



NEWS CLIPS

January 12-18, 2019

Highlights of the Week@IITD

Public policy making course introduced in IIT-Delhi

January 17, 2019 <https://www.hindustantimes.com/education/public-policy-making-course-introduced-in-iit-delhi/story-RkuiRguX31giOVQ84BDidl.html>

The school, which is presently recruiting its first batch of faculty, will offer courses in areas such as internet, digital information and society, industry and economy, energy and environment, agriculture, food and water, among others.



IIT Delhi will offer new public policy making course

The Indian Institution of Technology in Delhi (IIT-D) on Wednesday announced it has introduced courses in public policy making at undergraduate, post graduate and research level at its recently established school for public policy. This is the first time when the institution will work in the field of public policy making.

The school, which is presently recruiting its first batch of faculty, will offer courses in areas such as internet, digital information and society, industry and economy, energy and environment, agriculture, food and water, among others. “The IIT-D is already working on thousands of research projects. We are planning to integrate it with public policy making. We are planning to start some elective courses and short duration programmes in policy making for undergraduate students and also some full time programmes for post graduates from next academic session (2020-21). Meanwhile, some Ph D students will start working in the area from this year only,” said Ambuj Sagar, head of the school for public policy.

The institution is aiming to make the school a “hub” for public policy research. “We were thinking about starting something like this that can make a more significant and direct social impact. The

academic efforts of the school are expected to help not only the policy makers of the government agencies but also entities such as philanthropy, foundation and business enterprises,” Sagar said.

IIT-D director Ramagopal Rao said the school for policy making is “essential” in the present times. “As an academic institution, IIT-D offers an intellectually independent and value neutral location for engaging with multiple and diverse prospective and bring together stakeholders as well as engage with policy makers,” he said.

The institution has collaborated with TATA trust, which is already working in the field, for the purpose. “The trust has a long history of working in the field of public research and policy making in the country. The collaboration will help us making the school world class hub for research in public policy making,” Rao said.

IIT-Delhi gets Rs 50-cr grant for School of Public Policy

January 16, 2019 https://www.business-standard.com/article/news-ians/iit-delhi-gets-rs-50-cr-grant-for-school-of-public-policy-119011601087_1.html

The Indian Institute of Technology (IIT)-Delhi and Tata Trusts signed a pact on Wednesday, under which the trust will give a grant of Rs 50 crore to the institution over a period of five years for the School of Public Policy.

The School, which was established last year on the IIT campus with two faculty members, is planning to start its first batch of Ph.D students from this academic session.

"We are grateful for their (Tata Trusts') support, which will significantly bolster and accelerate our efforts to establish the School of Public Policy as the country's leading centre of research, education and engagement on the role of public policy," IIT-Delhi Director Ramgopal Rao said at an event.

The school is in the process of hiring its first crop of faculty members to work broadly on topics such as energy, environment, agriculture, food, water, digital information system, health innovations and sustainable habits.

"We intend to work on different topics. For now, we are working on a few projects, related to higher education, biotechnology and how the farmers are using the information provided by Met department," Rao explained.

"We hope to start our first batch of Masters from 2020," Ambuj Sagar, Head of the School of Public Policy, told IANS.

Braille-ient breakthrough: this team from IIT Delhi helps blind students ‘see’ diagrams in their science books

January 17, 2018 <https://yourstory.com/2019/01/iit-delhi-braille-tactile-diagram-rlf/>

Raised Lines Foundation (RLF) at IIT Delhi has developed a technology that uses 3D printing to produce high-quality yet affordable tactile diagrams on a large scale for books and other printables in Braille. The potential impact for empowering the visually impaired is huge.



Can you imagine a biology class without diagrams? Or learning science, technology, engineering, and mathematics (STEM) subjects without graphs and drawings? Blind and visually impaired students often have to forego these subjects because of the challenge involved in learning these concepts and processes without the ability to see.

A typical textbook made available to visually impaired students in India typically consists of only text in the form of Braille. Diagrams and pictures are removed. As a result, blind students are obligated to study subjects that are theory-based, “thus almost completely eliminating opportunities for them in most of the new age jobs,” says Piyush Channana, a PhD student at IIT Delhi.

To enable such students to study science and allied subjects, 36-year-old Piyush and his team set up the Raised Lines foundation (RLF), a social welfare (Section-8) company, at IIT Delhi in July 2018.

RLF has developed a technology for producing high-quality, affordable, and most importantly, tactile diagrams that can be understood by the blind, **using 3-D printing**. Tactile diagrams are images that consist of raised lines and textures that can be used by the visually impaired to understand the graphical information using their sense of touch. **The technology helps create moulds and allows thermoforming, which is needed to produce these tactile diagrams.**



While the concept of tactile diagrams has been around for a while abroad, RLF is working the Indian education system to incorporate simplified **tactile diagrams in textbooks for the visually impaired**. If successful, it could open up vast areas of education that have been off limits to blind students.

Beginning at IIT Delhi

RLF is a spin-off of **Assistech Labs, an interdisciplinary group of faculty, research staff, and students at IIT Delhi. The team uses technology to find affordable solutions for the visually impaired.** Sometime in 2013, the group developed the SmartCane, an aid to help the visually impaired move around independently and safely.

Ironically, the biggest problem it faced was trying to explain how the SmartCane worked to those who were supposed to use it. First, the team thought that if there was a diagram, they would be able to understand it. But how do you draw a diagram that could not be seen? It had to be felt, that is, it had to be tactile. The first tactile diagram they created was made of lentils!



(L) A tactile diagram to help explain how the Smartcane works. (R) The first attempt at creating the tactile diagram using pulses and thread.

The next step was to put the diagram into the SmartCane manual. But since the first diagram was handmade, the challenge was to create it at scale. And so the research continued. That's when they realised that the problem of representing a visual to the visually impaired ran much deeper.

“We realised that blind students were leaving subjects like science and mathematics after school because the Braille books come without diagrams, and everything is dependent on the effort of the teacher,” Piyush explains.

