



NEWS CLIPS

April 6-12, 2019

Highlights of the Week@IITD

IIT-Delhi looking to incubate ideas, start-ups in deep learning: Here's how to apply

<https://indianexpress.com/article/jobs/iit-delhi-looking-to-incubate-ideas-startups-in-deep-learning-heres-how-to-apply-5660528/>

Selected candidates will get lodging for two years, funding support up to Rs 50 lakh to develop proof of Concept (PoC), technical and business support and access to investors and entrepreneurship support programs. Applications closing on April 30, 2019.

The Indian Institute of Technology (IIT), Delhi has invited applications from innovators or start-ups working in deep technology domains for admission to Platform for Harnessing Deep technologies (PHD) incubation programme. The institute will support emerging futuristic technologies including connected intelligent systems (CIS), mixed reality, advanced materials, nanorobotics, drugs and vaccines; drug delivery systems) requiring advanced research and development.

Selected candidates will get support in the form of infrastructure, mentorship and funding. The programme is inclusive and open to qualified people outside of the IIT system as well. Selected candidates will get lodging for two years, funding support up to Rs 50 lakh to develop Proof of Concept (PoC), technical and business support and access to investors and entrepreneurship support programs.

Director, IIT-Delhi, Ramgopal Rao, said: "It is time to take the innovation ecosystem in the country to the next level and raise the bar for everyone. If you have a great idea in deep tech space, IIT-D will take care of the rest. The PHD Incubator Program provides comprehensive support for converting your idea into a startup, including a fellowship and accommodation to the budding entrepreneur as well as funds for the development of proof of concept".

The program is based out of IIT Delhi's TechnoPark at the Sonipat Campus.

Now, an App to help you decide the best telecom service provider in your area

April 11, 2019 <https://economictimes.indiatimes.com/small-biz/startups/newsbuzz/now-an-app-to-help-you-decide-the-best-telecom-service-provider-in-your-area/articleshow/68827000.cms>

Quality of Service and making an informed choice', reveals that the QoS obtained by users differs considerably from advertised values by telecom providers, and from values reported by them to the TRAI.

"The experiments conducted show that throughputs achieved by both 2G and 3G networks are significantly lower than their advertised rates. Further, the network availability at rural locations is remarkably lower than expected", said the reports.

As per the researchers, in such a scenario, the discontented consumers should be able to switch to another service provider, offering competitive prices and best QoS. "However, the ability of consumers to make rational and informed decisions in this regard is constrained by several factors. Disclosure of performance-related information by providers in a format which can be understood by consumers remains a major challenge, the report further added.

April12

Researchers at IIT Mandi Developed High Energy Supercapacitors from Hydrophobic Carbon Materials

<https://jobs.siliconindia.com/career-news/Researchers-at-IIT-Mandi-Developed-High-Energy-Supercapacitors-from-Hydrophobic-Carbon-Materials-nid-207650.html>



Researchers from the Indian Institute of Technology (IIT) Mandi have recently developed aligned carbon nanotube-based electrodes that could enable high energy supercapacitors. The research papers by Dr. Viswanath Balakrishnan and his research scholar, Piyush Avasthi has been published in Advanced Materials Interfaces and ACS Applied Nanomaterials.

Supercapacitors can charge and discharge instantly and can ideally last across millions of charge-discharge cycles without performance degradation. They also have a higher power density than batteries. But, where they have fallen short so far, is in the area of energy density. Supercapacitors have forty times less ability to store energy than the state-of-art lithium-ion battery. Carbon nanotubes are tiny tubes of carbon, a hundred thousand times thinner than the human hair. These materials, when used as electrodes, have the potential to considerably increase the energy density of supercapacitors. But typically high surface area carbon nanotube and fibres are hydrophobic, which means they cannot be 'wetted' by the electrolyte.

Piyush Avasthi, Research Scholar, Indian Institute of Technology Mandi, used a process called Chemical Vapor Deposition to produce 'forests' of vertically aligned carbon nanotubes that are wettable (hydrophilic) by the electrolyte. The perfectly aligned nanotubes, that were a few micrometres in height, were grown on a stainless-steel mesh and treated with two different ways to enhance their hydrophilic properties – in one, the forests were treated with potassium hydroxide (KOH), and in the other, they were coated with an ultrathin layer of titanium dioxide (titania), which made the nanotubes superhydrophilic. While KOH treatment resulted in better energy density than randomly oriented carbon nanotubes, treating with titania resulted in a 102-fold increase in energy density, 20-fold increase in specific capacitance, and 13-fold increase in power density. With that kind of improvement, supercapacitors can certainly give lithium-ion batteries a run for their voltage.

"A promising route to improving the performance of energy storage devices, especially in terms of cycling life and charging times, is to move away from batteries towards supercapacitors," says Dr. Viswanath Balakrishnan, Associate Professor, School of Engineering, Indian Institute of Technology Mandi.

TMC approaches IIT-Bombay to study crucial Thane bridges

<https://timesofindia.indiatimes.com/city/thane/tmc-approaches-iit-b-to-study-crucial-city-bridges/articleshow/68839187.cms>

Two days after a part of the Kopri flyover collapsed on the railway tracks, the Thane Municipal Corporation (TMC) has approached the IIT Bombay to examine the stability of the first SATIS bridge in the city.

