



## NEWS CLIPS

March 23-29, 2019

### Highlights of the Week@IITD

**मिली सेकेंड में टीबी-कैंसर का पता लगाएगा IIT Delhi का ये सिस्टम, जानें कैसे करेगा काम  
वरिष्ठ संवाददाता, नई दिल्ली**

**March 27, 2019** <https://www.livehindustan.com/health/story-researchers-in-iit-delhi-develop-ai-based-detector-for-malaria-tb-cervical-cancer-2463344.html>



अब बस मिलीसेकेंड में मलेरिया, तपेदिक(टीबी), आंत में मौजूद बैक्टीरिया और गर्भाशय के कैंसर का पता लग सकेगा। इसके लिए आईआईटी दिल्ली के अनुसंधानकर्ताओं ने कृत्रिम बुद्धिमत्ता पर आधारित हार्डवेयर प्रणाली विकसित की है। आईआईटी-डी के इलेक्ट्रिकल इंजीनियरिंग विभाग के असिस्टेंट प्रोफेसर डॉ मनन सूरी व उनके शोधार्थियों की टीम ने इसे तैयार किया है। मंगलवार को डॉ मनन सूरी ने मीडिया को इसकी जानकारी दी।

डॉ मनन के अनुसार यह अनुसंधान न्यूरोमॉर्फिक प्रणाली बनाने पर आधारित है। इसका प्रयोग सीमित संसाधनों वाले क्षेत्रों जैसे गांव और दूरदराज के इलाकों में स्वास्थ्य सुविधाएं देने के लिए किया जाएगा जहां मानव विशेषज्ञों की पहुंच सीमित है। उन्होंने कहा कि स्वास्थ्य सेवा एवं निदान संबंधित अनुप्रयोगों के लिए आर्टिफिशियल इंटेलिजेंस प्रारूप के कई सॉफ्टवेयर मौजूद हैं।

लेकिन वक्त की मांग है कि इन प्रारूपों को एक जगह से दूसरी जगह ले जा सकने वाले कम ऊर्जा की खपत करने वाले उपकरण में कैसे प्रभावी ढंग से ढालें ताकि कम संसाधनों वाले स्थानों पर ये

पहुंच सकें। प्रो सूरी के साथ इस प्रोजेक्ट पर शोध के छात्र कुशल सेठी, नारायणी भाटिया, विवेक व श्रीडू वर्मा ने भी काम किया है। इनके इस प्रोजेक्ट को राष्ट्रपति भवन में भी प्रदर्शित किया जा चुका है। साथ ही इन्हें गांधियन यंग टेक्नोलॉजी इन्वेंशन अवॉर्ड से सम्मानित किया जा चुका है।

**कम ऊर्जा खपत पर करेगा काम :**

प्रो डॉ सूरी ने बताया कि यह कोई उत्पाद नहीं बल्कि कई बीमारियों का पता लगाने वाला आर्टिफिशियल इंटेलिजेंस (एआई) पर आधारित कम उर्जा पर चलने वाला एक हार्डवेयर सिस्टम है। यह सिर्फ एक सेंकेंड के हजारवें हिस्से में ही मलेरिया, टीबी, सर्विकल कैंसर जैसी बीमारियों का इंसानी कोशिकाओं के संकेत के जरिये पता लगाएगा। अभी इस प्रोजेक्ट का कार्य प्रगति पर है। इसमें और भी काम करने की जरूरत है। यह सिस्टम पहले से मौजूद माइक्रोस्कोप में कोशिकाओं के निदान की प्रक्रिया में एक सपोर्ट सिस्टम की तरह है। डॉ मनन का दावा है कि यह सबसे कम समय में बीमारी का निदान करने की प्रणाली है।

### **IIT Delhi develops AI hardware to detect diseases and help diagnostic treatments in rural, resource-constrained areas**

**March 27, 2019** <https://www.indiatoday.in/education-today/news/story/iit-delhi-develops-ai-hardware-to-detect-diseases-and-help-diagnostic-treatments-in-rural-resource-constrained-areas-1487728-2019-03-27>

*Researchers at IIT- Delhi have developed an AI hardware system to provide cost-effective diagnostic treatments for diseases like malaria, tuberculosis, etc in areas with low recourses.*



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Researchers at the Indian Institute of Technology (IIT) have developed an artificial intelligence (AI)-based low-power electronic hardware system that can help in detecting diseases like malaria, tuberculosis, an intestinal parasite, and cervical cancer in a few milliseconds.

The research focuses on building a neuromorphic system which can be used for healthcare access in resource-constrained areas with limited access to human specialists.

IIT Delhi professor at Department of Electrical Engineering, Manan Suri said that while several software AI models exist for healthcare and diagnostic related applications, need of the hour is to efficiently map these models on portable dedicated low-power, low-cost hardware to enable edge-AI systems accessible to all in low resource environment.

#### **How will this technology benefit society?**

Suri, who is leading the team of researchers, said microscopy is particularly well adapted to low-resource, high disease burden areas, the technology is simple and versatile even for diagnostic tasks.

While newer technologies are available for diagnosis, the cost of specialised equipment may prove it impractical in places with heavy spread of diseases, he said.

"In contrast to alternatives such as rapid diagnostic tests, however, microscopy-based diagnosis does depend on the availability of skilled technicians, of which there is a critical shortage. As a result, diagnoses are often made on the basis of clinical signs and symptoms alone, which is error-prone and leads to higher mortality, drug resistance, and the economic burden of buying unnecessary drugs," the professor said.

The professor also added that there is a need for alternatives which can help in providing the access to quality diagnosis that is currently routinely unavailable.

The long-term impact and goal of this work is to enable potential future use of the platform in rural and resource-constrained areas and improve the access to diagnostic health-care.

#### **Awards given on the innovation**

The student researchers working on this project (Khushal Sethi, Narayani Bhatia, Vivek, and Shridu Verma) were awarded two Summer Undergraduate Research Awards (SURA) by IIT Delhi, in 2017 and 2018.

