How a broom maker helped trio from IIT-D make drones to light up Rajpath


Light show using 1,000 drones to commemorate 75 years of India's Independence, during the 'Beating the Retreat' ceremony at Vijay Chowk, in New Delhi on January 29, 2022.  | Photo Credit: PTI

What went behind pulling off a 1000-drone show on Rajpath

The sky over Rajpath on Saturday lit up in a kaleidoscope of colours as a swarm of 1,000 drones painted 3-D images of Bapu with his walking stick, the tricolour and the map of India. The brain behind the event were two IIT-Delhi alumni and their professor who spent six months to design and manufacture the drones and prepare different animations to be recreated in the sky.

Tanmay Bunkar and Anuj Kumar Barnwal, physics graduates from IIT Delhi, co-founded their startup Botlab Dynamics along with Dr Sarita Ahlawat in 2016. Their aim was to replace big, expensive drones with simpler and cheaper drones that can perform the same tasks and carry the same
payloads by forming a network or collaborative aerial system. Over time they received funding from the Department of Science and Technology and I-Hub Foundation for Cobotics (IHFC) at IIT-Delhi.

On Saturday, the sky over Rajpath was their canvas and drones their paintbrushes with which they brought to life different patterns to mark the 75 years of Independence. These included a giant three-dimensional globe, an ascending tricolour, the map of India with the Ashok Chakra in the centre, among others. This was an elaborate process that took several months to just conceptualise and design.

"We thought of a concept in which we would show six to seven patterns. This had to be then converted into an animation on a computer. This is a very time consuming exercise and each animation can take up to two weeks. And then we run this animation through simulations to ensure that drones don’t collide with each other and account for factors like speed of the air. After this we feed the programme into each drone and then take them to the ground and carry out test flights," explains Dr. Ahlawat.

It was in July last year that the Ministry of Defence told Botlab Dynamics that they would be part of the Republic Day celebrations and that they had to aim for 1,000 drones. Until then, Tanmay and co had never handled more than 80 drones simultaneously.

"Reliability of these drones was key to ensuring that the show goes smoothly. We have 1,000 drones to pull off a show, but we don’t have 1,000 people to maintain each drone, carry out a pre-flight check, etc. That is a luxury we just didn’t have. So, we decided we will make drones ourselves so that we know the causes of different errors and failures," says Tanmay Bunkar.

Soon they started ordering parts and assembling the hardware. But this was the time that world’s supply chains had snapped up and shortages of different parts such as semi-conductor chips began to hit different industries. This forced the team to look for alternatives within the country. That’s when they found someone in Manesar who made motherboards for mobile phones and asked him to make printed circuit boards.

The outer casing of the drones was made by a maker of fruit baskets and broom handles in Seelampur, recounts Tanmay. The end product were drones that were nearly 80% made in India, including important parts like flight controllers (or the brain of the drones), GPS precision and motor controller.

"In India we need this capability. We need know how. We can’t just be a service provider through startups like Zomato and Swiggy. We can’t keep relying on the outside world for electronic based hardware and high speed trains, computers, lithium ion batters. I am happy that through our participation for R-Day celebrations we have been able to shine light on the need for hardware-based solutions," says Dr. Ahlawat.

Ask them what’s next for the startup and Tanmay says he will be selling drone shows and that he is already flooded with inquiries from big brands who want to a big-bang launch for their products as well as Ministries who want to promote their schemes.
IIT Delhi study shows path to hospitals struggling with sustainable medical waste disposal


This IIT Delhi study has shed light on how hospitals struggling with sustainable medical waste disposal can select the right firm for the work.

IIT Delhi researchers led by professor Dr. Surya Prakash Singh from the Department of Management Studies in a study have thrown light on how hospitals can select a sustainable medical waste disposal firm.

Researchers say that the hospitals, which often encounters the difficulty in disposing their medical waste in a hygienic and sustainable way, can utilize a decision support framework proposed in their study.

Researchers say that the hospitals, which often encounters the difficulty in disposing their medical waste in a hygienic and sustainable way, can utilize a decision support framework proposed in their study.

The research paper titled ‘Selection of Healthcare Waste Disposal Firms Using a Multi-Method Approach’ by Prof. Surya Prakash Singh and his collaborator Dr. Ankur Chauhan, Jaipuria Institute of Management, Noida, India was published in the Journal of Environmental Management

Why proper medical waste disposal is crucial during Covid-19

The research study shows the path to facilitate the hospitals with a real-time decision support framework considering numerous criteria and constraints for the selection of healthcare waste disposal firm(s).

In Covid times, this becomes more relevant due to the increasing amount of healthcare waste and its hazardous and infectious composition such as syringes, masks, PPE kits, face shield, scalpels, bandages, blooded cottons, heavy metals, and chemicals etc.
The World Health Organization (WHO) has also advocated considering these wastes different from other wastes such as non-hazardous municipal solid waste.

How does the study help with the sustainable medical waste disposal issue?

“The aim of this study is to propose a hybrid multi criteria decision support framework integrated with mathematical model to tackle the issue of safe disposal of hazardous and infectious healthcare waste,” Prof. Surya Prakash Singh, Department of Management Studies, IIT Delhi said.

“The study shows a direction to the hospital management in selecting economically, socially, and environmentally sustainable healthcare waste disposal firm. Literature of the last twenty-five years has been carefully sifted through for leads in the identification of the selection criteria,” he said.

Key factors for selecting the best sustainable medical waste disposal firm

This study identifies ten key success factors from literature and field survey for selecting the best healthcare waste disposal firm.

Findings reveal that experience of the firm, technology for disposal and waste collection infrastructure acts as a cause in selecting a healthcare waste disposal firm.