The implications of losing a pool of potential talent are huge. Consider the numbers. According to the World Health Organisation (WHO), an estimated 285 million people worldwide are visually impaired, among which nearly 39 million are blind. The 2011 census data by the government shows that India has more than five million visually impaired people, the largest in any country.

“A very significant portion of this population is children in the age group of five to 19,” says Piyush, which means that the potential for impact is huge.

How do tactile diagrams help?

Pictures and graphics play a critical role in education right from the beginning. **“Alphabets are taught through picture books where the sounds associated with the pictures (e.g. A for Apple with a picture of an apple) reinforce the learning.** Similarly, numbers are introduced using picture books where a number of different common items is shown to reinforce counting (e.g. three is shown with a picture of three balls),” says Piyush.

As we progress in school, the role of graphics becomes more important. “Chemical structures and equations, mathematical (geometry graphs, charts) diagrams, illustrations of physical processes as well as parts of plants and animals, structure, concepts of physics, and geographical maps, etc. are almost always taught to sighted children using pictures and graphics,” he adds.

“This is essentially why RLF was incubated at IIT Delhi. The goal is to provide textbooks in an accessible format along with the tactile diagrams to every student with visual impairment and empower them to choose subjects by choice and not compulsion.”

This inspired the team at IIT Delhi to do this on a bigger scale and solve the problem. **Initially, the team worked closely with blind people, organisations for visually impaired, special teachers, and several other stakeholders to come out with an easy, scalable, and automated solution.**

The team also had multiple versions with different kind of sheets and tools, but the best results were produced by 3D printers, which would print customised diagrams for visually impaired persons, says Piyush.

“Many organisations working in the field use services of special educators to produce customised tactile diagrams for their own small number of clients. This is neither scalable nor conducive for quality production. On the other hand, neither the publishers nor agencies like Braille Press have access to professional tactile designers,” says Piyush.

In just six months of its launch, the 12-member team at RLF has made this solution scalable and produced 2,000 tactile supplement books. It can also produce about 500 books per month in-house.

It has produced more than 70,000 tactile copies of 1,000 unique diagrams in maths, science, geography, and economics books for Classes six to 12. RFL has also created manuals on menstrual hygiene management and has added diagrams in the book, 'Yogikaspars - Resource for Teaching Yoga Asanas' for yoga postures.

The company has also started receiving independent orders like sitemaps from art galleries, and for training manuals, etc. through its website, apart from direct orders from organisations. “Our focus now is on the market penetration, business development, and diversification,” says Piyush. Training manuals for computers, smartphones, musical instruments, building layouts, and floor plans are all in the works.

The flow of capital

The project was undertaken as the Centre of Excellence in Tactile Graphics (CoETG) in 2015 and later renamed Raised Lines Foundation. **CoETG was first supported for three years by Ministry of Electronics & Information Technology (MeitY), Government of India, through which it developed the complete know-how of designing and producing tactile diagrams. MeitY has extended support for another two years.**

“At present, we are incubated as Raised Lines Foundation at IIT Delhi, through Technology Business Incubation Unit (TBIU) route and running our operations from IIT Sonipat Campus,” informs Piyush. IIT Delhi faculty members, Prof M Balakrishnan and Prof PVM Rao are also part of RLF.

Funding is a community effort. RLF has received support from bodies like NCERT, state education boards, the Sarva Shiksha Abhiyan (MHRD), WSSCC (Water Supply and Sanitation Collaborative Council), and other organisations working for blind people. While this may sound impressive, it is just the beginning. To fulfill this vast need for textbooks, RFL needs to scale up at a very high pace.

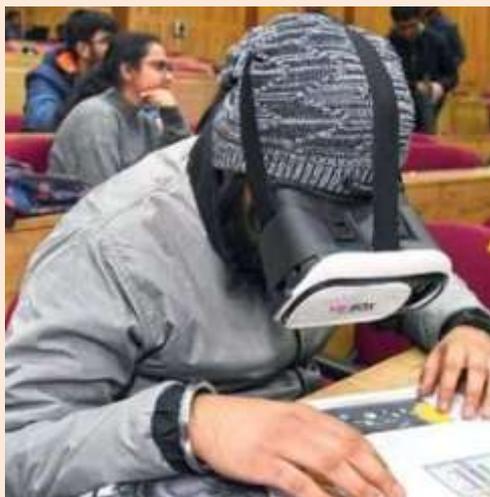
“Being a not-for-profit, we are looking at a mix of public financing and CSR funding to support us in producing and disseminating these books,” says Piyush.

The next chapter

In the next three years, RFL aims to reach more than 200 organisations working for the blind, including schools and training institutions, and deliver more than 25,000 tactile books across the country. Besides designing 50+ books, including textbooks in multiple languages, training modules, and other books, it also wants to supply the books to clients outside India.

Brainwaves at IIT hackathon: Students vie for startup break

January 14, 2019 <https://timesofindia.indiatimes.com/city/delhi/brainwaves-at-iit-hackathon-students-vie-for-startup-break/articleshow/67517677.cms>



From an app that could help farmers identify quality of seeds to one that records your heartbeat, there were innovations aplenty at the IIT-Delhi Hackathon, which saw 93 teams from engineering institutes across the city take part. They were vying for an opportunity to get their own startup at IIT-D's incubation centre.

The two-day event was organised by the IIT-D Alumni Association and saw students from institutes like NSUT, DTU and other engineering colleges come up with innovative ideas. Dvizma Sinha, with her four-member team, came up with a clean-toilet plan: their app can help you locate clean toilets in your area. “If a public toilet is not clean, the app allows you to lodge a complaint with the authorities,” Sinha said.

A team of students from Maharaja Agrasen Institute of Technology developed a heartbeat recorder.

Krishiv Goyal, team member, said the app allowed you to check your heartbeat “from the comfort of your home”.

Tanmay Shrivastava and his team from Bharati Vidyapeeth College of Engineering presented their project on indoor localisation through LEDs. “With this technology, a building is divided into areas according to LED lights. Any person looking for a certain place inside the building will be guided by an app that will act as a GPS. This technology will be effective in museums,” the student said.