The work was showcased at Rashtrapati Bhawan and also received the prestigious Gandhian Young Technology Innovation Award (GYTI) in 2018.

**March 29**

**Charusita Chakravarty: The Chemist Who Fought Sexism in STEM | #IndianWomenInHistory**

<https://feminisminindia.com/2019/03/29/charusita-chakravarty-chemist-sexism/>

*This article is a part of the [#IndianWomenInHistory](#) campaign for Women's History Month to remember the untold legacies of women who shaped India, especially India's various feminist movements. One Indian woman is profiled each day for the whole of March 2019.*

At a time when it was hard to be taken seriously as a woman in the sciences, Dr Charusita Chakravarty made it her goal to excel in the field of chemistry. As a social crusader, she spoke out against the inhospitable environment for women in scientific arenas and encouraged many to pursue the subject despite the many hardships. She breached the unspoken dichotomy between the arts and sciences through her love for poetry and music, demonstrating that one does not have to restrict their interests to areas they work in.

### ***Early Life and Education***

Charusita Chakravarty was born on 5th May 1964 to her parents Sukhamoy and Lalita Chakravarty in Cambridge, Massachusetts, USA. The only child of two leading economists, Chakravarty grew up in a liberal environment that gave her the fire to break boundaries from an early age. She was exposed to a wide variety literature while growing up – so while she had a definitive partiality to science, and chemistry, in particular, she by no means restricted herself and her interests to purely scientific fields. In a day and age when the boundaries between arts and sciences were clearly drawn, she straddled an important intersection between the two, and demonstrated the value of both by simply taking pleasure in what each subject had to offer.

An early achiever, she topped the Delhi Higher Secondary Board before deciding to pursue B. Sc in Chemistry from *St. Stephens College*, leaving *Delhi University* as a gold medalist in 1985. She went on to pursue a Natural Science Tripos from *Cambridge* and graduated in 1987 before settling down to work on her PhD, also in *Cambridge*, on quantum scattering and spectroscopy under the guidance of David Clary. Charusita then became a Post Doctoral Scholar at the *University of California* at Santa Barbara, under Professor Horia Metiu. After a brief visit to India, she returned to Cambridge as a Gulbenkian junior research fellow in an independent post-Doctoral position.

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### ***Career***

After marrying fellow scientist Ram Ramaswamy, Charusita relocated to India in 1994. The IITs were reluctant to give her a job, despite her PhD, because she had not done a Masters. She was then offered a position by IIT Kanpur, in their Chemistry Department. She finally accepted a job from IIT Delhi in their Chemistry Department where rose from an Assistant Professor to Professor in 2006, where she continued to teach there till her death.

Chakravarty was an academic through and through and submitted her research proposal to the Department of Science and Technology in New Delhi soon after joining IIT Delhi. With one referee

calling it the best-written proposal he had ever seen, she managed to secure funding easily and carried on with her research even when funding became scarce. Her initial work had to do with atomic and molecular clusters and over the course of her career, she became famous for her specialised application of path integral Monte Carlo simulation to unravel quantum mechanical effects in the properties of atomic and molecular clusters.

Her fields of interest also included theoretical chemistry and chemical physics, the structure and dynamics of Liquids, water and hydration, nucleation and self-assembly. International and national journals have published her articles and she was widely known for her single-author papers, published extensively over the course of her career. A few of her famous co-written works include, *'Multiple Time-scale Behaviour of the Hydrogen Bond Network in Water'* (2004), *'Estimating the entropy of liquids from atom-atom radial distribution functions: silica, beryllium fluoride and water'* (2008), and *'Excess entropy scaling of transport properties in network-forming ionic melts'* (2011).



Chakravarty was known for speaking out against the dearth of women in science and openly discussed the double burden females faced. While men in their thirties only had to worry about their career, women had the additional task of balancing family life and their work commitments. She managed to do a stellar job managing both, and became an accomplished academician while embracing motherhood in 2000 when her daughter, Krithi, was born.

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## **Achievements**

Her work received widespread acclaim and she was the recipient of several prizes and honors. Chakravarty's earliest award came in 1996 when she received the *Medal for Young Scientists* from the *Indian National Science Academy* (INSA), a leading society for science and technology in India. From 1996 to 2003, she served as a member of the *Abdus Salam International Center* for Theoretical Physics, Trieste, Italy, an institute dedicated to scientific research and excellence. In 1999 she bagged two awards, the *B.M. Birla Science Award* and *Anil Kumar Bose Memorial Award* from the *Indian National Science Academy*. In 2003, she received the *Swarnajayanti Fellowship* from the Department of Science and Technology and in 2006 a Fellowship from *Indian Academy of Sciences*. She also received the prestigious *Shanti Swarup Bhatnagar Award* in 2009 and was an Associate Member of the *Centre for Computational Material Science, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore*.

## **Death and Legacy**

Unfortunately, we lost Dr Chakravarty too early, after a long and valiant fight against cancer. Despite the fact that she was diagnosed in 2013, she kept authoring and publishing articles up till her death, a testament to her indomitable will. She even received a Fellowship in 2015 from INSA, an insight to the brilliant mind she had right till the end. Charusita continued to take classes on days when she well enough and made it a point to make time for her friends and family, despite the side-effects of the treatments and the horrific pain. She passed away in 2016, at the age of fifty-one.

While we lost her too soon, she displayed a kind of genius that is hard to forget. Her work made her a brilliant academic and exemplary role model that prompted numerous women to cross the threshold and enter laboratories.

Her legacy lives on and her lasting impact on the scientific community is best elucidated by a Margaret Mead poem read at her funeral.