The key factors the study advises looking for before finalising a healthcare waste (HCW) disposal firm include:

1. Manpower of a particular outsourcing firm.
2. Cases filed in a court of law against the HCW outsourcing firm.
3. The cost of providing services by an outsourcing firm to a particular hospital.
4. The reputation of existing clients of HCW outsourcing firm.
5. Number of years for which an outsourcing firm has been functional.
6. The technology available with an outsourcing firm for disposal and recycling of HCW.
7. HCW collection instruments and vehicles available with outsourcing firm.
8. Training and awareness programs about HCW provided to housekeeping staff and patients.
9. Capacity planning for recycling of HCW collected by outsourcing firm.
10. Risk associated with the handling and disposal of HCW.

The study undermines the ‘Cost factor’ as the only determining criterion for the selection of HCW disposal firms.
The study concludes that the risk management policy of the HCW firms has the highest significance in the selection and the cost charged by the HCW firm has the lowest significance when the HCW is outsourced to a single firm for disposal.

Study conducted in North India cities

Hospitals in an Indian city in the northern region of India have been considered for the study, thus making it very relevant to the urban HCW problem.

While it provides a ready-to-adopt model for HCW collection firm selection in this context, it also lays the basis for future work in other contexts such as a rural setup or other geographical regions of India.

The study provides a robust decision-making framework for the hospitals to select the right medical waste disposal firm.

“The decision model proposed by the study empowers the hospitals in the selection of the right firm for HCW disposal in a rational manner, reducing the confrontations between the various stakeholders such as hospitals, HCW firms, and environmental regulatory bodies like Central Pollution Control Board (CPCB), etc., thus creating a situation of peaceful co-existence, Prof. Surya Prakash Singh added.

The researchers believe the outcomes of the study will have ramifications for policymakers in the health sector, hospitals, and entrepreneurs involved in the medical waste collection and reuse and environment regulating agencies.

IIT Delhi’s Honorary Professor Conferred With Padma Shri Award 2022


IIT Delhi’s honorary professor, Prof Dr Dilip T Shahani, has been named for the Padma Shri Award 2022.

The Indian Institutes of Technology (IIT) Delhi’s honorary professor, Prof Dr Dilip T Shahani, has been named for the Padma Shri Award 2022, one of the highest civilian awards of the country, for his contribution to the field of education. Announcing the award, the institute on Wednesday took to the microblogging site, Twitter and also congratulated the professor for this achievement.

A silver medalist from IIT Kharagpur, and PhD from IIT Delhi, Dr Dilip T Shahani has served as faculty at IIT Delhi for over four decades and now continues to be associated with the Institute as the honorary professor, informed the institute.

“During his tenure, the prof served on the position of HoD twice. He has also received awards for ‘Excellence in teaching’ and ‘Technology development and transfer in electromagnetic systems’. He has a string of successful R&D projects for Defence & Industry,” the institute added.
Since 2016, he along with eminent faculty from IIT Bombay and IIT Bhilai has been engaged in mentoring the latest EVM design for the Election Commission of India.

The prof has also been involved in numerous administrative assignments at IIT Delhi. He has also been associated as a technical expert to the Election Commission of India for several years. This is not the first award that he is being conferred, earlier in 2017, he was awarded National Award for best Electoral Practices.

An IIT Kanpur alumnus, Dr Anil K Rajvanshi has also been awarded Padma Shri for his contribution as a grassroots scientist. He has worked for sustainability and rural development. Some of his prominent work includes renewable energy-based cooking and lighting, power generation from agricultural residues, electric cycle rickshaws, water purification and effluent treatment through renewable energy among others.

**What is Universe Made of? IIT Delhi Professors to Help School Kids Answer in SciTech Lecture Series**

**January 27, 2022**  

IIT Delhi speakers will throw light on the world of elementary particles during the lecture titled 'The Building Blocks of Matter: From Particles to Strings.'

The Indian Institute of Technology (IIT) Delhi will conduct the fifth lecture for school students under the SciTech Spins Lecture Series on January 29. Speakers will throw light on the world of elementary particles during the lecture titled ‘The Building Blocks of Matter: From Particles to Strings.’

The lecture will focus on fundamental building blocks of nature and the laws of physics, which govern their behaviour. The contributions that lead to the current understanding of particle physics and questions that still puzzle the scientific community will be highlighted, said the institute.

“The world we see is made up of atoms. However, the atom is not a fundamental object. It is made up of protons and neutrons inside the nucleus and the electrons revolving around it. If one looks closer into the protons and neutrons, we find they are made up of mysterious particles called quarks. Thus, the quarks and the electrons constitute the elementary building blocks of nature. But nature works in mysterious ways. It made two more copies of the electrons and the quarks, and this constitutes the world of elementary particle physics,” said IIT Delhi.

It is the second part of the series ‘Unraveling Nature: From the Galaxies to the Quantum Realm’. Prof Abhishek Muralidhar Iyer and Prof Tarun Sharma from the Department of Physics, IIT Delhi will address the students. The lecture will also be live streamed on IIT Delhi’s official YouTube channel.
SciTech Spins is an academic outreach initiative by the institute for school students especially from classes 9 to 12. IIT Delhi will provide e-certificates to all registered students nominated by their respective schools who attend the lecture.

The institute will also invite these students to ‘Open House’, an annual intellectual fest organised by IIT Delhi, which provides an ideal platform for school students to connect with some of the leading researchers in the field of science and technology. Schools will be able to reach out to associate dean, academic outreach, and new initiatives, IIT Delhi (adoni@iitd.ac.in; acadoutreach@iitd.ac.in) to nominate their students for the SciTech Spins lecture series.

IIT Delhi startup develops advanced fabric for monumental National Flags, prototypes installed in Delhi and Ladakh


IIT Delhi startup SWATRIC has developed several advanced fabric structures for monumental National Flags that increase the strength. Prototypes of such monumental national flags have been installed in Delhi and Ladakh.

IIT Delhi startup SWATRIC has developed several advanced fabric structures for monumental National Flags that increase the strength.

IIT Delhi startup SWATRIC has designed several advanced fabric structures for the monumental National Flags or Tiranga. At the lab scale, the researchers have successfully improved the strength of the fabric by 100%.