Aasif Mujtaba, research scholar at IIT-D and one of the judges at the event, said: “The ideas presented by students were both practical and commercially viable. At the same time, they can serve as instruments of social change,” he said.

Teams from Bharati Vidyapeeth, Delhi Technological University and IIT Delhi were among the winners.

IIT Delhi and International Committee of the Red Cross Launch Humanitarian Policy and Technology Platform

January 13, 2019 <https://swarajyamag.com/insta/iit-delhi-and-international-committee-of-the-red-cross-launch-humanitarian-policy-and-technology-platform>

Humanitarian Policy and Technology Platform has been launched by the Indian Institute of Technology (IIT) Delhi and International Committee of the Red Cross (ICRC) in the National Capital Region (NCR).

In a statement issued by IIT Delhi, it has been said that the platform is established to generate and facilitate discussions and research on the new technologies for humanitarian action and the compliance of new technologies of warfare with International Humanitarian Law (IHL), reports The Hindu.

The Director of IIT Delhi, Professor V Ramgopal Rao, believes that the platform will play a crucial role in response to the opportunities and the challenges in the era of rapid technological advancement.

Likewise, Vice-President of ICRC, Gilles Carbonnier, believes that the platform will bring together experts from IIT, ICRC and multiple stakeholders from Asia in the queue to address the humanitarian concerns.

January 18

Research scholars demand stipend hike

<https://www.thehindu.com/news/cities/Delhi/research-scholars-demand-stipend-hike/article26008743.ece>

Converged at Shastri Bhavan for day-long strike, 700 of them detained by police

Research scholars from several institutes across the country converged at Shastri Bhavan on Wednesday for a day-long strike demanding a hike in stipends and quicker disbursement of research funds.

About 2,000 students and researchers from the Indian Institutes of Technology (IITs) and the Council of Scientific & Industrial Research (CSIR) took part in the protest. About 700 of them detained by the Delhi Police until 4 p.m., said Vicky Nandal, a doctoral student at IIT, Delhi.

Social media

“We staged a peaceful protest from 10 a.m. on Wednesday but were not granted an audience by the Minister or senior officials [of the Union Ministry for Human Resource Development]. We plan to continue our protests at our respective institutes from Thursday,” he told The Hindu.

Wednesday’s strike was the culmination of a five-month long campaign, largely run on Twitter, by research scholars from several institutes across the country. Their key demand is 80% hike in fellowship.

Currently, researchers with Junior Research Fellowship (JRF), a coveted fellowship offered by the CSIR, gets ₹25,000 each.

“Is there anybody in the government who can explain how a research scholar will be able to run his/her family and fulfil even the basic necessities of a family with such a small amount,” asked a memorandum by the protesting students, who congregated under the banner of All India Research Fellows.

ISC meet

Prime Minister Narendra Modi had at the Indian Science Congress (ISC) in Jalandhar earlier this month extolled the importance of scientists and researchers in India’s development and modified the catchphrase ‘Jai Jawan, Jai Kisan’ to ‘Jai Jawan, Jai Kisan, Jai Anusandhan [Hail Soldiers, Hail Farmers and Hail Researchers]’ in his inaugural address.

“On the one hand our Prime Minister boasts at the ISC about research, while on the other hand research scholars of the nation are forced to hit the streets to get their legitimate demands [in fact, rights] fulfilled,” the memorandum notes.

In response to the scholars’ threat to strike, Principal Scientific Adviser K. VijayRaghavan had tweeted that the government is working to address student’s demand. An attempt by The Hindu to contact him went unanswered.

IIT Mandi develops novel system to detect early signs of kidney damage

<https://www.indiatoday.in/education-today/news/story/iit-mandi-develops-novel-system-to-detect-early-signs-of-kidney-damage-1433586-2019-01-18>

The team is set to conduct a more extensive trial over the next five to six months on a range of patients to understand how it performs for different types of disorders.

The researchers at Indian Institute of Technology (IIT), Mandi have developed a novel system that can detect early signs of kidney damage by measuring even low levels of a protein marker in urine and blood samples. The test, which detects the presence of protein albumin in urine and blood, can serve as an early indicator of various health disorders such as renal dysfunction as well as diseases that result from diabetes.

Information about the tests:

1. At present, dipstick tests are available in the market to detect albumin in urine.
2. However, the condition of microal-buminuria in which kidney leaks small amounts of albumin into the urine is difficult to analyse using these tests.

"The urine dipsticks available in the market can correctly estimate albumin concentration in urine up to 30 microgrammes per decilitre (mg/dL), whereas with our technique one can measure levels as low as 3.3 mg/dL," Shubhajit Roy Chowdhury, an assistant professor at IIT Mandi, told PTI.

3. The system comprises of a chamber that accepts urine or blood serum and a fluorescent dye.

"The dye, which we developed at IIT Mandi, binds with the albumin molecules in the urine. This composite then absorbs near infra-red (NIR) radiation of 740 nanometre wavelength, and emits radiation at 806 nanometre wavelength," Roy Chowdhury said.

"We have conducted a clinical trial with 15 patients, with promising results," he added.

Further plans:

1. The team is set to conduct a more extensive trial over the next five to six months on a range of patients to understand how it performs for different types of disorders.
2. It will be the first device which has the potential to detect and quantify urinary albumin through the enrichment of the fluorescent signal, the researchers said.
3. The project, jointly funded by the Ministry of Human Resource Development and Indian Council of Medical Research, would help detect many health disorders in premature phase.

"The cost of doing the test will come down to below 30 rupees. At present, while the dipsticks are not very costly, the device to analyse the results may cost up to a few lakhs," Roy Chowdhury said.

January 17

Indian Universities Gain Ground In Emerging Economies Rankings 2019

<https://academiamag.com/indian-universities-gain-ground-emerging-economies/>

Indian universities increased their foothold in the Times Higher Education (THE) Emerging Economies University Rankings 2019, going up in number from 42 in 2018 to 49 this year. According to data released by Times Higher Education (THE), Indian universities have shown remarkable improvements, with 25 of its universities securing a spot among the top 200, an increase from 17 universities in 2018.