*To the living, I am gone  
To the sorrowful, I will never return  
To the angry, I was cheated  
But to the happy, I am at peace  
And to the faithful, I have never left  
I cannot be seen, but I can be heard  
So as you stand upon a shore, gazing at a beautiful sea- remember me  
As you look in awe at a mighty forest and its grand majesty – remember me  
As you look upon a flower and admire its simplicity – remember me  
Remember me in your heart, your thoughts, and your memories of the times we loved  
The times we cried, the times we fought, the times we laughed  
For if you always think of me, I will never be gone.*

## **Wipro gains after research collaboration with IIT Kharagpur**

[https://www.business-standard.com/article/news-cm/wipro-gains-after-research-collaboration-with-iit-kharagpur-119032900183\\_1.html](https://www.business-standard.com/article/news-cm/wipro-gains-after-research-collaboration-with-iit-kharagpur-119032900183_1.html)

Wipro rose 1.96% to Rs 259.60 at 9:23 IST on BSE after the company said it collaborated with IIT Kharagpur for advanced research in 5G and artificial intelligence.

The announcement was made after market hours yesterday, 28 March 2019.

Meanwhile, the S&P BSE Sensex was up 171.81 points, or 0.45% to 38,717.53.

On the BSE, 21,000 shares were traded in the counter so far compared with average daily volumes of 3.94 lakh shares in the past two weeks. The stock had hit a high of Rs 259.60 and a low of Rs 257 so far during the day. The stock hit a 52-week high of Rs 297 on 25 February 2019. The stock hit a 52-week low of Rs 190.13 on 6 June 2018.

Wipro and Indian Institute of Technology, Kharagpur (IIT Kharagpur) signed a memorandum of understanding (MoU) to collaborate on high-impact, industry-focused applied research in the areas of 5G and artificial intelligence (AI). Research outcomes from this partnership will be leveraged by Wipro to develop solutions for its customers, across industry verticals. IIT Kharagpur will benefit from the commercialization of the joint research insights and Wipro's real-world industry expertise.

Wipro and IIT Kharagpur will jointly take up applied research projects on industry challenges related to the design, planning and operations of 5G networks and cognitive information processing for the automation of these processes and 5G use cases. The two organizations will focus on AI research applicable in the healthcare, education and retail sectors as well as in domains such as climate change and cybersecurity. In addition, subject matter experts from Wipro and IIT Kharagpur will promote knowledge sharing through guest lectures, workshops and seminars on 5G and AI.

IIT Kharagpur is pursuing research projects in areas including front and back haul optical networks, vehicular ad hoc networks, interplanetary networks, channel estimation, optimized resource allocation, Multiple-Input & Multiple-Output (MIMO) and millimeter wave communications, secure communication & cross layer optimization and multimedia transmission for 5G. Student research groups are also working on Network Function Virtualization (NFV) and Software Defined Networking (SDN), which holds immense potential in 5G telecommunication. In addition, the institute is also working on foundational research in AI Algorithms, formal methods, machine learning, deep learning, graph mining and analytics, game theory and mechanism design.

On a consolidated basis, Wipro's net profit rose 32.89% to Rs 2510.40 crore on 3.57% rise in net sales to Rs 15059.50 crore in Q3 December 2018 over Q2 September 2018.

Wipro is a leading global information technology, consulting and business process services company.

## **HRD's NIRF ranking 2019 to release on April 8**

<https://indianexpress.com/article/education/nirf-ranking-2019-to-be-announced-on-april-8-5647399/>

NIRF ranking 2019: The sources confirmed the Indian Express, that the ranking will be released on Monday, April 8 by the President of India, Ram Nath Kovind

NIRF Ranking 2019: The Indian Institute of Science (IISc) Bengaluru was ranked as the best overall institution and university in India in 2018

NIRF ranking 2019: The National Institutional Ranking Framework (NIRF) India Rankings 2019 will be released on April 8. As per the sources, the ranking will be announced on Monday by the President of India, Ram Nath Kovind.

From 2016, colleges and universities in the country are ranked according to set criteria for different fields and courses. The rankings will be announced under nine categories – Overall, Universities, Engineering, Colleges, Management, Pharmacy, Medical, Architecture, and Law.

The ranking is done on the basis of teaching, learning and resources, research and professional practices, graduation outcomes, outreach and inclusivity, and perception.

Last year, the HRD Ministry released the ranking on April 3, 2018. Overall, the best institute was IISc and the Indian Institute of Technology, Madras (IIT-M) was adjudged the best engineering college while the Indian Institute of Management-Ahmedabad (IIM-A) the best management institution. Delhi University's Miranda House was the top college, premier healthcare institute AIIMS the best medical college and NLSIU-Bengaluru the best law school in the country.

### **NIRF ranking 2018: List of top 10 universities**

- 1) Indian Institute of Science, Bengaluru
- 2) Jawaharlal Nehru University (JNU), New Delhi
- 3) Banaras Hindu University (BHU), Varanasi
- 4) Anna University, Chennai
- 5) University of Hyderabad, Hyderabad
- 6) Jadavpur University, Kolkata
- 7) University of Delhi, Delhi
- 8) Amrita Vishwa Vidyapeetham, Coimbatore
- 9) Savitribai Phule Pune University, Pune
- 10) Aligarh Muslim University, Aligarh.



**March 28**

## **Gram Vaani helps Tamil Nadu garment workers air their grievances**

<https://economictimes.indiatimes.com/industry/cons-products/garments/-/textiles/gram-vaani-helps-tamil-nadu-garment-workers-air-their-grievances/articleshow/68591140.cms>

***A social technology company incubated at IIT Delhi has managed to bring forth steady and sustainable change in unregulated work environments.***

Every morning when the textile mill's van arrived in the village of Rani (name changed) and the number of workers was lower than necessary for the first shift, the 17-year-old knew she would be working overtime, unpaid, for another day. Much like Rani, workers in India's textile spinning capital, Dindigul, had to accept unpaid overtime work as a fact of life, with formal redressal mechanisms in their workplaces bringing no help. That, though, has changed now.

