaskar Ramamurthi
Headline: IITs, IIMs & Bennett Univ Look to Ignite Entrepreneurial Spark
URL:http://economictimes.indiatimes.com/articleshow/59225717.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

IITs, IIMs & Bennett Univ Look to Ignite Entrepreneurial Spark

Our Bureau

Mumbai/New Delhi: Next month, nine students from Bennett University will head to Babson College for a two-week startup boot camp to learn about entrepreneurship and brainstorm ideas with about 300 other college students from around the world.

This partnership with Babson Collaborative and the immersive experience will help strengthen the entrepreneurial culture being developed at Bennett University.

About 10% of Bennett students are engaged with The Bennett Hatchery— the on-campus startup incubator that's part of the Center for Innovation and Entrepreneurship at the university — in various stages of taking their startup ideas forward. The incubator handholds and mentors student startups, providing them business advice and market connects. Students can also apply to get up to ₹10 lakh seed funding for their startup.

Leading institutes across the country, including Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs) and new-age universities such as Bennett are going all out to encourage entrepreneurship among students so that they can create significant economic and social impact at a national and, eventually, global scale. Incubation and entrepreneurship cells, startup boot camps, mentoring, generous stipends and access to capital are just some of the ways schools are trying to foster an entrepreneurial culture.

"In a world filled with uncertainty, we see opportunity – and accordingly we are pushing the limits of creativity and skills in our young students by giving them the building blocks for building a life for themselves," said Bennett University vice-chancellor Yaj Medury. "Students are able to appreciate the fact that the future rests in the hands of innovators, risk takers and entrepreneurs."

Ajay Batra, director of the entrepreneurship centre, said, "We focus on building students' entrepreneurial mindsets and mentor them to create world-class commercial or social organizations."

At IIT Madras, The Centre for Innovation's Student Lab encourages the concept of 'walk in with an idea, walk out with a product'. The institute recently established a Gopalakrishanan-Deshpande Centre for Innovation and Entrepreneurship that will provide the global thought leadership that will help launch the next generation of solutions from the institute's labs as well as from among young students.

"The Entrepreneurship Cell plays a pivotal role in encouraging and nurturing entrepreneurial aspirations of students right at an undergraduate level," said IIT Madras director Bhaskar Ramamurthi.

The IIT Madras Incubation Cell (IITMIC) has sector-specific units, such as Rural Technology and Business Incubator (RTBI), the Bio Incubator (BI) and the Healthcare Technology Innovation Centre (HTIC). It has incubated around 120 companies so far.

IIT Mandi has had an E-cell for some time now and last year launched Catalyst, a technology business incubator with plans to boost new business startups. IIT Mandi director Timothy A Gonsalves said that, till now, it has incubated several startups by students.

About 10% of Bennett students are engaged with The Bennett Hatchery & are at various stages of taking their startup ideas forward

Universities and engineering institutes apart, business schools are pushing the entrepreneurship agenda equally strongly. IIM Udaipur, for instance, believes that companies today need an innovator to survive, not just a manager. The institute has an incubation centre as well as a dedicated student committee to help budding entrepreneurs.

"We allow a special summer entrepreneurship programme, where aspiring entrepreneurs work on their ideas, instead of going for the routine summer placements provided. The college provides a fixed stipend for them to work with," said Arun Singhal, mentor, incubation centre, IIM Udaipur.

Older IIMs like the one at Kozhikode are also keen on entrepreneurship. IIM Kozhikode has set up a business incubator and entrepreneurship development centre called LIVE–Laboratory for Innovation, Venturing and Entrepreneurship–to support startup enterprises and evangelise entrepreneurship.

LIVE supports founder talks, guest speakers and others from the startup ecosystem in order to promote entrepreneurship. It supports campus events organised by student E-cells such as Startosphere–an annual entrepreneur-investor meet and innovation challenge. In addition, there are elective courses on entrepreneurship and new business ventures besides managing innovations, said Keyoor Purani, executive director, IIMK LIVE.

Placement holidays are another policy that schools offer. A student willing to start a venture can pursue entrepreneurship with an assurance that after two years, she can participate in on-campus job placement programmes. IIM Kozhikode has such a scheme in place, as does SP Jain Institute of Management and Research (SPJIMR), which offers a deferred placement option with a stipend for two years. "We also provide mentoring, connection with inventors and alumni and assistance with various aspects of the process," said Ranjan Banerjee, dean, SPJIMR. Students from the institute recently took part in a global entrepreneurship competition in Thailand and finished second.

Date: 27th June
Publication: Outlook Business
Edition: National
Page no: 23
Journalist: NA
Professor: Prof. Krishnan Balasubramanian
Alumni: Daniel Raj David, AS Harikrishnan, R Karthik
Headline: Playing watch guard
URL: https://www.outlookbusiness.com/enterprise/big-idea/playing-watch-guard-3552

THE LIFEGUARDS (L-R): Daniel Raj David, Professor Krishnan Balasubramanian and Harikrishnan AS.

RA CHANDROO

DETECT TECHNOLOGIES

Started
February 2016
Initial investment
₹2.5 crore
Installation cost
₹1-15 lakh
FY18 revenue estimate
₹2.8-3 crore

Playing Watch Guard

It was the night of December 2, 1984. An undetected leakage in a pesticide plant released the poisonous methyl isocyanate gas that claimed around 20,000 lives and left half a million marred for life. Thirty years later, the Bhopal Gas Tragedy continues to haunt the victims. Down south in the city of Chennai, three final year engineering students and their professor have developed an algorithm-based solution that could help prevent such a catastrophe in the future.

Incubated in IIT Madras with a grant of ₹1 million, DeTect Technologies, was founded by Daniel Raj David, AS Harikrishnan, R Karthik and professor Krishnan Balasubramanian. David, CEO, of the company explains the goal they set out with, "We wanted to build a cutting-edge technology to monitor asset management systems and save lives lost due to avoidable leakages".

The start-up has developed a product called the Guided Ultrasonic Monitoring of Pipeline Systems (GuMPS). The team's major breakthrough lies in developing a sensor that can operate in temperatures ranging from -20°C to 350°C, as such are the mercury levels at which fluids pass through an oil or gas pipeline. DeTect's second product is a manually controlled robot, Scope-I that can enter a pipeline and scan it thoroughly for a possible leak.

The pipeline management system will end up saving crores for the oil and gas companies who have to shut down an entire pipeline during a leakage due to inability to detect the exact spot. The start-up managed to sign up industry behemoth Reliance Industries as its first client. It is currently in talks with seven other leading players in the sector such as Tata Petrodyne, the Adani group, British Petroleum, etc. "We want to launch the products in the international market; USA, West Asia and Singapore are our prime targets," David adds. –SIDDHI NAYAK