A senior engineer from the TMC confirmed that a panel from the institute have been approached to conduct a study on the stability of bridges including the Satis bridge, the Kalwa creek and Mumbra station flyovers. Already, a stability study of all bridges in the lake city has been undertaken in the city and adequate repair works have been commissioned.

"We have approached the Bombay IIT engineers to conduct a structural stability of three crucial bridges in the city. The bridges are in good condition but we have still decided to undertake a study as some of these structures are nearly a decade old and witness severe wear and tear," informed an official from the public works department of the Thane corporation.

The bridges witness huge traffic on a daily basis and officials claimed it could be likely that they would have witnessed wear and tear. They claimed that though there have been no visual defects observed at these structures, the administration wants to be doubly sure about their stability.

Meanwhile, local residents complained the authorities have been neglecting upkeep of the bridge that is a crucial link between Thane and Mumbai. Few also lamented that the ongoing work at the Kopri bridge for the widening could also have led to loosening of the plaster on the bridge.

"There is lot of activity including drilling going on at either ends of the bridge to accommodate the widening of the stretch. The engineers should also explore if the tremors of these works including those from the movement of the passing trains below could have weakened the structure. A

complete audit of the structure should be done before there is a major tragedy,” said Ramesh Jadhav, a resident of Kopri.

The traffic department on its part said they have not received any communication from the railways or the MMRDA. The officials suggested the concerned teams should undertake immediate repairs of the stretch else it will cause congestion for Thane residents who will have nothing other than the LBS road to access Mumbai.

When contacted, the MMRDA claimed that their work is being undertaken away from the stretch of the bridge which is under the purview of the railways. “We have taken all precautions while undertaking the scope of work under our ambit,” said a senior official refusing to be named.

Central Railways also said they have started work on repair of the structure and are monitoring its daily health.

April11

IITs, JNU collaborate with German universities for first programme on Bio Big Data Science

<https://indianexpress.com/article/education/iits-jnu-collaborate-with-german-universities-for-first-programme-on-bio-big-data-science-5668481/>

The Research Training Group will set up 50 PhD projects, which will be supervised by scientists from both India and Germany. The first funding of the program will begin with an investment of €3 million from each of the two organizing partners - Heidelberg University and DBT.

Six leading Indian institutes are collaborating to establish the first Joint Indian-German Research Training Group (RTG) on Bio Big Data Science to promote the use of big data methods in biological applications. The programme aims towards educating the next generation of young researchers in the field.

The institutes include the Indian Institute of Technology (IIT) Guwahati, IIT-Kanpur, IIT-Madras, University of Allahabad, University of Delhi and Jawaharlal Nehru University (JNU). They are partnering with Heidelberg University, Germany, and Department of Biotechnology (DBT), Ministry of Science and Technology, Govt. of India.

The research training group will set up as many as 50 PhD projects, which will be supervised by research tandems consisting of leading Indian and German scientists. The first funding of the programme will be between 2019 and 2025 with an investment of €3 Million from each of the two organising partners (Heidelberg University and DBT).

The program organised its first summer school at Allahabad University, Prayagraj, Uttar Pradesh, from April 1-5, 2019. Participating scientists gathered to train postgraduate students on topics ranging from bio-molecular modelling to visualisation of large data frames. During this event, the partners will sign the bilateral MoUs, which will officially mark the beginning of the cooperation.

Parallel to the summer school a networking workshop was held to foster the formation of research tandems and the definition of new research projects.

IIT Bhubaneswar partners with AOTS Japan

<https://www.theindianwire.com/education/iit-bhubaneswar-partners-with-aots-japan-118817/>



Indian Institute of Technology, Bhubaneswar

IIT Bhubaneswar has just released on its website that the institute is going to partner with Association for Overseas Technical Co-operation and Sustainable Partnership (AOTS), Japan.

About AOTS

It is an organisation for human resources development that promotes technical co-operation through training, experts dispatch and other programs. The AOTS is established under the Japanese Government, Ministry of Economy, Trade and Industry (METI). It currently functions as their policy implementation organisations in the field of Industry and HR Development in developing countries as well as implements some self-sustainable-social business based projects in co-operation with Japanese companies.

Partnership

Prof. R.V Rajakumar, Director, IIT BBS stated the benefits of this partnership:

The partnership will have a strong focus towards professional development of students, creation of multiple academic and business opportunities including events to promote education, internship and employment for students.

The synergies are going to be greatly beneficial for both the nations for their new technological developments, which will be of paramount importance.

IIT Bhubaneswar will also explore collaboration in areas like Robotics, Augmented and Virtual Reality, Energy Climate Change and other areas.

Prominent personalities present at the discussion were:

Prof. R.K Panda, Dean (R&D) and Head of School of Infrastructure

Prof. Sujit Roy, Head of School of Minerals, Metallurgical and Materials engineering

Prof. Swarup Kumar Mahapatra, Dean (Continuing Education, Alumni Affairs and International Relations)

Dr. Sandeep Pattnaik, Head of School of Earth, Ocean and Climate Sciences

Dr. Arun Kumar Pradhan, Head of career Development Cell, IIT Bhubaneswar

April 10

INDIA'S TOP INSTITUTES: Government's NIRF Rankings For Universities, Engineering, Colleges, Innovation And MBA Schools Out.