A social technology company incubated at IIT Delhi, with the help of labour unions in the textile hubs of Tamil Nadu, has managed to bring forth steady and sustainable change in such unregulated work environments in the last 18 months. The company, Gram Vaani, has been addressing the gap with its interactive voice response (IVR) technology, combined with free-to-air mobile radio stations in Chennai, Dindigul and a recently launched one in Tirupur — all hubs in the global textile and garment manufacturing supply chain. With the touch of a button, factory workers can access information from a rich, curated audio content library created with the help of labour union activists, legal and workforce management experts, on how to withdraw their provident fund saving, raise a sexual assault claim, or report the lack of adequate sanitation provisions and other such issues.

The company was started with the vision of reversing the flow of information from the bottom up — grassroots level to the top. In the case of overtime, unpaid work in Dindigul mills, Gram Vaani had received a number of calls and recorded complaints from labour activists and workers like Rani on its IVR platform.

Following this, the Tamil Nadu Spinning Mills Association addressed the prevalence of the issue and issued a circular to its 612 member mills. Since 2018, the managements of a number of those mills have committed in writing to fix the problem.

The Tirupur radio station has already notched up 1,500 regular users with 50-150 workers calling in every day, said Orlanda Ruthven, advisor, workforce programme, at Gram Vaani, who is responsible for the company's work in the southern region.

The other platforms have 100-300 callers daily and reach out to 1,000-2,000 users monthly, she said. "On each of the older platforms (Chennai and Dindigul), upwards of 30 individual activists and listeners (largely factory workers) make over 100 content contributions each month," added Ruthven.

The company has been using its technology to "largely function as a platform for enforcing existing laws and provisions, and to create awareness of worker entitlement," Ruthven said. The platform is also backed by the government in Dindigul as it works in conjunction with the district legal aid

facility. Thivya Rakini Sesuraj, president of the Tamil Nadu Textile and Common Labor Union, who works closely with Gram Vaani and factory workers to address grievances and bargain with factory managements, said: "The platform uses the latest technology and has a labour-friendly mechanism such that the confidentiality of the grievance maker is maintained. Also, a single issue raised by one or two workers on the radio have benefitted entire workforces in the past because of the common nature of the problem."

Furthermore, the radio stations don't just work as grievance reporting platforms, said Ruthven. Listeners also call in to touch upon the daily bulletin and listen to the contributions of other workers.

### **March 27**

#### **IIT Roorkee releases schedule of JEE Advanced 2019**

<https://www.thehansindia.com/hans/education-careers/iit-roorkee-releases-schedule-of-jee-advanced-2019-515711>

Indian Institute of Technology (IIT), Roorkee has released the Schedule of Joint Entrance Examination Advanced (JEE Advanced) 2019 on its official website. The examination date of JEE (Advanced) 2019 has been shifted to May 27, 2019 (Monday), due to the General Elections 2019.

"In view of the clash in the dates of JEE (Advanced) 2019 and the last phase of General Elections 2019, the examination date of JEE (Advanced) 2019 has been shifted to May 27, 2019 (Monday). The examination will be held in India and abroad, on May 27, 2019 (Monday), in the following two shifts: Paper 1 (09:00 to 12:00 IST) and Paper 2 (14:00 to 17:00 IST)," read the official notification.

The date of the admit card for the exam would also be updated on the official website. The candidates need to login to the official website to check and download the JEE (Advanced) admit card 2019.

As per the schedule, session 1 will be conducted on May 27, 2019, in the morning shift i.e., 9 am to 12 pm. Session 2 will be from 2 pm to 5 pm. The entire JEE (Advanced) 2019 Examination will be conducted in a fully computer-based test mode.

The candidates can check more details on the same from the official website of the exam.

#### **Consumers willing to pay Rs 12,500 more for energy efficient ACs: IIT Bombay research**

<https://www.moneycontrol.com/news/business/companies/consumers-willing-to-pay-rs-12500-more-for-energy-efficient-ac-s-iit-bombay-research-3712291.html>

**Air-conditioners with a higher 'star' rating are more preferred by the customers**



Indian consumers are willing to pay up to Rs 12,500 more for air-conditioners that are energy efficient. According to research by Indian Institute of Technology (IIT) Bombay, consumers prefer air conditioners that have better star ratings even if they are more expensive.

In 2006, the government initiated a system of adding 'star labels' on appliances that provide information on their energy efficiency. Initially voluntary, star labels are now mandatory for a few appliances like room air conditioners and frost-free refrigerators.

As per a report from the Ministry of Statistics and Program Implementation, households in India consume about 22 percent of electricity. Air conditioners, one of the most energy-intensive appliances, are increasingly becoming common and could impact electricity consumption in a big way.

Star labels, ranging from one star (least energy efficient) to five stars (most energy efficient), are aimed at enabling customers to compare different products and make an informed choice.

In this study, researchers from the Centre for Technology Alternatives for Rural Areas and Interdisciplinary Program in Climate Studies, IIT Bombay, led by professor Anand B Rao, used statistical tools to analyse what consumers preferred while choosing a 1.5-ton split air conditioner.

The researchers analysed 1,184 observations from 148 individuals, as each respondent gave eight different preferences in hypothetical purchase situations. They estimated consumer preference for different attributes of ACs such as brand, air filter, noise level and star rating.

"This shows that due to the standards and labelling program, the adoption of energy efficient ACs is market-driven and may not require any further government intervention apart from strengthening the standards," say the authors of the study.

The IIT-B study also found that 70 percent of the people surveyed were aware of star labels and 48 percent believed higher star rated devices consume lesser electricity. Though customer preference varied with star rating levels, it was seen that 69 percent preferred an air conditioner rated 3-star

over one with a 2-star rating, and 78 percent preferred a 5-star rated air conditioner over a 2-star rated one.

In addition, 85 percent of the respondents preferred the presence of a star label on the ACs. Using statistical models, the study found that customers were willing to pay up to Rs 12,500 more for air conditioners with star labels, an amount significantly higher than what they would pay for the presence of a brand name (Rs 9,000).