Last year, SWATRIC and the Flag Foundation of India (FFI) had joined hands with an aim to filter the best possible fabric design and structure for the monumental national flags to suit India’s diverse climatic and geographical conditions.
Using the advanced fabric being developed by IIT Delhi startup, the FFI has already installed two different prototypes of the monumental National Flag on the field -- one in Delhi and another one in Ladakh.

**Flag material made durable in extreme weather conditions**

“The aim is to make the monumental flag material durable for extreme weather conditions without being too heavy. Next month, we are also sending 10 different prototypes to different locations in the country for installation,” said Prof. Bipin Kumar, Textile and Fibre Engineering Dept, IIT Delhi, and Mentor, SWATRIC.

“So far, our research is at prototyping stage, the exact durability of the flag will be known in the next few months,” he badded.

**Monumental National Flag on IIT Delhi campus**

IIT Delhi is also in the process of installing a monumental National Flag on its campus. The project is expected to complete by March 2022.

Naveen Jindal, Founder, Flag Foundation of India and Chairman, Jindal Steel & Power limited (JSPL) and IIT Delhi alumni have come forward to contribute to the project.

On January 24, 2022, IIT Delhi hosted an online event ‘Pride for Tiranga’ where Naveen Jindal highlighted some essential facts associated with the National Flag.

He also spoke about the legal battle he fought which resulted in a Supreme Court verdict on January 23, 2004, in which the Hon’ble Court said that flying of the National Flag is the Fundamental Right of an Indian citizen within Article 19(1) (a) of the Constitution of India that grants freedom of speech and expression.

**IIT Delhi working with Flag Foundation of India**

Prof V. Ramgopal Rao, Director, IIT Delhi said, “IIT Delhi faculty members have been closely interacting with the Flag Foundation of India, a non-profit organization founded by Naveen Jindal.”

“They are looking at multiple aspects related to the National Flag. They are working closely to develop material standards for monumental flags and a lot of field trials are currently on. I am glad to know that the initial results are encouraging,” he added.

The Flag Foundation of India is a non-profit body registered under the society’s registration act of 1980. It has a primary vision to popularize the display of the Tiranga (Tricolor) by more and more Indians, with a great sense of pride.

**Flipkart partners with IIT Delhi for joint research in social commerce**
The study will entail research in the fields of social commerce, product recommendations to sellers, resellers and the consumer product exploration journey.

Walmart backed e-commerce giant Flipkart said that it has signed a memorandum of understanding (MoU) with the Foundation for Innovation and Technology Transfer (FITT), the industry interface organisation of the Indian Institute of Technology, Delhi (IIT-D) as a part of its ongoing Industry-academia collaboration program.

The study will entail research in the fields of social commerce, product recommendations to sellers, resellers and the consumer product exploration journey.

As a part of the research, Flipkart will offer research grants and market insights to FITT. This will provide IIT and the academia involved in the partnership an opportunity to work closely with Flipkart on research projects aimed at solving relevant technical challenges in the e-commerce domain, the e-tailer said in a statement.

Flipkart and FITT will also jointly undertake a number of other initiatives, including organising seminars, offering conference travel grants and internship and mentorship opportunities. This MoU is a step to strengthen Flipkart’s academic collaboration program, which it has been nurturing for the past five years.

These collaborations have the aim of creating industry-focused applied research on some of the most compelling problem statements of online commerce, which can make e-commerce accessible to more consumers and sellers alike.

According to a report by Recogn in November 2021, India is likely to have 228 million native
consumers through social commerce by the end of 2022, a 45 per cent jump from the 2021 user base. This necessitates research and understanding about how the next set of consumers will explore e-commerce through social interaction, and also learn about user contributions on product recommendations in this journey.

“As an organisation committed to solving for India, we have developed numerous industry-first capabilities over the years and continue to push the boundaries to bring customer delight and create shared value for the ecosystem partners. In this endeavour, we are pleased to partner with IIT Delhi to co-develop capabilities that play a pivotal role in revolutionising the future of social commerce. This will also provide an opportunity to the students, scholars and professors to gain real-world expertise and build innovative solutions that lead to ecosystem development,” Mayur Datar, Chief Data Scientist at Flipkart, said.

Flipkart said that it is vested in long-term advancement of universities in India and fostering collaborations through impactful academic research aligned to industry needs to bring forth India-specific solutions. It has earlier forged several academic partnerships with leading institutes, including the Indian Institute of Science (IISc), IIIT Hyderabad, IITs (Kharagpur, Patna, Bombay and Kanpur) and IIMs (Ahmedabad and Kolkata). Flipkart also works with a few foreign universities such as Carnegie Mellon University and the University of California, San Diego

“FITT engages with industry to strengthen research translation and knowledge transfer for socio-economic empowerment. In this context, we are pleased to partner with Flipkart, a homegrown e-commerce marketplace to explore open innovation opportunities towards creating valuable business solutions for millions of customers,” Anil Wali, Managing Director, FITT said in a statement.

Collaborative research projects have led to the development of a range of technologies such as fashion recommendation, query understanding, attribute extraction, demand planning, product categorization, review helpfulness, supply chain management (e.g., warehouse storage allocation), fraud detection, and machine translation. Several research papers have been published as a result in top academic conferences of ML/AI applications such as information retrieval (IR), knowledge discovery, data mining and natural language processing (NLP), according to an official statement.

IIT-Delhi sensors to record air quality in neighbourhoods

A new IIT-Delhi project will explore the use of sensors that can be connected to people’s home Wi-Fi system and collect real-time air quality data.

The sensors will give an accurate picture of the air quality in a neighbourhood, which could vary from the data recorded by a monitoring station located at some distance, Prof Sagnik Dey of IIT Delhi, a researcher working on the Nasa Citizen Science Project, said.

“The idea is to deploy thousands of low-cost sensors in neighbourhoods so the data can be analysed,” Dey added.
“When 30 such sensors were deployed at IIT-Delhi, there were a lot of variations within the campus itself. For instance, the data recorded from a sensor close to the main road differed vastly from the rest of the campus,” the professor said.