<https://www.republicworld.com/india-news/education/indias-top-institutes-governments-nirf-rankings-for-universities-engineering-colleges-innovation-and-mba-schools-out-read-here>

- IIT-Madras has topped the overall institutions' list in the National Institutional Ranking Framework (NIRF) 2019, overtaking IISc Bangalore for the first time.
- The Atal Ranking of Institutions on Innovation achievements (ARIIA) introduced this year, too IIT-Madras topping the list followed by IIT-B

In a major boost to Maharashtra Board of Education, Mumbai University was ranked 81 in the National Institutional Ranking Framework (NIRF) released by the Ministry of Human Resource Development (MHRD) on Monday. This was the first time that the University had cracked into India's top 100 universities. In the overall institutions' category, Mumbai University was ranked in the 101-150 bracket.

The NIRF is an initiative by the MHRD launched in 2015, is the only national ranking framework for institutes and universities in India to rank educational institutes across the country mainly based on teaching standards, research work, placements, and outreach programmes.

TOP INSTITUTIONS OVERALL:

Topping the overall institutions' list, for the first time is IIT-Madras, overtaking last year's top-ranked institution IISc-Bangalore- which was ranked second this year. IIT-Delhi, IIT-Bombay and IIT-Kharagpur followed IISc, securing rank 3, 4 and 5 respectively.

Mumbai institutions like Institute of Chemical Technology (ICT), jumped three positions to 27 in overall rankings. While, Homi Bhabha National Institute jumped from last year's rank 41 to 30, this year. TISS dropped from 49 last year to 56. NMIMS and National Institute of Industrial Engineering (NITIE) managed to retain last year's rank. With Mumbai University's addition, total city institutes in the Top 200 in the overall category have risen to seven this year from last year's six.

Here are the top 10 institutions:

1. Indian Institute of Technology Madras
2. Indian Institute of Science
3. Indian Institute of Technology Delhi
4. Indian Institute of Technology Bombay
5. Indian Institute of Technology Kharagpur
6. Indian Institute of Technology Kanpur
7. Jawaharlal Nehru University
8. Indian Institute of Technology Roorkee
9. Indian Institute of Technology Guwahati
10. Banaras Hindu University

TOP UNIVERSITIES:

In the universities section, IISc retained its top rank followed by JNU, BHU, University of Hyderabad, Calcutta University and Jadavpur university securing the top five ranks. Anna University (Chennai) and Jadavpur University exchanged ranks 4 and 6. While Anna University fell from rank four to six, Jadavpur rose from six to four.

Here are the top 10 Universities:

1. Indian Institute of Science
2. Jawaharlal Nehru University
3. Banaras Hindu University
4. University of Hyderabad
5. Calcutta University
6. Jadavpur University
7. Anna University
8. Amrita Vishwa Vidyapeetham
9. Manipal Academy of Higher Education
10. Savitribai Phule Pune University

ENGINEERING RANKINGS:

In the engineering sphere, dominating the top five ranks are all Indian Institute of Technology. While the top five engineering colleges remained the same with Madras topping the list. Bombay and Delhi exchanged ranks with Bombay securing rank 2 and Delhi rank 3 this year. Kharagpur and Kanpur retained their ranks at 4 and 5 respectively.

Four Mumbai engineering institutes including IIT-B were listed in the top 100 namely - Institute of Chemical Technology (10), National Institute of Industrial Engineering (44), and Veermata Jijabai Technological Institute (95). These colleges were also listed last year and had secured the same rank.

Here are the top 10 engineering colleges:

1. Indian Institute of Technology Madras
2. Indian Institute of Technology Delhi
3. Indian Institute of Technology Bombay
4. Indian Institute of Technology Kharagpur
5. Indian Institute of Technology Kanpur
6. Indian Institute of Technology Roorkee
7. Indian Institute of Technology Guwahati
8. Indian Institute of Technology Hyderabad
9. Anna University
10. National Institute of Technology Tiruchirappalli

TOP COLLEGES:

Among Colleges, Miranda House (Delhi) has topped list just like last year. Four out of last years' top five were featured in this year's list too namely Hindu College, Presidency College and St.Stephen's college apart from Miranda House. Bishop Heber College dropped from rank 4 to rank 44 this year. While Lady Shri Ram College rose from rank 8 to secure rank 5 this year. Meanwhile, St Xavier's is the only from Mumbai in the Top 100. The college's rank, though, dropped to 96 from 74.

Here are the top 10 colleges:

1. Miranda House
2. Hindu College
3. Presidency College
4. St. Stephen`s College
5. Lady Shri Ram College for Women
6. Loyola College
7. Shri Ram College of Commerce
8. Rama Krishna Mission Vivekananda Centenary College
9. Hans Raj College
10. St. Xavier`s College, Calcutta

INNOVATION RANKING:

This year's additional ranking was the Atal Ranking of Institutions on Innovation achievements (ARIIA) with two categories- Public funded institutions and Private Institutions. While IIT-M, IIT-B, IIT-D, IISc and IIT-Kharagpur secured the top five ranks for innovation in the public category, in the private category the five winners were - Vellore Institute Of Technology, Kalinga Institute Of Industrial Technology Khordha, S.R.M. Institute Of Science And Technology, Jss Academy Of Higher Education & Research and Vel Tech Rangarajan Dr. Sagunthala R & D Institute Of Science And Technology. All the above-listed institutions are engineering college with the exception of IISc. ICT was the only other Mumbai college to be ranked in this category, securing rank six in the public category.