Also, 62 percent of the consumers were willing to pay for the increment in star rating level from 3 to 5. The study concluded that such investment would be economically beneficial if the household's monthly consumption of electricity is greater than 100 kWh, as the savings would be greater than the estimated cost incurred for more efficiency.

Extending this study further, the researchers plan to explore the relationship of rating preferences with household income, education, and other attributes to help design targeted programmes for increasing energy efficiency.

### **IIT Madras Students Build Robot to Clean Sewage Tanks, and Save Lives of Sewage Cleaners**

<https://www.indiatimes.com/technology/science-and-future/iit-madras-students-build-robot-to-clean-sewage-tanks-and-save-lives-of-sewage-cleaners-364386.html>

Cleaning sewer lines and manholes is a much more dangerous job in India than most other countries in the world.

That's because we don't have any efficient ways to do this, but instead rely on human workers manually cleaning out waste in dangerous situations.



It's estimated that around 8,00,000 people from lower-income groups are employed as sewage cleaners, and approximately 23,000 of them die every year. These labourers are sent into sewage lines with no safety gear, causing them to eventually perish due to asphyxiation, or complications from the poisonous gases present.

Now, a group of students from IIT-Madras are hoping to save the lives of these workers by automating the process. Called the 'SEPOy Septic Tank Robot', it will undergo lab trials starting next month, with trials in real sewers scheduled for July. If the robot is indeed successful, perhaps it'll even be adopted for use by state governments.

### **Two students win laurels in international events**

<https://www.tribuneindia.com/news/himachal/two-students-win-laurels-in-international-events/748873.html>



TWO students of the biotechnology department at Dr YS Parmar University of Horticulture and Forestry, Nauni (Solan) won prizes in two international conferences held at Guwahati recently. Vishal Sharma, a doctoral student, bagged the 'Best Interactive Poster' prize during an international conference on "Next generation plant production and bio-resources utilisation technologies" organised by the International Plant Propagation Society and IIT-Guwahati. His research topic was 'An efficient method of in-vitro propagation and hardening of plum (*Prunus salicina*)'. The research was carried out under the DBT-funded project "Biotechnological interventions for the establishment of own-rooted progeny orchard of stone fruits".

Another student, Dr Arjun Chauhan, who is working as a project assistant at the university, bagged the 'Best Poster' prize during an international conference on "Trends in plant sciences and agro-biotechnology- 2019". It was organised by the Plant Tissue Culture Association on the campus of IIT-Guwahati. The research title was 'Double standard RNA-based management of leaf blotch disease caused by *Marssonina Coronaria* in apple- a novel RNA interference approach".

### **Three-day exchange programme ends**

A three-day educational exchange programme for students of Dayalbagh Educational Institute, Agra, concluded here recently. As many as 43 students of BSc (agriculture), BVoc (agri tech) and BVoc (greenhouse technology) visited the university. During the tour, the students were apprised about various activities and agricultural and horticultural practices followed by state farmers. The students also visited the dry flower laboratory, hi-tech floriculture farm, kiwi orchards and also interacted with scientists and experts of the university. Dr Rakesh Gupta, Dean, College of Horticulture, said such exchange programmes were essential for the overall development of the students.

### **Dhaulakuan centre gets national recognition**

The Regional Horticulture Research and Training Station (RHRTS), Dhaulakuan, has been designated as the 'Lead Centre of Dahlia Testing' in the country. The Protection of Plant Varieties and Farmers' Rights Authority (PPV&FRA) of the Department of Agriculture, Cooperation and Farmers' Welfare has bestowed this national-level designation to the research station. This will boost dahlia cultivation in the state as the flower has been introduced here for the first time under the project. The research conducted at the station could pave the way for its adoption by farmers for commercial cultivation.

#### **Bi-monthly meeting on horticulture**

The sixth bi-monthly meeting of the District Development Managers (DDMs) of National Bank for Agriculture and Rural Development (NABARD) was held on the university campus. The Punjab regional office of the bank in association with the Directorate of Extension Education of the university organised the meeting. As many as 25 DDMs from Punjab attended the two-day meeting and learnt about the possibilities of horticulture in their state. The meeting is part of the bank's initiative to expose their officials to the advancements and opportunities in horticulture and allied disciplines so that they could promote the schemes associated with it among the farmers. Dr Hari Sharma, Vice-Chancellor; Dr Vijay Singh Thakur, Director, Extension Education; JPS Bindra, CGM, Mithleshwar Jha, DGM, along with university scientists, attended the inaugural session of the meeting.

#### **More nitrogen may help offset effect of climate change on wheat: study**

<https://www.downtoearth.org.in/news/agriculture/more-nitrogen-may-help-offset-effect-of-climate-change-on-wheat-study-63721>

IIT-Kharagpur scientists find wheat yield improves with increasing levels of nitrogen application despite elevated CO2 conditions

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Increasing concentration of carbon dioxide and the associated rise in temperatures is affecting life on earth at different scales. Agricultural scientists are worried over sustaining food production and productivity of major crops like wheat, paddy, and maize. Over the years, studies have shown that elevated carbon dioxide levels will stimulate wheat productivity but the consequent rise in temperatures would have a negative impact.

The possibility of a hike in wheat productivity because of higher concentration of carbon dioxide has, in fact, led to some optimism in temperate countries like Greenland, Canada, Northern China and Europe since annual temperatures there are currently well below the optimum range for the growth of wheat. Any increase in temperature would be beneficial to them. In tropical countries like India, however, there is heightened concern. It is already hot enough and further rise in temperature could prove disastrous.

In this backdrop, scientists at Indian Institute of Technology-Kharagpur explored the possibility of nutrient management as a way to sustain wheat productivity even at higher concentrations of carbon dioxide. They created an artificial carbon dioxide-rich environment and applied different levels of nitrogen to wheat crop along with the recommended dosage of fertilisers. The experiment was carried out over three consecutive Rabi seasons.