The Indian Institute of Science was the top ranked Indian university in the list, securing the 14th position, followed by Indian Institute of Technology Bombay (27th). However, both the universities dropped one place each due to increased competition among universities worldwide.

THE table 2019 denotes a mixed picture for India, with numerous new entrants and high risers, alongside numerous institutes that drop back. The Indian Institute of Technology Roorkee improved its position 21 places to secure the 35th ranking, thanks to advancements in research (reputation, income, volume) and industry income (knowledge transfer).

The highest new entrants for India this year was The Indian Institute of Technology Indore (61st) and the JSS Academy of Higher Education and Research (joint 64th). The Savitribai Phule Pune University climbed the ladder and secured joint 93rd position, alongside the National Autonomous University of Mexico, due to a rise in their research and citation scores, according to the organisers of the ranking.

Banaras Hindu University and Amrita University improved their rankings by jumping into the top 150, while the Indian Institute of Science Education and Research, Pune IIT Hyderabad featured for the first time in THE rankings.

WHERE UNIVERSITIES STAND

EMERGING ECONOMIES RANKINGS		
INSTITUTION NAME	2018	2019
Indian Institute of Science	13	14
Indian Institute of Technology Bombay	26	27
Indian Institute of Technology Roorkee	56	35
Indian Institute of Technology Kanpur	49	46
Indian Institute of Technology Kharagpur	45	55
Indian Institute of Technology Indore	NA	61
JSS Academy of Higher Education & Research	NA	64
Indian Institute of Technology Delhi	63	66
Indian Institute of Technology Madras	70	75
Savitribai Phule Pune University	180	93
Indian Institute of Science Education and Research, Pune	NA	109
Tezpur University	99	116
University of Delhi	127	130
Jadavpur University	117	130
Banaras Hindu University	201-250	134
Indian Institute of Technology Hyderabad	NR	139
Indian Institute of Technology Guwahati	114	140
Amrita University	195	141
Danish University	130	150

THE NUMBERS

- ▶ Percentage of international students | 1%
- ▶ Student ratio of females to males | 47:53
- ▶ Number of students | 18,360
- ▶ Number of students per staff | 21.5

THE CRITERIA

Parameters	2019	2018
Overall	27.2	26.6
Citations	54.5	55.5
Industry Income	34	31.8
International outlook	16	16
Research	11	8.6
Teaching	26.9	27.1

Besides the overall score, PU's score in industry income and research has also increased. However, the score in teaching has taken a slight beating

Ellie Bothwell, Editor Times Higher Education (THE) said: “Indian institutions have immense potential for success – not only on the emerging stage but globally. But, while progress is clearly being made, other economies that previously lagged behind – such as Egypt and Malaysia – are starting to advance at a much faster rate”.

She further added: “In this year’s table, India’s institutions perform well in teaching. However, they are significantly behind the global average in terms of international outlook. Strengthening this will further elevate the nation’s global reputation for higher education, encourage important research collaborations and help attract international students.”

This year Chinese universities were clearly at top, securing 72 places in the list and claiming four of the top five places. This made China the most represented country in the Times ranking 2019. Tsinghua University surpassed Peking University to secure the top position overall, while Zhejiang University rose three places to secure the third spot. The University of Science and Technology of China got the fourth position and the Lomonosov Moscow State University claimed the final spot among the top five universities of emerging economies.

35% teaching posts vacant in IIT and higher education institutes: HRD minister

<https://timesofindia.indiatimes.com/home/education/news/35-teaching-posts-vacant-in-iit-and-higher-education-institutes-hrd-minister/articleshow/67573842.cms>



Union HRD minister Prakash Javdekar on Thursday admitted that IITs and other institutions of higher education have 35% vacant teaching posts in India.

Javdekar opened a roundtable on 'Opportunities in Science, Technology, Engineering and Mathematics (STEM) Education and Research in India' organized in Gandhinagar on sidelines of Vibrant Gujarat Global Summit (VGGGS) 2019 at Gujarat Science City.

The minister mentioned three main reasons for India's 'brain drain' problem - adversely affecting research and technology Innovation - while asserting that Indians today are making their mark in every major technology firms ranging from Microsoft to Google but the country doesn't have major research-based patent, technology or product to boast of.

"The students are not finding adequate supervisors, research lab/ facilities and scholarships. We are addressing all three issues through our initiatives," said Javdekar.

He mentioned that the government is working for 'brain gain' by incentives to Indians studying and working abroad. He added that Rs 30,000 crore have been earmarked for upgrade and establishment of research labs across India.

"The students through initiative such as IMPRINT can avail up to Rs 1 lakh per month scholarship. We are also boosting research fellowship," said the HRD minister.

For the education bureaucrats, Javdekar said education system should focus on innovation. "In my interactions with teachers, I am told they are not asked about their teaching and innovations but if they are adhering to the norms laid out. This needs to stop," said Javdekar, giving example of an IIT professor who teaches Mathematics through toys.

The minister along with Gujarat CM Vijay Rupani inaugurated Beyond Planet Earth and Futuristic Technology exhibitions at Science City.

AI education strengthens in India with announcement of dedicated course

<https://www.devdiscourse.com/article/technology/325870-ai-education-strengthens-in-india-with-announcement-of-dedicated-course>



The new course will have 20 seats and the eligibility is clearing the JEE-Advanced test.

Indian Institute of Technology-Hyderabad (IIT-H) on Thursday announced the launch of a full-fledged bachelor's programme in Artificial Intelligence (AI) technology from the new academic session, a first for the country and only the third globally. IIT-H is already offering a Masters in Technology programme in AI-Machine Learning (ML).

Besides IIT, Carnegie Mellon University and Massachusetts Institute of Technology (MIT), both of which are in the US, offer full-fledged B.Tech programmes in AI. The new course will have 20 seats and the eligibility is clearing the JEE-Advanced test. "AI solutions are particularly promising for India (given the availability of a large corpus of data) where it can have a major positive impact on several critical domains such as healthcare, crop and soil management, weather prediction, surveillance and security, and defence," Sumohana Channappayya, Dean (Research and Development), IIT-H, said in a statement.