MANAGEMENT COLLEGES:

Among Management colleges, the top five ranks were secured by IIMs - Bangalore, Ahmedabad, Calcutta, Lucknow and Indore. In the top 100 B-schools, five from Mumbai made it to the list—IITB's Shailesh J Mehta School of Management, SP Jain Institute of Management and Research, NITIE and KJ Somaiya.

1. Indian Institute of Management Bangalore
2. Indian Institute of Management Ahmedabad
3. Indian Institute of Management Calcutta
4. Indian Institute of Management Lucknow
5. Indian Institute of Management Indore
6. Indian Institute of Technology Kharagpur
7. Xavier Labour Relations Institute
8. Indian Institute of Management Kozhikode
9. Indian Institute of Technology Delhi
10. Indian Institute of Technology Bombay

Bacteria on your paper cups, tissues and pizza boxes?

<https://www.livemint.com/news/india/bacteria-on-your-paper-cups-tissues-and-pizza-boxes-1554873023121.html>

- The source of bacteria has been identified in agro-residues present in the raw material of paper cups, tissues, pizza boxes, etc.

- IIT Roorkee conducted the study after collecting random samples from popular confectioners and fast food restaurants.



Breaking the preconceived notion that disposable cups, plates and boxes made of paper are safe and hygienic, a research funded by the Ministry of Human Resource Development (MHRD) has revealed that food packaging made of paper pulp may be laced with hazardous bacteria.

The comprehensive research done by Indian Institute of Technology (IIT) Roorkee, found the presence of bacteria in all the samples collected randomly from popular confectioners and fast food restaurants, ranging from 1.3×10^2 to 6.1×10^3 cfu/g. Most of the samples contained bacteria in more than the permitted concentration of 2.5×10^2 cfu/g as set by Food and Drug Administration (FDA). Over 10 samples were tested that included paper plate, cake box, fruit tray, tissue paper, coffee cup, pastry box, sweet box, pizza box, French fries box, and paper bag.

According to the findings of this research published in the Food and Nutrition Sciences Journal this week, the detected bacteria were from genera Bacillaceae, Staphylococcus and Pseudomonas. According to the FDA declaration, pathogenic bacteria such as *B. cereus* and *S. aureus* have been associated with food borne diseases.

Since many years, the food packaging industry has been using disposable paper based materials such as boxes, bags, cups, containers, plates, sacks, and tissue paper. The research has highlighted that the food packaging industry generally uses papers and paperboards (PPBs) especially for disposable products. According to the Framework Regulation of the European Union, no transfer of contamination should occur from food packaging material to the food items.

The study found some contaminants in food packaging PPBs were found to be *B. subtilis* and *P. aeruginosa*, which produce enzymes like peroxidases and lipoxxygenases that are odor generating enzymes.

The researchers have warned that it is essential to monitor the level of bacterial exposure to consumers through food PPBs, especially when the food comes in contact with the packages. "The results inferred by the present study give an idea about the number and type of bacteria present in the Indian food PPBs that may cause health hazards, generate odors, etc," Chhaya Sharma, Associate Professor, Department of Paper Technology, IIT Roorkee, Saharanpur Campus, said in the study.

According to the report, the source of bacteria Bacillus and Pseudomonas has been identified in agro-residues present in the raw material. The percentage of other pulp fibers like softwood

mechanical pulp, softwood chemical pulp, and hardwood chemical pulp in the samples has also been determined.

"The maximum percentage of agro-residues, softwood mechanical pulp, softwood chemical pulp and hardwood chemical pulp was present in cake box, pizza box, coffee cup and tissue paper respectively, while the minimum of of agro-residues, softwood mechanical pulp, softwood chemical pulp and hardwood chemical pulp was present in coffee cup, paper plate, french fries box and paper bag respectively," said Sharma in the study.

IIT Mandi develops safe, long-lasting, quicker battery

<https://www.indiatoday.in/education-today/news/story/iit-mandi-develops-safe-long-lasting-quicker-battery-1498385-2019-04-10>

A team of researchers at IIT Mandi has developed supercapacitor batteries which be charged and discharged instantly.



(From L to R) Viswanath Balakrishnan, Associate Professor, School of Engineering, IIT Mandi, and his research scholar, Piyush Avasthi, research scholar.

Charging battery is full of hassles. But, what if you get a permanent solution for charging? The thinker tank of IIT Mandi brings this never-ending issue of charging the battery to rest as they have developed a 'perfect' battery that can store large amounts of energy, and be charged rapidly and repeatedly. The lithium-ion battery that now powers almost all our consumer electronics devices such as mobile phones, laptops and even electric cars, has its own limitations. One of the disadvantages with batteries is that charging takes a lot of time, which results in extended down-times of operation. In addition, durability is another major concern.

This is an answer to regular battery

Viswanath Balakrishnan, Associate Professor, School of Engineering, Indian Institute of Technology Mandi, and his research scholar, Piyush Avasthi, have recently developed aligned carbon nanotube-based electrodes that could enable high energy supercapacitors.

"A promising route to improving the performance of energy storage devices, especially in terms of cycling life and charging times, is to move away from batteries towards supercapacitors", says

Balakrishnan. Supercapacitors can charge and discharge instantly and can ideally last across millions of charge-discharge cycles without performance degradation.

They also have a higher power density than batteries. Where they have fallen short so far, is in the area of energy density; supercapacitors have forty times less ability to store energy than the state-of-art lithium-ion battery.