The scientists found that wheat yield and growth parameters improved with increasing levels of nitrogen application despite elevated carbon dioxide conditions and higher temperatures. Interestingly, under ambient carbon dioxide concentration, increasing the dosage of nitrogen did not bring any improvement in growth and yield of the crop.

Carbon dioxide enrichment had a positive effect on various growth parameters and yield attributes of wheat. Elevated carbon dioxide tended to increase crop growth rate and the fraction of leaf biomass and leaf nitrogen, especially for the nitrogen management using chemical fertilizer. Elevated carbon dioxide led to 17 per cent increase in wheat grain yield above ambient as averaged over the nitrogen fertilized treatments. Elevated carbon dioxide also resulted in higher nitrogen use efficiency.

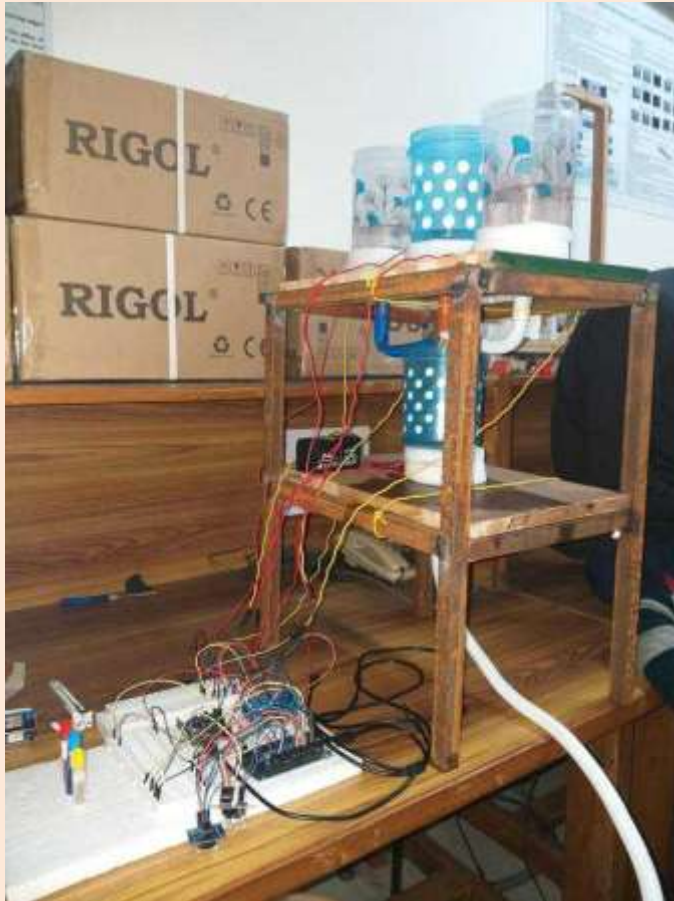
“Wheat production under the elevated carbon dioxide environment in Eastern India might be maintained or improved through the normal and increased dose of nitrogen fertilizer application. However, there is need for larger studies on the field with multi-location trials using different varieties, before any firm conclusion can be reached,” said Dillip Kumar Swain, who led the study.

The researchers have published their findings in the European Journal of Agronomy. Besides Dr. Swain, the team included Swati Hazra and Pratap Bhanu Singh Bhadoria from the Agricultural and Food Engineering Department of IIT Kharagpur, India.

**March 26**

**IIT-Ropar develops automatic irrigation, fertilisation system**

<https://www.tribuneindia.com/news/chandigarh/iit-ropar-develops-automatic-irrigation-fertilisation-system/748815.html>



A prototype of the automatic irrigation and fertilisation system.

Mahendra Sakare, assistant prof at the IIT-Ropar, along with a team of students, has developed an automatic irrigation and fertilisation system in fields. This will help farmers save water and reduce the cost of production substantially.

Sakare said trials of the system developed by a team of students comprising Nikhil Jain, Nitin Yadav, Jitesh Kumar, Mrityunjay Kumar, Mohit Kumar and Shreyansh Shrivastava from the Department of Electrical Engineering had been completed successfully and more features were being incorporated into it.

Traditional agricultural methods cause excessive wastage of water and fertilisers and using them in large amount lead to degradation of both soil and crop quality.

The internet of things (IOT) based system sprinkles only the required amount of water into the soil. It keeps track of soil's moisture content and stops water flow when the desired level of moisture level is reached for crop's proper growth.

It also measures content of various nutrients such as nitrogen, phosphorus and potassium in the soil before preparing a solution containing these nutrients in the required amount to fulfill the deficiency of these nutrients in the ground for the proper growth of any particular crop. This fertiliser solution is then sprinkled into the soil.



Sakare said a farmer could control irrigation and fertilisation of fields while sitting at a far-off place. Also, wastage of water and fertilisers will be reduced to a large extent. The initial investment in the system would cost below Rs 10,000, hence, even a small farmer could afford it, he added.

## **March 25**

### **IIT Mandi professor gets 'Young Scientist Award' by URSI for contribution to radio science and stealth technology**

<https://www.indiatoday.in/education-today/news/story/iit-mandi-assistant-professor-gets-young-scientist-award-by-ursi-for-contribution-to-radio-science-and-stealth-technology-1486055-2019-03-25>

*Dr G Shrikanth Reddy, an assistant professor at IIT Mandi received the 'Young Scientist Award' for his contribution to Radio Science in a project on communication and stealth technologies funded by the Department of Science and Technology, Govt of India.*



Dr. G. Shrikanth Reddy, Assistant Professor, School of Computing and Electrical Engineering, IIT Mandi, received the Young Scientist Award for his work in radio science and stealth technology.

Dr G Shrikanth Reddy, Assistant Professor in the School of Computing and Electrical Engineering at the Indian Institute of Technology (IIT), Mandi, has been awarded 'The International Union of Radio Science (URSI) - Young Scientist Award 2019' for his substantial contribution to the field of radio science.

Reddy was presented with the award by the URSI Society during the 2019 URSI Asia Pacific Radio Science Conference (APRASC-2019), held on March 13, 2019, at New Delhi.