Dey said it was critical that every house has the sensors to collect hyper-local data in a city like Delhi, which would help analyse the quality of air one is exposed to. The researchers plan to approach schools in the city as well, he added.

“We plan to engage with schools in NCR too later. If people are aware of the exposure to pollution, they will think of ways to tackle it. Appropriate solutions can then be found to reduce the exposure of children as they could be returning to schools soon,” Dey said.

The data collected from the sensors will be available online and accessible to all. But first, it will need to be calibrated, he told TOI.

“We are also trying to come up with other censors that can measure personal exposure and contribute to health studies. People have shown keen interest in the project,” Dey said. He added that while various types of censors are currently available, several start-ups are also in the process of developing others that can be deployed.

Union Minister Dr Jitendra Singh says, TDB-DST supported, IIT-Delhi based start-up ‘Botlab Dynamics’ to light up the sky with 1000 Drones
Light Show at ‘Beating the Retreat Ceremony’ on 29th January
Union Minister of State (Independent Charge) Science & Technology Dr Jitendra Singh today said, Botlab Dynamics Private Limited, a start-up supported by Technology Development Board, under DST and incubated at Indian Institute of Technology, Delhi will light up the sky with 1000 Drones Light Show at ‘Beating the Retreat Ceremony’ on 29th January.

Dr Jitendra Singh said, under the leadership of Prime Minister Narendra Modi, Drone Technology has come a long way from delivering vaccines to difficult areas to lighting up the Rajpath during Beating the Retreat Ceremony. He said, India will be the 4th country after China, Russia & UK to carry out such a large scale show with 1000 drones.

Dr Jitendra Singh said, Botlab in association with Ministry of Defence has conceptualized the novel ‘DRONE SHOW’ to commemorate the 75th year of Independence. He said, the drone show will be 10 minutes long in duration, and will showcase government achievements @75 through many creative formations in the dark sky.

The project has been developed indigenously within the country, developing all the necessary components, including both hardwares and softwares such as the flight controller (brain of the drone); precision GPS; motor controller; Ground Control Station (GCS) algorithms etc.

Secretary, DST, Dr S. Chandrasekhar said, to give a boost to Start-ups eco-system, Prime Minister Narendra Modi recently declared 16th January as the National Start-up Day on the special occasion of Azaadi ka Amrit Mahotsav, when India is celebrating 75th Year of Independence and Government of India’s flagship initiative ‘Start-up India’ completed 6th successful year of supporting Start-up movement in the country.

He said, Botlab Dynamics Private Limited was financially supported, for the project “Design and Development of a Reconfigurable Swarming System Consisting of 500-1000 Drones for 3D Choreographed Drone Light Shows”.

TDB was constituted with a unique mandate to provide financial assistance to Indian industrial concerns and other agencies, attempting development and commercial application of indigenous technologies, or adapting imported technologies to wider domestic applications.

Rajesh Kumar Pathak, IP&TAFS, Secretary, TDB stated that, “Botlab is one of such unique Start-ups, which will play a significant role in taking the drone manufacturing sector to new levels. We are proud to support such company, which will make a unique contribution to this special occasion of Amrit Mahotsav”.

TDB has been playing a significant role in bringing new opportunities and horizons for Start-up ecosystems in India. TDB believes that, Start-ups have an essential role to play in country’s economic, scientific and technological growth.

**IIT Delhi campus: Covid positive students feel at home**

*January 21, 2022*  

From isolation wards to availability of ambulance and even testing centre on campus, IIT Delhi has most facilities in place to help students within the premises who are battling the third Covid wave.
IIT Delhi hostellers have Covid testing and isolation facilities on their campus.

The rapid spread of Covid-19 in the city has made its way to the hostels of Indian Institute of Technology Delhi as well. Though quite a few students have gone back to their homes, but there are still some who continue to stay in the hostels. And these students say that the campus is like a home away from home for them because the institute is leaving no stone unturned in taking care of those who are turning Covid positive.

**Quarantine centre and testing facilities**

Students who experience symptoms of Covid-19 don’t have to step out of the premises, even to get themselves tested. The institute has created a testing centre as well as an isolation ward for the students on campus. “A friend of mine attended a house party recently and then started experiencing Covid symptoms from the very next day,” says Rohan Sharma, a final year student of textile technology, adding, “My friend was immediately tested at the RT PCR centre in our campus and then an ambulance took her to the isolation ward, which is actually the Gulmohar guest house. If the capacity exceeds there, then the ambulance drops off the patients at another quarantine facility outside the campus. My friend stayed at Gulmohar for seven days and is back now after recovering. It was really nice to see how well she was taken care of.”
Students have the provision to get tested for Covid while being within the campus premises.

In room service during quarantine

Before a student is taken to the isolation centre, they are asked to quarantine in their rooms. “During this time, the institute has been providing room service of food and other necessities,” says Abhinav Gupta, a fourth year student of textile and fibre engineering. He adds: “All Covid precautions are being followed. If there is someone who is quarantined in his room, food is delivered right till the doorstep by the college authorities. They pack whatever is cooked in plastic containers, so that those can be discarded later. Also, proper cleanliness is being maintained.”

Individual rooms to not mess slots

Prevention is better than cure and the students of IIT Delhi say that their college management is making sure to keep it safe for all of them during this time. “We have all been allotted individual rooms and are not required to share the room with anyone. This helps as it reduces the chance of transmission of the virus. Also, we are supposed to wear a mask at all times, even while using the common washroom. Although I just hope there was someone to make sure that quarantine is not broken, maybe someone could patrol,” adds Gupta.

And Saurabh, a final year student of production and industrial engineering, says, “Our mess committee has divided the dining hours into four slots, and assigned two wings per slot. Normally we can go and eat between 8am to 10am, Noon to 2pm, and 7pm to 9pm. But now, to fight the rise in Covid cases, they’ve bifurcated the available eating slots in segments. This works for us all.”