What is supercapacitor?

A supercapacitor essentially consists of two conducting electrodes immersed in an electrolyte, which are separated by an electrically insulating layer to separate the charges.

While applying the current, potential difference develops between two electrodes and oppositely charged ions physically adsorb on the respective surfaces of electrodes.

This charge storage mechanism is highly reversible which makes supercapacitor to charge-discharge very quickly.

Carbon nanotubes, tiny tubes of carbon, a hundred thousand times thinner than the human hair, are used as electrodes, making supercapacitors' energy density increase.

"Tuning wetting behaviour of supercapacitor electrode surface plays a crucial role in various interfacial processes as it directly affects mass transfer, formation of the electric double layer, and electron delivery at the interface", the researchers write in their paper.

Process of making these batteries

IIT Mandi researcher Piyush Avasthi used a process called **Chemical Vapor Deposition to produce 'forests' of vertically aligned carbon nanotubes that are wettable (hydrophilic) by the electrolyte.** The perfectly aligned nanotubes, that were a few micrometers in height, were grown on a stainless-steel mesh and treated with two different ways to enhance their hydrophilic properties - in one, the forests were treated with potassium hydroxide (KOH), and in the other, they were coated with an ultrathin layer of titanium dioxide (titania), which made the nanotubes superhydrophilic.

While KOH treatment resulted in better energy density than randomly oriented carbon nanotubes, treating with titania resulted in a 102-fold increase in energy density, 20-fold increase in specific capacitance, and 13-fold increase in power density. With that kind of improvement, supercapacitors can certainly give lithium-ion batteries a run for their voltage.

The stainless-steel mesh on which the carbon nanotubes were grown, is physically flexible and would allow incorporation of the energy storage devices on wearable, miniaturized and portable electronic products and smart devices.

Balakrishnan's research on advanced materials would hasten the realization of commercially viable, standalone supercapacitor-based energy storage solutions that are safer, more powerful and longer lasting than current state-of-art batteries.

Their research papers have been published in *Advanced Materials Interfaces* and *ACS Applied Nanomaterials*.

Usable groundwater rapidly depleting in north, east India: IIT Study

<https://timesofindia.indiatimes.com/india/usable-groundwater-rapidly-depleting-in-north-east-india-iit-study/articleshow/68814390.cms>



India's northern and eastern states saw a rapid decline in usable groundwater between 2005 and 2013, raising an impending risk of severe droughts, food crisis, and drinking water scarcity for millions of people, researchers have found.

A team from the Indian Institute of Technology (IIT) Kharagpur, West Bengal and Athabasca University, Canada, compiled the first estimates of usable groundwater storage (UGWS) at the state-level across all of India using both in situ and satellite-based measurements.

Groundwater-level data was used from 3,907 in situ monitoring wells across the country and the total UGWS was estimated between 2005 and 2013.

The estimate shows rapid depletion of UGWS in Assam, Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal.

In these areas, increases in agricultural food productions have resulted at the cost of non-renewable loss in groundwater volume at an alarming rate, the researchers wrote in the study published in the journal *Advances in Water Resources*.

On the other hand, southern and western Indian states like Andhra Pradesh, Maharashtra, Gujarat, Chattisgarh show replenishing usable groundwater storage trends.

Earlier works by the government agencies have only been able to estimate the total groundwater, only a part of which is usable for human purposes, said lead researcher Abhijit Mukherjee, associate professor Hydrogeology, department of geology and geophysics, IIT Kharagpur.

"The estimates show rapid depletion of usable groundwater storage during 2005-2013 in most of northern parts, losing 8.5 cubic kilometre per year (km³/year) of total groundwater, and eastern parts which lost 5 km³/year of total groundwater," Mukherjee told PTI.

He emphasised that more than 85 per cent of the groundwater usage in India is linked with irrigation abstraction practices.

India is the largest user of groundwater in the world. It uses an estimated 230 km of groundwater per year - over a quarter of the global total.

Groundwater being an essential natural resource for irrigational water supply during non-monsoonal months, large-scale depletion could have unforeseen consequences in future food security, said Mukherjee.

"Underground water is definitely declining in Rajasthan at faster rate. There are pockets in UP which have seen a dip in groundwater table as well," agreed Dr N C Ghosh, former Head of Hydrology, National Institute of Hydrology (NIH), Roorkee, who was not involved in the study.

The problem, Ghosh said, is compounded by over-exploitation of the ground water.

"About 85 per cent of rural drinking water needs and 65 per cent of irrigation needs and 50 per cent of urban drinking water and industrial needs are fulfilled from the ground water," he said.

Mukherjee noted that rapid depletion in UGWS would accelerate the decline in food production and availability of drinking water, two of the prime goals of achieving UN Sustainable Development Goals 2030.

"More than 120 million people would get affected only in the Gangetic states," he said.

The study combined borehole data from Central Ground Water Board, rainfall data and satellite data from NASA's Gravity Recovery and Climate Experiment (GRACE), a pair of satellites launched in 2002.

A northeastern state like Assam, which was regarded always as water-affluent, has lost two per cent of its usable groundwater resource, and is at the brink of suffering drought and famine in impending years, said researchers, including first author Soumendran Bhanja from Department of Geology and Geophysics, IIT Kharagpur.

Haryana, which gets an annual precipitation of 689 millimetres (mm), holds the highest levels of usable groundwater with 3,593 centimeters (cm) while Himachal Pradesh with a precipitation of 1,147 mm per year has the lowest UGWS level of 520 cm.