Along with Dr Reddy, 20 other researchers, across the Asia Pacific Region and beyond were awarded the YSA at APRASC-2019. This year's event in New Delhi, India attracted many international speakers and technical experts from the area of Radio Science and Wave Propagation.

#### **Who is the URSI Young Scientist Award given to?**

The Young Scientist Award (YSA) is awarded to scientists/ researchers who are less than 35 years of age and have contributed substantially in the area of Electromagnetic Waves and Propagation.

"I am honored to receive this prestigious award. Such awards will motivate young researchers to work in the area of Radio Science and Electromagnetism," said Dr G Shrikanth Reddy, speaking about this recognition.

"Since these are the days where high speed communication and robust connectivity are in great demand, I believe conferences like URSI AP-RASC will bridge the connectivity between cutting edge technology and the society," Reddy added.



Dr. G. Shrikanth Reddy of IIT Mandi (2nd from Left) receiving the URSI - Young Scientist Award 2019 in New Delhi

Range of works by Dr Reddy which earned him the Young Scientist Award

The YSA recognizes Dr. Reddy's past and current academic and research work in **field of Radio Frequency (RF), Microwave Antennas and Passive Component Design.**

In the year 2012, while pursuing his PhD at IIT Bombay, Dr G Shrikanth started his **research on 'MIMO (Multi Input, Multi Output) Antennas and Integrated Filters'** which has an end application in all communication networks.

Further, in 2014, Dr G Shrikanth **visited the University Pierre and Marie Curie (UPMC) in France for a period of six months as a Raman-Charpak Fellow** where he largely studied about, 'How microwave propagates within human tissues'.

In the future, this study may help in Body Area Network (BAN) communication where doctors can seek information about the patient's medical condition without being physically present with the patient.

In 2016, under a **postdoctoral fellowship at State University New York (Oswego campus)**, Dr G Shrikanth worked on 'Covert Vehicular Antenna', and **designed hidden antennas for vehicular applications.**

In 2017, Dr G Shrikanth Reddy started working on '**Design of Broadband Frequency Selective Structures (FSS) for Radio Frequency (RF) and Microwave Applications**'. This research has a potential application in communication and stealth technology.

This project is awarded to Dr Reddy as an Early Career Research Grant Award (ECRA) with a **funding of Rs 51.97 lakh from the Department of Science and Technology (DST), Government of India, for a period of three years.**

For research in the area of civilian application of FSS, Dr Reddy is collaborating with Dr Shiv Narayan from Center for Electromagnetics (CEM) at National Aerospace Laboratory (NAL), Bengaluru. They are also jointly supervising one PhD student at IIT Mandi.

#### **About The International Union of Radio Science (URSI)**

Radio science encompasses the knowledge and study of all aspects of electromagnetic fields and waves. The International Union of Radio Science (Union Radio-Scientifique Internationale), a non-governmental and non-profit organisation under the International Council for Science, is responsible for stimulating and co-ordinating, on an international basis, studies, research, applications, scientific exchange, and communication in the fields of radio science.

#### **IIT Bombay Announces M.Tech Programme in Educational Technology**

<https://www.ndtv.com/education/iit-bombay-announces-m-tech-programme-in-educational-technology-2012332>

The IIT Bombay ET programme will screen learners from diverse background with serious and core interest in improving learning and teaching using technology.

Educational Technology (ET) is an interdisciplinary field, which lends itself to collaboration with researchers from varied disciplines to develop technologies supporting existing educational practices as well as to create technology-enhanced learning. With its PhD programme well established since 2010, the Interdisciplinary Programme (IDP) in Educational Technology or ET at IIT Bombay has announced the launch of a new M.Tech degree program, and will welcome their first Masters students in the Fall of 2019.

According to a statement from the Institute, the programme will screen learners from diverse background with serious and core interest in improving learning and teaching using technology.

The broad objective of the M.Tech programme is to build specialized ET workforce with student expertise in theories of learning and pedagogy; analysis, design, effective implementation and

evaluation of learning environments; instructional design; research methodologies; translating research into practice; and working collaboratively on complex interdisciplinary projects.

IIT Bombay is one of the few premier institutes in the country with a strong ET programme, working towards improving teaching and learning in education.

Explaining the role of his department, Prof. Sridhar Iyer, Head of the Department at ET shared, "With a strong interdisciplinary focus, our Department contributes towards developing innovative research-based solutions for improving student learning and engagement. We emphasize on learning of abstract thinking skills, creation of large-scale blended and online learning programs, development of emerging technologies for education, and learning analytics; all grounded in theories of learning sciences."

The 2-year programme will constitute course work, covering some integral areas of study such as emerging educational technologies, research methods & statistics, designing learning environments, adaptive learning; an 8-week long summer field work for a holistic perspective of various disciplines involved in the domain, and understand their interplay through practical experience and a project work.

"Through our M.Tech program, we hope to contribute towards meeting the escalated need of qualified ET experts in research labs, curriculum design roles in schools/ colleges, industries for creating educational applications, training departments for online and remote trainings, and content creator industries for creation of technology-enhanced learning material and field implementation works," shared Prof. Iyer.

### **IIT-H's new game based therapy to aid stroke victims**

[https://www.business-standard.com/article/news-ians/iit-h-s-new-game-based-therapy-to-aid-stroke-victims-119032500733\\_1.html](https://www.business-standard.com/article/news-ians/iit-h-s-new-game-based-therapy-to-aid-stroke-victims-119032500733_1.html)

The Indian Institute of Technology-Hyderabad's (IIT-H) incubated start-up has developed a "gamified arm rehabilitation" device that would aid in brain and motor rehabilitation of stroke victims.

BeAble Health start-up's 'ArmAble' is affordable, offers engaging game-based therapy, has data-based quantified progress and recovery and can also be used for tele-rehabilitation.

Aimed at targeting conditions such as cerebral palsy, multiple sclerosis, traumatic brain injury, fracture and frozen shoulder, it can solve the pressing need for intensive, engaging and regular rehabilitation therapy for the upper limb, the institute said in a statement on Monday.