Prof Soumitra Dutta, Alumnus of IIT Delhi, to be Dean of Oxford Business School

He is currently teaching management at the Cornell SC Johnson College of Business at Cornell University in New York.

Professor Soumitra Dutta has been appointed as the new Dean of Saïd Business School, in the University of Oxford, and will take over on 1 June this year.

He is currently Professor of Management at the Cornell SC Johnson College of Business at Cornell University in New York, of which he was also the founding Dean.

Professor Dutta said that he was "delighted to be joining Saïd Business School at Oxford University."

"My daughter Sara graduated from Oxford and both my wife Lourdes and I spent a fruitful half-year sabbatical at Oxford. We are both looking forward to being part of this diverse, exciting and innovative community," he added, as quoted in the press release issued by Oxford University.

He is a Distinguished Alumnus of the Indian Institute of Technology, Delhi, and is also the co-founder of the Networked Readiness Index (published by the World Economic Forum) and the Global Innovation Index (published by the World Intellectual Property Organisation).

Additionally, Professor Dutta has been a senior advisor to governments on technology and innovation policies.

The Vice-Chancellor of the the university, Professor Louise Richardson, while commenting on Professor Dutta's appointment, said that he was delighted that the latter had accepted the offer. "I am delighted that Professor Dutta has accepted our offer to become the next Dean of Saïd Business School. He brings a global perspective, wide-ranging experience and deep knowledge of technology and of business education. I look forward to working with him."

Professor Peter Tufano will be the one making way for Professor Dutta after being the Dean for Saïd Business School for ten years.

**Beating Retreat to have show of nearly 1,000 drones by IIT-Delhi startup**

The annual Beating the Retreat ceremony, which takes place in the national capital on January 29, will have a show of nearly 1,000 drones by a IIT-Delhi-based startup

Moreover, for the first time, on the parapet of the north block and the south block, there will be a laser projection mapping show to commemorate 75 years of independence, they added.

This is the first time that the Beating the Retreat ceremony will have a laser show and a drone show, the officials said.

These two shows will take place in addition to the foot-tapping music and classical renditions that are there every year at the ceremony, they said.

The officials said Botlab, a startup from IIT-Delhi, will put up the drone show with nearly 1,000 drones.

It will be themed on 75 years of independence.

India will be the fourth country to conduct a drone show of this size that has been designed and conceptualised indigenously, the officials said.

China, Russia and the United States are the three other countries that can put up a drone show of this size, they added.

The Beating the Retreat ceremony marks a centuries-old military tradition, dating back to the days when troops disengaged from a battle at sunset.
As soon as the buglers sounded the "retreat", the troops ceased fighting, sheathed their arms and withdrew from the battlefield.

**IIT-Delhi researchers develop technology to reduce chemo side-effects**


Researchers from Indian Institute of Technology (IIT) Delhi have developed a technology for chemotherapy applications using the red blood cell membrane, which will help in personalised therapy and also reduce side-effects.

According to senior officials of the institute, the technology involves engineering the RBCs in the lab to produce smaller biocompatible vesicles. "Drug molecules can simply be trapped inside the particle's lipid bilayer and circulate for a longer time. At present, few synthetic nanoparticles being used in nanomedicine suffer from short circulation times and are often associated with non-specific toxicity," they said.

The research work by professor Neetu Singh and Sahil Malhotra from IIT Delhi’s Centre for Biomedical Engineering utilises the long circulating nature of the RBCs to address a long standing problem of drug delivery, of substantially prolonged drug circulation by delaying the recognition by immune cells.

Delving further into the research, Singh said, "The concept here utilises body's own cells to load multiple drugs at the same time and reach the tumour sites in significant concentrations. Interestingly, this nano-RBCs platform has synthetic tenability similar to other polymeric systems or the commonly used liposomes but have proved to be more efficacious."

Singh further explained, "We were intrigued by nature's own oxygen delivery vehicle, the RBCs, as these are also the longest circulating cells. However, achieving complete control over the physical and chemical properties of a natural system similar to the way we can control a synthetic system is..."
challenging. Over the last few years, we have successfully demonstrated the utilisation of RBCs for
drug delivery and developed strategies where the naturally derived vesicles can be tuned for
various applications."

**IIT Delhi to Set-up Office of Diversity and Inclusion, Creates New Dean Position**

*January 16, 2022*  

*The new office will work on gender, sexuality, caste, language, disability, and mental health to foster greater inclusion, says IIT Delhi.*

The Indian Institute of Technology (IIT) Delhi has created a new Dean position for the Office of Diversity and Inclusion. As per the IIT Delhi board resolution, the institute will be establishing the office which will be headed by the new dean. The step has been taken to create a more inclusive environment on the campus.

"Through this we seek to celebrate existing diversity on campus, to document its benefits to the community and to create a more inclusive environment for everyone," reads the official notice by director Prof V Ramgopal.

The new office will work on gender, sexuality, caste, language, disability, and mental health to foster greater inclusion. The notice also added that much of this work is currently being done at the institute including the Initiative for Gender Equality and Sensitization (IGES) and the office of accessible Education (OAE) for students with disabilities. The new office will consolidate the ongoing activates and sensitize the campus community to the campus needs.

This work is important as “our Constitution, above all, is an essay in the acceptance of diversity. It is founded on a vision of an inclusive society which accommodates plural ways of life," added the notice.

The director also said that the institute’s counselling services have been extended to all members and are not just for students. "The number of IIT Delhi community members reaching out to them has been rising, indicating a positive change in health-seeking behaviour for mental health issues," he added. The dean of the Office of Diversity and Inclusion is expected to provide visibility, leadership, and coherence and to ensure that the work is done in a more sustained manner, the official notice added.