"However, the demand for professionals trained in this area far exceeds the current supply. The B.Tech programme in AI is a step in the direction of addressing this highly skewed demand-supply

scenario," Channappayya added. Further, Channappayya noted that the potential for AI to improve the quality of human lives is tremendous. This program will train students in the fundamentals of computer science, AI and ML, in addition to sensitising them to the ethical issues in deploying AI-based solutions.

The course will also focus on application verticals such as healthcare, agriculture, smart mobility, among many others. Students pursuing other degrees such as B.Tech in Chemical Engineering or Mechanical Engineering can now do a minor in AI as well from the coming academic year, the statement said.

Are we better equipped to assess air quality in 2019?

<https://www.downtoearth.org.in/blog/air/are-we-better-equipped-to-assess-air-quality-in-2019--62855>

The use of technology in addressing air pollution has been growing at an incredible pace, but then the scale of the problem has also grown and expanded with time

On January 10, 2019, as the Ministry of Environment, Forest and Climate Change was gearing up to launch the National Clean Air Program (NCAP), a group of researchers and entrepreneurs got together for the sixth edition of Social Entrepreneurs and Enterprises—an IIT Kanpur Alumni Association Initiative.

Interestingly, the theme for this year was finding implementable solutions for India's air pollution problem. Researchers from IIT Kanpur and Delhi presented their cutting-edge findings, which have the potential to shape the future of air quality assessment protocol and inform clean air policies in India.

Technologies ranging from sensor-based monitors to air purifiers to smog towers were presented. The organisers of the event remembered Anil Agarwal as the IIT Kanpur alumnus who authored the first State of Environment Report for India.

As a representative for the Centre for Science and Environment (CSE) at the event, I took up the opportunity to assess how this vast amount of research could complement or enhance the steps that are being taken by the government to combat the problem of air pollution.

For instance, the recently launched NCAP directs the 102 non-attainment cities in the country to formulate clean air plans. While the nature of sources across the cities tends to be similar, it is the relative contribution of the sources that varies from city to city.

In order to prioritise action and devise a time-bound action agenda, it would be imperative to assess the relative source contributions. Traditionally, source apportionment studies have been long-term experiments involving on-site sample collections using filter papers, and then off-site analysis of these collected samples using ion chromatography or exposing the collected samples to mass spectrometers.

Also, samples need to be collected on a seasonal basis to understand how the contributions of sources per season. The incredibly high particulate concentrations in Delhi during winters have irked citizens and researchers alike.

Professor Sachchida Nand Tripathi of IIT Kanpur has been studying Delhi's pollution for over a decade now and was kind enough to answer my questions on his on-going study, which involves assessment of Delhi's particulate matter composition and formation using quick source apportionment methods.

This could be a game changer as it can expedite the traditional long-term source apportionment studies. The study entails deployment of mass spectrometers at representative locations that are aligned with the predominant wind direction.

Tripathi is leading a team of researchers from IIT Kanpur, IIT Delhi, Indian Institute of Tropical Meteorology (IITM) Delhi branch, Paul Scherrer Institut and Manav Rachna International University to carry out a first of its kind study in India. Mass spectrometers have been deployed at three locations in Delhi, including the IIT Delhi campus, IITM Delhi branch and Manav Rachna University campus.

The mass spectrometer analyses secondary organic aerosols that constitute particulates in the atmosphere. The idea is to arrive at the age and chemical composition of these secondary aerosols. This information in turn helps identify the sources of these organic aerosols and the residence time of the particulates in the atmosphere.

The operation mechanism of this versatile equipment is rather complex. It fragments a concentrated particulate beam into ions of varying masses. The atomic mass unit (AMU) of an ion corresponds to a specific source, or in other words is the source signature.

For instance an ion having an atomic mass unit between 60 to 70 could possibly be generated through biomass burning. The mass spectrometer thus generates a time series of mass spectra which then gets analysed using a source apportionment model, thereby aiding the process of source identification.

In addition to the above analysis, something called isotope fractionation is also being carried out to distinguish between polluting process that can have a similar source signature. For instance, this could help distinguish between bio-fuel and fossil fuel combustion.

The IIT Delhi campus is also operating an additional 'electrospray ionization mass spectrometer'. This device could help identify source signatures of combustion of different kinds of oils being used in industries.

A 2017 Supreme Court order banned the use of furnace oil in Delhi-NCR. A device like this could help verify whether unauthorised and illegal use of such oil persists despite the ban.

Tripathi informs me about yet another equipment called the 'Proton transfer mass spectrometer' that could be used to identify sources behind volatile organic gases. These gases act as precursors for formation of secondary particulate matter in the atmosphere. Thus, apportioning these gases to their sources could also help identify possible causes of particulate pollution in a city.

Use of on-site mass spectrometers is a relatively new phenomenon. They have been in use since early 2000s. China is reportedly using hundreds of such mass spectrometers to continually assess its air quality. India has just started deploying these.

But can these be deployed at a large scale across the country? Probably not, given how expensive these instruments tend to be. The mass spectrometers that have been deployed in Delhi cost around Rs 6 crore. But, if these are produced within the country, the costs would come down significantly.

While use of advanced technologies to assess air quality is picking up in the country, forecasting air quality to predict air pollutant concentrations has also been on the radar of policy makers and advocates.

The IITM in Pune, under the Ministry of Earth Sciences (MoES), currently runs the System of Air Quality and Weather Forecasting and Research (SAFAR) to forecast air pollution trends in Delhi, Mumbai, Pune, and Ahmedabad. In October 2018, an early warning system was put in place by the MoES.

These forecasting models take emissions and meteorological parameters as inputs and generate pollutant concentrations on the basis of the same. Chemical transformations occurring in the atmosphere are also taken into account.

An emission inventory is essentially a summary of emissions from all possible sources of pollution and the results would certainly differ from that of a source apportionment study as all the emissions may not get translated into formation of particulate matter.