The device motivates the patients to engage in therapy using the immersive games which lead to an increased number of repetition. The high number of repetitions augment the recovery of the arm function.

The tele-rehabilitation in ArmAble connects a therapist to patients by remotely connecting through a cloud platform. The therapist can monitor and analyze the progress of their patient's recovery by looking at the movement data such as patterns, speed, accuracy etc.

ArmAble was unveiled recently during the Seventh Foundation Day celebrations of the Biotechnology Industry Research Assistance Council (BIRAC) at Delhi.

BeAble Health works towards enabling health and lives through the convergence of good design and technology.

It is a spinoff from the first batch of Fellowship in Healthcare Entrepreneurship at the Centre for Healthcare Entrepreneurship (CfHE) at IIT Hyderabad.

### **Indore: Researchers develop devices for harvesting energy from flag flutter**

<https://www.freepressjournal.in/indore/indore-researchers-develop-devices-for-harvesting-energy-from-flag-flutter/1488977>



The researchers at Indian Institute of Technology Indore have fabricated small flag based piezoelectric energy harvesting devices, which can be powered by wind at low velocity. Piezoelectricity is the property of materials to produce charge (or voltage) when stimulated by a mechanical strain. The all-pervasive vibrations existing in the surroundings from various machines are traditional source strain, which can be converted to energy through piezoelectric crystals.

“The need to regulate usage of lead-based piezoelectric, there is a need to replace it with highly biocompatible and high performance devices. Also, implementation of such energy harvesting devices in real time requires them to be of low impedance,” IIT Indore media coordinator Rahul Sharma said. “To achieve high productivity of such devices, improving flexibility and inducing flow instability are some of critical parameters. Dr Palani’s and Dr Vipul Singh’s research group at IIT Indore have fabricated an ultra-flexible lead-free piezoelectric device using bio-compatible material,” he added.

The knowledge of aerodynamics of flow around the structure can be of significant advantage to increase fluttering capacity. These forces are not desirable for structures like bridges and towers conversely we use these forces for development of efficient energy source. The detaching of discrete vortices behind a bluff-body immersed in stream is known to generate transverse periodic forces on the structure. The piezoelectric output is directly proportional to the strain produced.

“The fabricated ultra-flexible flag based flutter piezoelectric composite device has been tested under three different flow regimes. It can be used in place where windmill becomes inefficient. Hence, this

technology can be used in powering small scale devices,” a press release issued by IIT Indore stated. The device stability was ascertained for more than 4500 cycles and found to be stable.

## **March 23**

### **Urban areas are cooler than non-urban areas during heat waves**

<https://www.thehindu.com/sci-tech/energy-and-environment/urban-areas-are-cooler-than-non-urban-areas-during-heat-waves/article26621571.ece>



Study by IIT-Gandhinagar team suggests that the lack of vegetation cover in summer after crops are harvested in rural areas may be the cause

A study of 89 urban areas in India has found that though there is an absolute increase in temperature during heat waves in both urban and non-urban areas, the urban areas are relatively cooler than the surrounding non-urban areas. At 1.94°C, the absolute increase in temperature during the day in non-urban areas during a heat wave was significantly higher than in urban areas (0.14°C).

According to the analysis, urban areas were found to be relatively cooler than the surrounding non-urban areas during heat waves. At 44.5°C, the non-urban areas were warmer than urban areas (43.7°C). However, during the night, all urban areas were hotter than the surrounding non-urban areas.

“This result was quite unexpected. Though our earlier study showed that compared with non-urban areas the urban areas experience day time cool island effect, we hypothesised that this might not be the case during heat waves. But the results of our study showed otherwise,” said Prof. Vimal Mishra, from the Department of Civil Engineering at IIT Gandhinagar, who led the study. “Our study has implications for urban planning in India.”

The study was published in the journal Environmental Research Communications.

According to Prof. Mishra, the urban areas witness less temperature increase during heat waves compared with non-urban areas due to significantly higher tree cover and more number of water bodies.

In contrast, a majority of non-urban areas are located in agriculture-dominated regions. In non-urban areas, the vegetation cover in the form of crops and soil moisture from cropland irrigation decline sharply after crops are harvested and well before the onset of heat waves during summer.

The urban areas, on the other hand, have perennial vegetation in the form of tree cover and lawns, and more number of water bodies, which help in keeping the urban areas relatively cooler than non-urban areas.

The land surface temperature was estimated by analysing satellite data collected between 2003 and 2016. Between 1951 and 2016, a majority of urban areas experienced about five hot days and nights per year.

About 44% of urban areas showed an increase in frequency of hot days while 34% showed a significant decline in frequency of hot days.

Between 1951 and 1980, the frequency of hot days in urban areas located in the Indo-Gangetic plain region was more than in urban areas lying outside this region.

But post-1980, the urban areas in the Indo-Gangetic plain region witnessed a decline in the frequency of hot days and hot nights. The decline in the frequency is due to intensive irrigation in the Indo-Gangetic plain.

### **Academicians question cutting training for HRDC courses**

<https://timesofindia.indiatimes.com/city/trichy/ugc-cut-in-refresher-course-period-for-college-teachers-draws-criticism/articleshow/68530090.cms>



The University Grants Commission's (UGC) decision to reduce the number of days for orientation and refresher courses offered by the human resource development centre (HRDC) across the country has not been received well by many college teachers.

The new draft guideline released by UGC on Tuesday suggested reducing the 28-day long refresher course to 18 days and 21-day refresher course to 14 days. The UGC has sought opinion from stake holders to approve the guidelines.

The human resource development centre has to plan, organize, implement, monitor and evaluate induction and orientation programmes for newly appointed college and university lecturers within the jurisdiction of one or more universities in a state.

There are 66 human resource development centres in the country of which four are in Tamil Nadu, offering periodic courses for young teachers that are mandatory for career advancement.