**IIT Delhi to Hold First PMRF Symposium On January 15**

*January 14, 2022*  

*The PMRF symposium will be live streamed on the YouTube channel, the live streaming is scheduled to start at 9:45 am.*
The Indian Institute of Technology (IIT Delhi) will conduct the first Prime Minister’s Research Fellows (PMRF) symposium on Saturday (January 15). Prof. K. VijayRaghavan (Principal Scientific Advisor to Govt. of India) and Prof. Manindra Agrawal (IIT Kanpur) will address the symposium.

The symposium will showcase some of the outstanding work done by the PMRF fellows. "There will be two parallel tracks of presentations from PMRF fellows along with a third poster/video session," the release mentioned. The symposium will be live streamed on the YouTube channel, the live streaming is scheduled to start at 9:45 am.

The Prime Minister’s Research Fellows (PMRF) Scheme has been designed for improving the quality of research in various higher educational institutions in the country. With attractive fellowships, the scheme seeks to attract the best talent into research thereby realising the vision of development through innovation.

The institutes which can offer PMRF include all the IITs, all the IISERs, Indian Institute of Science, Bengaluru and some of the top Central Universities/NITs that offer science and/or technology degrees.

Earlier in 2018, Union Cabinet approved the PMRF scheme under which 1000 best students with the eligibility criteria mentioned above will get direct PhD admission with fellowship ranging from Rs 70000 to 80000. In addition to this, a research grant of Rs.2.00 lakh will be provided to each of the Fellows for a period of 5 years to cover their foreign travel expenses for presenting research papers in international conferences and seminars.

**IIT Delhi, NLU studying impact of technology, AI on judicial processes**
NLU Delhi and IIT Delhi are collaborating on research projects that involve using technology to smoothen the processes of delivering justice.

In a first-of-its-kind collaboration in the country, two elite schools in the domains of law and engineering are coming together to integrate law and technology for better legal outcomes.

Researchers and postgraduate students of National Law University (NLU) Delhi and the Indian Institute of Technology (IIT) Delhi are conducting joint research in the fields of law, social science and technology with the aim of bringing transparency in legal judgements.

“We have already taken the specific step and that is the initiation of joint research by the researchers of IIT Delhi and NLU. So, as part of that NLU Delhi and IIT Delhi have called for applications for submission of Joint Research Projects,” said Arul George Scaria, associate professor, law and co-director of the Centre for Innovation, Intellectual Property and Competition (CIIPC) at NLU Delhi.

These joint research projects will study how law and technology can be integrated for better judgement processes.

Each of the multi-institutional, inter-disciplinary projects will receive a grant of Rs. 20 lakh, to be split between the two institutions. Two joint projects have already been finalized – on law and artificial intelligence and another on forensic sciences. Taken together, they will receive a total grant of Rs. 40 lakh from the two institutions. Rs. 20 lakh will be given for the first year and the rest after the submission of the report.
Arul George Scaria, associate professor, law and co-director of the Centre for Innovation, Intellectual Property and Competition (CIIPC) at NLU Delhi

Artificial intelligence

One of the projects looks at the use of algorithms in law. Scaria of NLU Delhi and Nandana Sengupta, assistant professor, School of Public Policy at IIT Delhi will work on exploring probable algorithmic biases in the decision-making process. According to the Oxford Dictionary, an algorithm is a “set of rules that must be followed when solving a particular problem”.

Scaria explained that when a court of law uses algorithms in a judicial process, some bias could creep into the final outcome. This is applicable for other entities that use algorithms as well. “So we are basically exploring through this joint research project what the potential challenges are and how we can address those.”

Sengupta’s team in IIT Delhi is trying to understand how AI can be utilized in social science settings, especially in law and public policy. The team hopes to provide technical inputs to understand the nuances of fairness and justice.

IIT Delhi will also look into the impact of AI on society at large.

The institute will undertake a survey to understand the attitude of the public and legal communities towards artificial intelligence in decision-making. “What we want to do is something which has not been done in India yet. This is to understand the attitudes of the youth towards the use of algorithms,” said Sengupta.

“There has to be a match on what is being done by the legal community and what is being done by the technical community. Since it will deal with society, there will always be policy implications. So, IIT Delhi will also try to understand how to find the common questions and also to find the gaps that are not being addressed by the computer scientists or the lawyers,” she added.
Though it is a faculty-driven project, research assistants and doctoral students will also contribute to it. The project will also have a framework that is contextualized for India.

The researchers hope the project will lead to better policy making. “If lawyers are making policies relating to technology without knowing the technological background, it can be a disaster. Similarly, if people engage in the development of technology without understanding the legal implication, there might be a major disaster for society. It’s a mutually beneficial partnership which can be beneficial for society,” added Scaria.

Vivekanandan Perumal, assistant professor, Kusuma School of Biological Sciences, IIT Delhi

**Forensic science and technology**

Another collaborative project is in the area of forensic sciences. This is to enhance scientific methods for the better preservation of samples gathered from crime scenes. Vivekanandan Perumal, assistant professor, Kusuma School of Biological Sciences, IIT Delhi will work closely with Shreya Rastogi, research associate, NLU Delhi, on it. While Perumal has expertise in molecular biology and diagnostics, Rastogi’s forte is crime scene investigation.

Perumal and his team will work on dealing with forensic samples. “We are trying to do the best we can in terms of collecting a sample, finding the best methods of storing a sample in a cost-effective manner and the best methods for nucleic acid extraction.”

In India, sample degradation happens fast due to the varying weather conditions and other factors which adversely affect the final legal outcome. Also, DNA (deoxyribonucleic acid) extraction is critical for forensic analysis and has major application in the criminal justice system.

Forensic scientists can compare DNA found at a crime scene (from blood, saliva or hair) to DNA samples taken from suspects. If there is no match, the suspect can be ruled out. If there is a match, police will further probe into it.
“Inability to process that evidence or loss of DNA would affect the quality or quantity. We are trying to see what we can do in the laboratory to enhance and streamline that,” added Perumal.