This discrepancy between results of an emission inventory and source apportionment has baffled policy makers in the country for a while and needs to be put to rest.

The use of technology in addressing issues related to air pollution has been growing at an incredible pace. But then the scale of the problem has also grown and expanded with time.

If experts are to be believed then the problem is here to stay, and the decline will be gradual and not instantaneous. Systemic measures, long term planning with emphasis on cleaner energy and cleaner production will be key to cleaner air in the country.

While we might be better prepared in understanding and demystifying air pollution than ever before, the preparedness has remained confined to Delhi. Cities across the Indo-Gangetic plain scream and smell of foul air as well as absolute inaction.

With the NCAP, cities are beginning to devise their clean air agenda, but a mere paper-bound agenda cannot be the only solution. Working out a mechanism to implement and monitor the action points, cross-sectoral and inter-departmental coordination and continuous monitoring and assessment of a city's air quality are absolutely essential to observe any discernible improvement on ground.

Cities looking at technologies like cloud seeding and smog towers as the solution to their air pollution problem need to understand that these are only interim solutions and will not eliminate the problem. Technology needs to be curative and not preventive.

Summing it all up, I would say that yes, a lot is happening, but all this might fall short given the scale of the problem. And I would like to reiterate that Delhi is not the only battleground. Take a look outside Delhi, it is pretty hazy out there!

January 16

Govt Plans to Set up Centres for Excellence at IIT-Kharagpur, IISc-Bengaluru: Young scientists to learn how to track weather events

<https://indianexpress.com/article/education/govt-plans-to-set-up-centres-for-excellence-at-iit-kharagpur-iisc-bengaluru-young-scientists-to-learn-how-to-track-weather-events-5540422/>

Citing the severe thunder and dust storm that had hit Delhi, Haryana and nearby regions last year, killing over 200 people, Rajeevan said the weather event was an “eye-opener”, and there was a need for software and algorithms to track specific weather events.

The Ministry of Earth Sciences (MoES) plans to set up two Centres for Excellence (CEC) to train young researchers in developing software and algorithms needed for monitoring specific weather events.

M Rajeevan, secretary, MoES announced recently in Pune that the first CEC would soon come up on the campus of IIT-Kharagpur and a similar one is in the pipeline, to be set up at the Indian Institute of Sciences (IISc), Bengaluru. “We have received a proposal from IIT Kharagpur and our team will be visiting the institute later this month to finalise the setting up of CEC,” said Rajeevan. He said a similar proposal from IISc was expected shortly.

Citing the severe thunder and dust storm that had hit Delhi, Haryana and nearby regions last year, killing over 200 people, Rajeevan said the weather event was an “eye-opener”, and there was a need for software and algorithms to track specific weather events.

“The CECs will undertake training for researchers and students, to develop hardware, software and algorithms. These will help track thunder, lightning, wind speed or similar weather phenomenon specifically, helping improve operational forecasts,” said Rajeevan.

A Centre for Excellence is among the latest initiatives undertaken by the MoES to develop human resources in the field of atmospheric sciences, both for operational and research purposes.

From the next academic year, city-based Indian Institute of Tropical Meteorology (IITM) is set to roll out fellowships and short-term courses, as well as conduct workshops through its dedicated Development of Skilled manpower in Earth System Sciences (DESK). Similarly, oceanic studies will be conducted at the Indian National Centre for Ocean Information Services (INCOIS). With the country’s radar network set to double in the next two years, the need for researchers to interpret the data will also be high.

“With enormous data getting generated, we will need to engage more students and researchers, and we will need to adopt newer type of scanning methods. This will be particularly needed to address some of the challenges posed by the country,” said K J Ramesh, director general of the India Meteorological Department.

January 15

IIT Gandhinagar students study science behind Indian art

<https://www.dnaindia.com/ahmedabad/report-iit-gandhinagar-students-study-science-behind-indian-art-2708052>

In one of the most innovative courses offered at the Indian Institute of Technology, Gandhinagar, students of cognitive science have tracked people's eye movements to perceive art. As part of a unique course titled 'Experimental Aesthetics', that blends science with art, students learnt how to look at artworks, especially those of Indian artists, through a scientific lens.

"This may be the first time that a course has introduced experimental and cognitive science perspectives to study art, and applied them to the Indian context," Dr Leslee Lazar, a visiting faculty at IITGn said. Dr Lazar, a cognitive neuroscientist, combines his knowledge of neuroscience with visual art to understand what makes great artwork tick. Lazar took up the idea of offering the course when a few of his students showed interest in studying art and science together. "The response was extremely positive, he says.

Students developed a foundation in art appreciation as the course introduced art history, placing Indian art within Western periods. Then, they went on to study psychological theories of art followed by recent work in Neuroaesthetics, a pioneering field that deals with how the brain sees art.

"I aimed to bring my students to a level where they can conduct their own experiments with art. This way, they can go on to explore scientific avenues with Indian art.", Lazar said.

Classroom discussions took the students on a journey through time: starting with the ancient sculptures of the Indus Valley Civilization, touching upon modern artists like Amrita Sher-Gil and the Tagore brothers, all the way up to contemporary artists like S. H. Raza, M. F. Husain and Anish Kapoor. "I was fascinated by Raza's work.", said a student, Dhwani Sadhphal" After taking this course, I have an idea why our brains are mesmerised by the geometric patterns in Raza's paintings"m she said.

As part of the course, the students also visited city-based art museums and learnt to analyse the paintings they had seen. For their final projects, the students used scientific techniques, like tracking people's eye movements at millisecond precision while they looked at art to learn how they perceive art.

ART OF THE MATTER

As part of the course, the students visited city-based art museums and learnt to analyse paintings they had seen. For final projects, the students used scientific techniques, like tracking people's eye movements at millisecond precision while they looked at art to learn how they perceive art.

IIT Kharagpur, University of Alberta Collaborate For Joint Doctoral Degree Programme

<https://www.ndtv.com/education/iit-kharagpur-university-of-alberta-collaborate-for-joint-doctoral-degree-programme-1978178>

In the programme, students will be working on collaborative projects and co-supervised by faculty members at both institutions, an IIT release said on Tuesday.