Assam and some parts of eastern India seems to be losing the usable groundwater storage at the highest rate, within the study period, the researchers found.

Subsequently, many of these states are now intermittently getting affected by the "groundwater drought" in recent summers.

"Our prediction suggests that these summer groundwater droughts would intensify in recent future years, to become severe to very severe by 2050, with possibility of spread over all seasons," said

Mukherjee.

These depletion trends and practices, he noted, have not only affected the groundwater storage but also declined the flow in the adjoining rivers, including Ganga, leading to its summer drying in recent years.

Researchers said the depletion is positively linked with the increased cropping practice of water intensive crops in these states and not necessarily related to change in rainfall patterns.

"Definitely there is huge pressure on groundwater and river flow of several rivers has also decreased. As a result river-aquifer interaction has been influenced. Wherever there is lack of organised water supply, the dependence on groundwater is high," Ghosh added.

Mukherjee said in order to develop a sustainable groundwater management programme, it is important to know the exact stresses.

"We need to develop a much robust quantitative approach, possibly with help of advanced hydroscience and data science techniques to understand the conjunctive water demands and usage," Mukherjee said.

April 9

Top 10: उच्च शिक्षण संस्थानों में IIT मद्रास अक्वल, JNU और BHU भी शामिल, देखें पूरी लिस्ट

<https://www.livehindustan.com/career/story-nirf-ranking-2019-released-iit-madras-topped-the-list-jnu-and-bhu-are-on-seventh-and-tenth-position-respectively-see-full-list-2480702.html>

केंद्रीय मानव संसाधन विकास मंत्रालय द्वारा उच्च शिक्षण संस्थानों को लेकर सोमवार को जारी राष्ट्रीय रैंकिंग में भारतीय प्रौद्योगिकी संस्थान मद्रास पहले स्थान पर है। मंत्रालय-(आईआईटी)2016 से नेशनल इंस्टीट्यूशनल रैंकिंग फ्रेमवर्क (NIRF Ranking 2019) का प्रकाशन कर रहा है, जिसे राष्ट्रपति रामनाथ कोविंद ने जारी किया है। इस सूची में भारतीय विज्ञान संस्थान, बेंगलोर और आईआईटी दिल्ली को क्रमशः दूसरा और तीसरा स्थान दिया गया है। शुरुआती 10 संस्थानों में से सात आईआईटी हैं।

जवाहर लाल नेहरू विश्वविद्यालय और बनारस (जेएनयू) हिंदू विश्वविद्यालय इस सूची में क्रमशः सातवें और 10 स्थान पर हैं। देश भर के कॉलेजों में दिल्ली विश्वविद्यालय के मिरांडा हाउस को इस सूची में सर्वश्रेष्ठ आंका गया है जबकि इसी विश्वविद्यालय से संबद्ध सेंट स्टीफन्स कॉलेज चौथे पायदान पर है। वहीं दूसरे, तीसरे और पांचवे स्थान पर क्रमशः हिंदू कॉलेज (दिल्ली), प्रेसीडेंसी कॉलेज है। (दिल्ली) और श्रीराम कॉलेज (चेन्नई)

वहीं जामिया हमदर्द इंस्टीट्यूट फार्मैसी में नंबर एक पर है। आईआईएम बेंगलुरु मैनेजमेंट कॉलेज में पहले नंबर पर, मेडिकल साइंस कॉलेज में AIIMS पहले नंबर पर, नेशनल लॉ स्कूल, बेंगलुरु टॉप लॉ कॉलेज बना। इसके अलावा टॉप-10 इंजीनियरिंग इंस्टीट्यूशन की सूची में पहले नंबर पर आईआईटी मद्रास, दूसरे पर आईआईटी दिल्ली और तीसरे पर आईआईटी बॉम्बे है। शीर्ष विश्वविद्यालयों की बात करें तो, आईआईएस बेंगलुरु पहले नंबर पर, जेएनयू दूसरे नंबर पर, बीएचयू तीसरे नंबर पर, यूनिवर्सिटी ऑफ हैदराबाद चौथे नंबर पर और कोलकाता यूनिवर्सिटी पांचवें नंबर पर है।

IIT-Madras took small steps to make the giant leap, say professors

<https://timesofindia.indiatimes.com/city/chennai/iit-m-took-small-steps-to-make-the-giant-leap-say-professors/articleshow/68786376.cms>

For the fourth year in a row, IIT-Madras has emerged the top-ranked engineering institution in the country. This year, it was number one in the overall category and the ‘top innovative institution’.

Professors at IIT-M said the seeds for the fruit were sown several years ago.

“We made a strategic plan several years back to see how we will go into 2020. Even before the rankings, a process was set up with a vision on how we wanted to go forward,” said professor Ravindra Gettu, dean, industrial consultancy and sponsored research, IIT Madras.