Rastogi’s team in NLU Delhi is working on understanding how the pieces of evidence are analysed in courts. This will help them understand the importance of criminal casework. “We had proposed a project which is regarding the collection of evidence through swabs from crime scenes. And to see the impact of that in criminal casework, the current conditions of the police malkhanas [where very old papers, confiscated weapons, gold and money are stored], hospitals and forensic science laboratories [which, too, have old records and reports],” said Devina Sikdar, research associate, NLU, Delhi.

As a first step, Rastogi’s team will study the time-frame of a criminal case – when the alleged crime took place, the legal process involved, how the evidence is analysed, and how they impact the final outcome. “We will be going to police malkhanas, government hospitals, government laboratories and forensic science laboratories in Delhi to look through the registers,” said Sikdar. Once the legal processes are analysed, IIT Delhi will take over. “Dr. Perumal will be looking at the swabs that we have from our survey and study how the degradation happens.”

Rangan Banerjee named new IIT-Delhi director, V Kamakoti for IIT-Madras

Rangan Banerjee will succeed the incumbent IIT-Delhi director V Ramgopal Rao. Professor V Kamakoti will succeed Bhaskar Ramamurthi as the director of IIT-Madras.

Professor Rangan Banerjee (L) and Professor V Kamakoti (R) have been appointed directors of IIT-Delhi, and IIT-Madras, respectively
Rangan Banerjee, a professor at the Indian Institute of Technology (IIT), Bombay, was appointed the new director of the IIT-Delhi on Monday while professor V Kamakoti was named as the next director of IIT-Madras.

V Ramgopal Rao, the incumbent IIT-Delhi director, announced his successor’s name in a tweet on Monday. “I am happy to inform you that Prof. Rangan Banerjee from the Department of Energy Sciences & Engineering, IIT Bombay has been appointed as the next Director of IIT Delhi. Hearty congratulations and best wishes to Prof. Banerjee,” he said.

Officials at the ministry of education confirmed Banerjee’s appointment. “Banerjee’s name has been cleared as the next IIT-Delhi director. A notification in this regard will be issued on Tuesday,” said an official.

Meanwhile, professor V Kamakoti will be the next director of IIT-Madras, the institute announced on Monday. He will succeed Bhaskar Ramamurthi, who is stepping down after completing two terms, an official release said.

**Rangan Banerjee appointed new director of IIT-Delhi**


**Banerjee has expertise in energy science and engineering**

Rangan Banerjee, professor of Indian Institute of Technology (IIT) Bombay, has been appointed director of IIT-Delhi.

Ramgopal Rao, the outgoing director of IIT-Delhi made the announcement on social media on Monday evening and congratulated Mr. Banerjee on his appointment.

Prof. Banerjee, a Forbes Marshall chair professor in the Department of Energy Science and Engineering at IIT-Bombay, confirmed his appointment while speaking to The Hindu.

Mr. Banerjee started his academic career as an assistant professor at the Indira Gandhi Institute of Development Research, Mumbai in 1992 before joining IIT-Bombay in 1993. He became an assistant professor in 1997 and professor in 2003. He helped in starting the Department of Energy Science and Engineering at IIT-Bombay in 2007 and his interest areas include energy management, modelling of energy systems, energy planning and policy, hydrogen energy and fuel cells, according to his profile on the IIT-Bombay website.

Prof. Banerjee was a member of the working group on New and Renewable Energy for the eleventh and twelfth Five-Year Plans and a member of the Planning Commission's Integrated Energy policy. He has been involved in advising the city, state regulatory commission and energy agency, the Planning commission, Niti Aayog, and Ministry of New and Renewable Energy.

He has co-authored books on several topics — planning for demand-side management in the power sector, energy cost in the chemical industry and engineering education in India. He has been honoured with Excellence in Teaching Award by IIT Bombay and is a Fellow of the Indian National...
Academy of Engineering. He is also an adjunct faculty (honorary) in the Department of Engineering & Public Policy, Carnegie Mellon University.

Need for more research funding: IIT Delhi chief

HIGHLIGHTS
OU Vice-Chancellor’s Awards presented to Dr V. Srilatha (Political Science); Dr Bheem Bhukya (Microbiology); Dr KCHE VIdyasagar (Bio-medical Engineering) and Dr Harish Gupta (Geology) t J Raju, an alumnus of the Osmania University, donated funds for awards

In a historic first, Osmania University gave away the Vice-Chancellor's Awards for Research Excellence by faculty members here on Monday at the Tagore Auditorium on the OU campus.

The awardees were: Dr V Srilatha (Political Science); Dr Bheem Bhukya (Microbiology); Dr KCHE VIdyasagar (Bio-medical Engineering) and Dr Harish Gupta (Geology). J Raju, an alumnus of the Osmania University donated funds for the award.

Prof V Ramgopal Rao, Director, IIT Delhi, who was the chief guest, lauded the alumni for sponsoring the research award. He pointed out that research is crucial and called for more research funding in the country.

"Research leads to knowledge creation which in turn creates wealth by encouraging technology start-ups. Also, innovation is possible when faculty members are encouraged to engage in research," he observed, Prof D Ravinder, OU Vice-Chancellor, traced the genesis of the idea of the Vice-chancellor Award for research and said it is crucial that individuals involved in research and development got their due recognition.

He said OU has produced 'leaders' in diverse fields and not "followers" and urged members to strive to enhance the varsity's reputation and change misperceptions among the public Prof R Limbadri, Chairman, TSCH, and guest of honour, appreciated the idea of rewarding researchers in the university which will boost the morale of others and contribute to society Dr K Thangaraj, CDFD director, another guest of honour, underlined the need for taking up collaborative research projects involving multiple institutions Earlier, in his welcome address, Prof P Laxminarayana, OU Registrar, stressed upon the importance of research in universities and the institution of the Vice-Chancellor's Award to recognise the research talent of the university. Deans, principals, directors, heads of the departments, chairpersons of the board of studies, alumni invitees and faculty members attended the event.