Indian Institute of Technology (IIT) Kharagpur and University of Alberta (UoA), one of Canada's top ranking university, have inked a pact to explore opportunities for a joint doctoral degree programme.

In the programme, students will be working on collaborative projects and co-supervised by faculty members at both institutions, an IIT release said on Tuesday.

The Memorandum of Understanding was signed on Monday.

The special scheme from Science and Engineering Research Board (SERB) and UoA will be explored where doctoral students at IIT KGP may receive funding for up to 12 months, to pursue joint research at UoA, the release said.

January 14

10% reservation will create thousands of seats in IITs and other higher institutes: Prakash Javadekar

<https://indianexpress.com/article/education/10-reservation-to-open-up-seats-in-iit-iiit-nit-prakash-javadekar-5537694/>

President Ram Nath Kovind has given his assent to the constitutional provision to provide 10 per cent reservation in government jobs and education to an economically backward section in the general category.

“In June, when institutions open (for next session), thousands of seats will be there under 10 per cent reservation in institutions like IIT, IIIT, NIT, central universities,” said Prakash Javadekar

The government’s 10 per cent reservation will create thousands of seats in higher education institutions. Union HRD Minister Prakash Javadekar on Sunday said that there will be thousands of seats in higher education institutions under the new category from the next academic session.

“In June, when institutions open (for next session), thousands of seats will be there under 10 per cent reservation in institutions like IIT, IIIT, NIT, central universities and others and my preparation has started,” Javadekar said.

The HRD Minister termed the government’s decision a move towards social justice. “This is a revolutionary decision to deliver economic justice and social justice,” said HRD minister at a function in Jaipur on Sunday evening.

He said that no one’s reservation was abolished and an additional 10 per cent reservation was given to economically backward sections of the general category, as reported by PTI.

IIT Madras ties up with Italian company for sustainable energy research

<https://www.indiatoday.in/education-today/news/story/iit-madras-ties-up-with-italian-company-for-sustainable-energy-research-1430669-2019-01-14>

IIT Madras tied up with Italian company Sotacarbo to boost India's sustainable energy research.



This tie-up between IIT Madras and Italian company Sotacarbo will help in boosting research in the sustainable energy sector.

Indian Institute of Technology (IIT) Madras entered into a research collaboration on sustainable energy with an Italian company, Sotacarbo - Società Tecnologie Avanzate Carbone SpA.

As part of this tie-up, researchers from both the organisations will take up three main projects: Biomass Gasification, catalysts for CO₂-to-methanol and syngas-to-methanol, and Combustion and Oxy-Combustion.

Which research groups would be working as part of the tie-up?

Research groups from the Department of Chemical Engineering, National Centre for Combustion Research and Development (**NCCRD**) and the National Centre for Catalysis Research (**NCCR**), IIT Madras, already visited the Sotacarbo campus in Italy and interacted with their team.

More about how this tie-up will benefit research

- The agreement is expected to spearhead extensive collaborative research projects that will explore synergies or common areas between the groups
- Through this collaboration, the two organisations will also look at some additional areas such as other energy technologies and carbon capture and storage
- A Joint Development Agreement (JDA) between IIT Madras and Sotacarbo was signed recently aimed at fostering collaborative research work between the two institutions in the areas of biomass and coal energy



Why is this tie-up important for sustainable energy research?

"Energy is an important focus of research in IIT Madras, and we welcome this opportunity to collaborate on the various identified areas on sustainable energy. We are grateful for your time and confident that our faculty teams will work very well and deliver beyond expectations," said Ravindra Gettu, Dean (Industrial Consultancy and Sponsored Research), a professor at IIT Madras, highlighting the importance of this collaboration.

Speaking about the collaboration, Dr Gianni Serra, Sotacarbo Director of International Relations, said, "**It was a no brainer to begin working together (with IIT Madras) as we have so many areas of interest in common.** It's early stages to say but the first signs are all promising. This JDA will be beneficial to both sides, paving the way for new projects and exchange of both young researchers and students."

Preeti Aghalayam, a professor in the Department of Chemical Engineering, IIT Madras, is coordinating this tie-up. The agreement and meetings were facilitated by Dr. Bhima Sastri, an IIT Madras alumnus.

Why was IIT Madras specifically chosen for the tie-up with the Italian company?

Dr. Alberto Pettinau, Sotacarbo Scientific Director, said, "We picked IIT Madras because we appreciate their high level of experience in the same fields of research that are strategic for Italy and the Sardinian Region. **This research needs a multidisciplinary approach and Sotacarbo and IIT Madras bring to the table different expertise and know-how, which can easily complement themselves.**"

Sotacarbo is a public owned limited company based in Sardinia, Italy, which has been working in the area of sustainable energy research and has been a vibrant contributor to the landscape for the past several decades.

IIT Madras faculty from various departments have wide expertise in biomass and coal gasification, combustor design and diagnostics and catalysis.

About IIT Madras

Indian Institute of Technology Madras (IITM) was established in 1959 by the Government of India as an institute of national importance.

The activities of the Institute in various fields of Technology and Science are carried out in 16 academic departments and several advanced interdisciplinary Research Academic Centres.

MoU signed with German varsity for academic exchange

<https://www.tribuneindia.com/news/himachal/mou-signed-with-german-varsity-for-academic-exchange/713311.html>

The Indian Institute of Technology (IIT), Mandi, and Leibniz Universitat Hannover (LUH), Germany, has signed a memorandum of understanding (MoU) for academic exchange between both educational institutions in the near future.