TOPPING THE CHARTS NIRF RANKINGS 2019			
TOP 5 COLLEGES	TOP 5 UNIVERSITIES	TOP 5 ENGINEERING INSTITUTIONS	TOP 3 MEDICAL COLLEGES
Presidency College 3	Anna University 7	IIT Madras 1	CMC, Vellore 3
Loyola College 6	Amrita Vishwa Vidyapeetham, Coimbatore 8	Anna University 9	Amrita Vishwa Vidyapeetham 5
Madras Christian College 13	Bharathiar University 14	NIT, Trichy 10	Sri Ramachandra Institute of Higher Education and Research 11
PSG College of Arts and Science, Coimbatore 17	Vellore Institute of Technology 19	VIT 18	
PSGR Krishnammal College for Women, Coimbatore 22	University of Madras 20	SRM Institute of Science and Technology 36	

34 COLLEGES FROM TN IN TOP 100

24 UNIVERSITIES FROM TN IN TOP 100

The plan implemented in 2014 outlined steps to better the quality and quantity of research output through an increase in research intensity, faculty strength, PhD student enrolment, infrastructure, engagement with industry and international collaborations. It further sought to make the IIT Madras Research Park, the first of its kind in the country, a force multiplier in the effort of doubling the sponsored research levels from that of 2014.

“We wanted to provide solutions for industry that were relevant to them and wanted to give importance to the connect that we have with industry. Also, we wanted innovation and entrepreneurship to play an important role. We have a research park which is aiding innovation through incubation,” he said.

Asked how IIT-M was different from other institutes, Gettu said, “It is the industry relationship. We value industry relationship and want to give solutions.”

With innovations up, the institution is filing almost 140 patent applications a year. Research publications have also increased – all these pushed IIT-M up the rankings.

But 15 years ago, the scenario was diametrically opposite. Patents were nil. Slowly, the institution realized the importance of patenting technologies and set up a cell. “Over the past four years, the patent filing increased by 50%. This brought the industry which took licences and technical knowhow from us. In turn, funding from the industry saw exponential increase,” a senior faculty member said.

IIT-K bats for collaboration between academia & industry

<https://timesofindia.indiatimes.com/city/kanpur/iit-k-bats-for-collaboration-between-academia-industry/articleshow/68785114.cms>

Former chairman of Indian Space Research Organisation (Isro) and chairman of IIT-Kanpur’s board of governors K Radhakrishnan formally inaugurated ‘Techopark’ on Monday.

He was accompanied by IIT-K director Abhay Karandikar at the event. The logo of Technopark was also unveiled during the ceremony.

Karandikar said, “Technopark aims to foster a collaboration between academia and industry by co-developing cutting-edge technology and innovations, while creating knowledge-based wealth.” Professor in charge for Technopark, Avinash Agarwal said, “Technopark was established under IIT-Kanpur Research and Technology Park Foundation. It eyes development of new technologies which are in tandem with national priorities and aims to create knowledge-based wealth by leveraging the institute’s competence.”

April 7

JEE Advanced: 12 सालों के प्रश्नपत्र वेबसाइट पर हुए अपलोड

<https://www.livehindustan.com/career/story-jee-advanced-12-year-question-paper-uploaded-on-the-website-2479607.html>



जेईई एडवांस ने पूर्व की परीक्षाओं के प्रश्नपत्र अपनी वेबसाइट पर अपलोड कर दिया है। अभ्यर्थी अपनी तैयारी व प्रैक्टिस के लिए ये प्रश्नपत्र डाउनलोड कर देख सकते हैं। अभ्यर्थियों की सुविधा के लिए 12 वर्षों यानी वर्ष 2007 से 2018 तक का प्रश्नपत्र अपलोड किए गए हैं। अभ्यर्थी वेबसाइट <https://jeeadv.ac.in/archives/past-question-papers.html> पर जाकर प्रश्नपत्र डाउनलोड कर सकते हैं। जेईई एडवांस ने दोनों पेपर के क्वेश्चन बैंक भी अपलोड किए हैं। ऐसे में बीआर्क व प्लानिंग और बीटेक की तैयारी करने वाले अभ्यर्थियों को सहूलियत होगी। गौरतलब है कि इस बार जेईई एडवांस आईआईटी रूड़की करा रहा है।

आईआईटी रूड़की करा रहा जेईई एडवांस

आईआईटी रूड़की ने जेईई एडवांस का ब्रोशर भी जारी किया है। इसमें अभ्यर्थियों से जुड़ी तमाम सूचनाएं दी गई हैं। जैसे रजिस्ट्रेशन शुरू होने की तारीख, आवेदन करने की योग्यता, फीस, कोर्स, शहर जहां परीक्षा आयोजित की जाएगी आदि। ब्रोशर के मुताबिक तीन से सात मई तक जेईई एडवांस के लिए ऑनलाइन रजिस्ट्रेशन कराए जाएंगे। फीस जमा करने की अंतिम तारीख 10 मई है। भारतीय छात्रों के लिए रजिस्ट्रेशन फीस 2600 रुपये तक तय की गई है। वहीं, विदेशी छात्र छात्राओं को-75 अमेरिकी डॉलर तक रजिस्ट्रेशन के लिए चुकाने पड़ेंगे। एडमिट कार्ड 27 मई तक डाउनलोड किया जा सकता है। वैसे 20 मई से एडमिट कार्ड डाउनलोड किया जा सकता है। जेईई एडवांस 27 मई को है।

आईआईटी में संचालित होने वाले कोर्स

बैचलर ऑफ टेक्नोलॉजी, बैचलर ऑफ साइंस, बैचलर ऑफ आर्किटेक्चर, बीटेकएमटेक की दोहरी - डिग्री, बैचलर ऑफ साइंस और मास्टर ऑफ साइंस की दोहरी डिग्री, इंटीग्रेटेड एमटेक और इंटीग्रेटेड एमएससी।

IIT-Bombay researchers find bacteria that may help remove pollutants

<https://timesofindia.indiatimes.com/city/mumbai/iit-bombay-researchers-find-bacteria-that-may-help-remove-pollutants/articleshow/68758987.cms>

While carrying out a routine experiment on degradation of pollutants, researchers from IIT-Bombay have stumbled upon an organism which preferentially feeds on hazardous aromatic pollutants over glucose. The discovery of this strain of bacterium, called *Pseudomonas putida* CSV86, can help in eliminating a diverse range of aromatic pollutants such as naphthalene (in household insect repellents), benzoate (in food preservatives), plastics and industrial chemicals.