IIT Delhi Launches STEM Mentorship Program for Schoolgirls; Apply Here
Indian Institute of Technology (IIT) Delhi’s initiative aims to encourage more girls to take up Science, Technology, Engineering, Mathematics (STEM) as a career.

IIT Delhi has come up with a Science, Technology, Engineering, Mathematics (STEM) Mentorship Program for female Class 11 students. This program aims to encourage more girls to take up these fields as a career.

This three-level program will include 10 girls in one batch, each of them monitored by an IIT Delhi faculty along with their research scholars. The course is supposed to make the students think creatively and explore their respective fields with first-hand experience.

Professor Pritha Chandra, associate dean, academic outreach and new initiatives of IIT- Delhi, said to Times of India, “The programme will give girl students some required traction for getting into the field of technology in the future. We believe that students should be exposed to scientific concepts at an early age, to be able to appreciate the rigour of academic research and to build up the confidence to take up academics as a career choice when they grow up.”

Things to know:

The first level of the course is a two-week winter project which began at the end of December 2021 and ends in early January 2022.

The second level consists of an online lecture series with modules in Chemistry, Physics, Biology, Mathematics and some Engineering branches. This ends by April 2022.

The summer project or the third level will be conducted for three to four weeks from May to June where students get hands-on experience in labs.

The project areas will cover different disciplines of science and engineering like computer science, chemistry, mechanical engineering, physics and biological sciences.

Foundational concepts in STEM disciplines and experimental methods and techniques used in science labs are taught in the program.

How to apply:

As of now, the program is available to students of Kendriya Vidyalaya, Delhi region.

Schools can select interested students and reach out to the Associate Dean, Academic Outreach & New Initiatives, IIT Delhi at adoni@iitd.ac.in or acadoutreach@iitd.ac.in.

Soon the program will be turned into a residential one and have participation from students from other regions as well.

IIT Delhi alumnus Vivek Vaidya to gift Rs 10 crores to institute’s endowment fund

The Indian Institute of Technology (IIT) Delhi’s alumnus Vivek Vaidya has pledged Rs 10 crores to the endowment fund of the institute. He has already transferred Rs 2.25 crores as a first instalment of his contribution to IIT Delhi.

Vaidya received an MS degree in Mathematics and Computing from IIT Delhi and an MS in Computer Science from the University of Denver, USA. He is a serial entrepreneur and technology leader who has built industry leading technology companies in enterprise software, data management, analytics, and machine learning or Artificial Intelligence (AI) over the last 25 years, as per an official statement from the institute.

Currently, he is the co-founder, general partner, and CTO of Super{set}, a start-up studio that finds, funds, and builds data driven technology companies. He also serves as the co-founder and CTO of another company Ketch and Markov ML.

V Ramgopal Rao, director, IIT Delhi and Chairman, IIT Delhi Endowment Management Foundation, welcomed Vaidya’s association with the endowment fund as a founder and said: “Looking at the progress made by the IIT Delhi Endowment Fund in just over 2 years of its launch, there is no doubt that this initiative has turned out to be a milestone event in the Institute’s history. We are happy to welcome Vivek Vaidya as a founder member of Endowment Fund and look forward to Vivek's active involvement in the Institute activities and future growth plans”.

IIT Delhi’s alumnus Vaidya received an MS degree in Mathematics and Computing from the institute.
Arun Duggal, an esteemed alumnus and Co-chairman, IIT Delhi Endowment Management Foundation said, “I would like to extend my heartiest welcome to Vivek as founder in IIT Delhi Endowment Fund. It is great to have a distinguished professional like him join the Founder group to give back to our alma mater”.

Recognizing the generosity of Vaidya, PV Madhusudhan Rao, Dean, Alumni Affairs, IIT Delhi said that more and more alumni are coming forward to support the institute and this will greatly help in our aspiration to become one of best institutes worldwide.

IMA, IIT Delhi, among 6,000 entities whose FCRA licence deemed to have ceased


IIT Delhi, Jamia Milia Islamia, Indian Medical Association and Nehru Memorial Museum and Library are among nearly 6,000 entities whose FCRA registration deemed to have ceased on Saturday. These entities either did not apply for renewal of their FCRA licence or the Union Home Ministry rejected their applications, officials said According to the official website […]

The FCRA registration is mandatory for any association and NGO to receive foreign funding.

IIT Delhi, Jamia Milia Islamia, Indian Medical Association and Nehru Memorial Museum and Library are among nearly 6,000 entities whose FCRA registration deemed to have ceased on Saturday. These entities either did not apply for renewal of their FCRA licence or the Union Home Ministry rejected their applications, officials said According to the official website […]

According to the official website related to the Foreign Contribution (Regulation) Act, among organisations and entities whose registration under the FCRA ceased or validity expired include the Indira Gandhi National Centre For Arts, Indian Institute Of Public Administration, Lal Bahadur Shastri Memorial Foundation, Lady Shri Ram College for Women, Delhi College of Engineering and Oxfam India.

The officials of the Union Home Ministry, which regulates the activities of the NGOs and associates registered under the FCRA, said that registration under the act is deemed to have ceased on
Saturday (January 1). The FCRA registration is mandatory for any association and NGO to receive foreign funding.

There were 22,762 FCRA-registered NGOs till Friday. On Saturday, it came down to 16,829 as 5,933 NGOs ceased to operate.

Among those organisations whose FCRA registration ceased were Medical Council of India, Emmanuel Hospital Association, which runs over a dozen hospitals across India, Tuberculosis Association of India, Vishwa Dharamayatan, Maharishi Ayurveda Pratishthan, National Federation Of Fishermen’s Cooperatives Ltd.

The Hamdard Education Society, Delhi School of Social Work Society, Bhartiya Sanskriti Parishad, DAV College Trust and Management Society, India Islamic Cultural Centre, Godrej Memorial Trust, The Delhi Public School Society, Nuclear Science Centre in JNU, India Habitat Centre, Lady Shri Ram College for Women, Delhi College of Engineering and All India Marwari Yuva Manch are also among these entities.