The MoU was signed by Professor Timothy A Gonsalves, Director of IIT, Mandi, and Professor Dr Iur Volker Epping, president of Leibniz Universitat Hannover, in Germany. The MoU is aimed at mutual benefit by conducting joint research activities and exchanging academic materials. It will pave the way for exchanging of students and academic and administrative staff between the two institutions. Gonsalves said under this MoU, both institutions would develop joint teaching and research projects in future. The visiting scientists will be given an appropriate workplace with ancillary equipment. He said the students would be enrolled according to their academic background and a mutually recognised curriculum would be developed and the hosting institution would help in their academic, social and cultural integration. The MoU between the two institutions is for five years and can be renewed further. “Since 2011, the IIT, Mandi, has had a strategic partnership with the TU9 in Germany to tap into the German excellence in engineering and science. Many of our faculties now, have research collaborations with TU9 institutions, including Leibniz Universitat, Hannover. This MoU will spur the collaboration with LUH to a higher plane and will enable bilateral exchange visits by many students”, he remarked. TU9 is an alliance of the leading universities of technology in Germany, which includes RWTH Aachen University, TU Berlin, TU Braunschweig, TU Darmstadt, TU Dresden, Leibniz Universität, Hannover, Karlsruhe Institute of Technology, TU München and University of Stuttgart.

Space club wins bronze at tech meet

The IIT-Mandi’s Space Technology and Astronomy Club (STAC) won a bronze medal in the star cluster identifier Hackathon in the Inter-IIT Tech Meet, held at the Indian Institute of Technology, Bombay. A total of 22 teams of various IITs participated in the competition. A team of four students—Shreyas Bapat, third year student, Indresh Kumar, fourth year student, Swapnil Sharma, fourth year student and Akash Dakoor, second year student from the School of Computing & Electrical Engineering made a project on “Star Cluster Identifier” within six hours, on the spot.

Mini maths talent search programme

The Mini Mathematics Training and Talent Search (MTTS) Programme was organised at the IIT-Mandi to promote mathematical thinking and expose young minds to the excitement of doing mathematics. The programme is one of the most popular and significant training programmes for the undergraduate/postgraduate students in India. The main objective of this programme is to motivate and inspire students to pursue their career in mathematics and mathematical research and enjoy the excitement of mathematics through discovery of the basic mathematical results on their own. A total number of 28 undergraduate students from Himachal Pradesh, Punjab, Haryana and Maharashtra participated in the programme.

Faculty development programme

A faculty development programme on high-performance computing was organised at the IIT, Mandi. Computational research can act as a fabric that connects different domains of knowledge such as various branches of engineering, physical, chemical, as well as biological sciences. The goal of the workshop was to provide the attendees, which were the young faculty members or senior research scholars from different institutions of Himachal Pradesh and Jammu & Kashmir in particular and across the country in general, with a focused and in-depth platform for presentations, discussion and interaction in the field of high-performance computing (HPC). Around 40 participants attended the workshop.

January 13

Kumbh Mela: IIT-Bangalore Team to Research, Document Event Using Demographics

<https://www.india.com/education/iit-bangalore-team-to-document-conduct-field-research-on-kumbh-mela-using-demographics-3523887/>



IIMB to conduct field research, document and publicise the way Kumbh Mela is managed. (File Photo)

Indian Institute of Management-Bangalore (IIMB) has been authorised to carry out field research on the Kumbh Mela by the host of the event, Prayagraj Mela Pradhikaran. The Kumbh Mela will, therefore, be documented and publicised by the institute. This year, the 55-day-event is scheduled to commence on January 15 in Prayagraj (Allahabad).

One stream of research will document and analyse the way the socio-cultural event is managed while the other stream will focus on themes that are unique to the event. The aim of the study is to find out how government departments, private vendors and the civic society arrive at an optimal state of service and delivery. Therefore, the research team is entrusted with the task of recording the plan and design of service-delivery ahead of the event. Once the documentation of the plan is done, the team will look out for possible structural gaps in the implementation of the plan during the Kumbh Mela.

In addition to analysing the use of technology and innovation at the event, the research team of IIMB will hunt other sources of digital data that will be created at the socio-cultural event. Prof. G Ramesh of the Centre for Public Policy in IIMB reportedly said that the various departments of the institute will render their services to the Kumbh Mela. This year, the team from IIMB, with the help of a private sector are adopting technology to make their research possibilities interesting, added the professor. Prof. Ritu Tripathi, from the Organisational Behaviour and Human Resources Management, and Prof. Prateek Raj, from the strategy area at IIMB, are part of the team.

The various demographic factors that would be taken into consideration to understand the Mela include youth, women, old visitors, newcomers, tourists and NRIs, stated a report. Research on sanitation and cleanliness will also be undertaken.

January 12

IIT-KGP honours 10 alumni for contribution to institute

https://www.business-standard.com/article/pti-stories/iit-kgp-honours-10-alumni-for-contribution-to-institute-119011200743_1.html

Ten alumni of the IIT-Kharagpur were honoured for their contribution to the institute for facilitating global networking and reach, leading collaborative projects and other activities at the 16th Annual Alumni Meet being held at the institute campus.

The recipients included Ratun Lahiri and Davender Jain who were from abroad.

Lahiri is a finance expert from London, who had founded UK Chapter - a 330-member organisation having strategised events to attract participation from the alumni, an IIT KGP statement said Saturday.

Jain had spearheaded joint conference for all IIT directors including IIT KGP with Vice-chancellors of premier Australian universities to promote research, faculty exchange and the IIT brand in Australia.

Among the recipients from India who were felicitated, there are alumni like Sabesh Subramaniam, former President of Chennai Chapter and who has been actively involved with CSR funding for the Sandhi (Science-Culture initiative) project.

Another such alumni was Prof Probir Gupta, former Dean of the Vinod Gupta School of Management and the founding Head of the Rajiv Gandhi School of Intellectual Property Law.

A key initiative during the Meet being held from January 11-13 was awarding of the Distinguished Service Award as each of these alumni contributes a significant amount of their time to work for alumni associations in various parts of the world, the statement said.

The IIT KGP's 'halls of residence' (hostels) have been major beneficiaries this year, with seven 'halls' receiving more than Rs 1.5 crore from the alumni for development activities.

"The 1969, 1979, 1994 and 1997 batches have collectively donated Rs. 3.6 crore in endowment on the occasion of the Annual Alumni Meet this year," Dean Chattopadhyay said.