DISCOVERY ON CAMPUS

> Most bacteria feed on simple carbon sources like glucose and organic acids over complex compounds like aromatic pollutants

> Pseudomonas putida CSV86, a strain of bacterium discovered by scientists at

IIT-B display reverse behaviour. This strain prefers aromatic pollutants over simple glucose

> This peculiar behaviour can help in removal of harmful pollutants even in the presence of simpler carbon sources. It can help in bioremediation, treatment of industrial effluent



The findings of the study, which was published in the journal Applied and Environmental Microbiology, will not only help in getting rid of pollutants in waste water by breaking them down into safer chemicals, but further gene study could have implications in the field of agriculture too.

Most living organisms are known for consuming glucose over other complex compounds in the process of degradation, explained professor Prashant Phale, from the department of biosciences and bioengineering at IIT-Bombay, who led the study. "This preferential behaviour of living organism choosing the simple source of carbon first - in this case glucose - is well known as carbon catabolite repression in biochemistry. However, this particular strain of bacteria showed the exact opposite behaviour when we studied it in isolation. Given glucose and aromatic compounds together, the organism preferentially metabolises aromatic compounds first. It moves on to glucose only when the aromatic compounds are exhausted," said Phale. The bacterium's peculiar order of preference can help in removal of harmful pollutants even in the presence of simpler carbon sources.

"It is the first time that such an organism has been discovered," said Phale. In most bacteria, the presence of simple carbon sources like glucose suppresses the expression of genes (process by which information from a gene is used in synthesis of a functional gene product) that help in breaking down aromatic compounds. This phenomenon is reversed in the CSV86 strain, with aromatic compounds suppressing the use of glucose. The researchers are trying to do experiments at molecular level on why the organism behaves differently. "We are trying to identify the factors/proteins involved in rendering preferential utilisation of aromatics over glucose," said Phale.

"My lab is continuing its work on this strain, which was isolated from Indian soil. The strain, displaying the unique property, is only with us at IIT-Bombay and has not been reported by any research group or in any scientific literature," said Phale. He added that their findings could help in producing genetically engineered CSV86 strain to efficiently break down any desired aromatic compound. "It could also find an important application in the field of agriculture. The strain introduced into the soil could be used to preferentially degrade aromatic components of pesticides and insecticides to naturally cleanse the environment without harming the plants. This bacterium belongs to genus Pseudomonas, which promotes plant growth," added Phale.

April 6

Annual refresher course training made mandatory for varsity teachers

<http://www.newindianexpress.com/nation/2019/apr/06/annual-refresher-course-training-made-mandatory-for-varsity-teachers-1960924.html>

Teachers in universities will now have to undergo mandatory refresher course training every year, starting this year, passing which will be compulsory.



Teachers in universities will now have to undergo mandatory refresher course training every year, starting this year, passing which will be compulsory.

Officials in the University Grants Commission said that the move was part of measures taken to upgrade the quality of education being imparted in Indian universities.

“The refresher courses have been designed so that the teachers keep abreast with the latest in their field, and what new teaching methodology do they need to incorporate for the betterment of students,” a senior UGC official said.

NEW METHOD

The refresher course will be subject-specific	Will follow latest research, findings, latest information on the subject
Will contain required changes in teaching methodology	

Refresher courses

University teachers will now have to undergo a mandatory refresher course training every year

THE SCORING PATTERN

85% Scores or higher to get A	75-85% Scores will get B	65-75% Scores will get C
55-65% Scores will get D	50-55% Scores will get E	50% Scores or lower will get F

UPGRADE NEEDED UGC officials said these measures were taken to upgrade quality of education being imparted in Indian universities

AMIT BANDRE

The courses will be subject-specific and will be updated every year.

“At the end of the course, teachers will be required to appear in a test to assess how much have they learned through the course,” the official added.

Based on their score, the teachers will be graded from A to F, where A will be given to teachers scoring over 85 per cent and F to those scoring less than 50 per cent.

“Those who are graded F will be considered as having failed the test and will be made to repeat the refresher course,” another UGC official told this newspaper.

The higher education department of the Union Human Resources Development Ministry has taken a slew of measures for upgrading the quality of education across institutes of higher education.

The regulator of technical institutes—All India Council of Technical Education—too, starting 2019, is making refresher training courses for teachers in engineering, management and other technical institutes mandatory.

Attending these courses will be taken into account in the academic performance indicators of the teachers, AICTE sources said.

The UGC has been taking action to ensure quality education. Recently, it prohibited imparting distance degree programmes in agriculture.

The decision was taken by the higher education regulator on the ground that a degree programme in agriculture is technical in nature as it requires practicals or laboratory courses. The Union agriculture ministry had referred the matter to the commission.