IPS Academy

INSTITUTE OF ENGINEERING & SCIENCE

Knowledge, skills and values

MECHAZINE

Department of Mechanical Engineering

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2018-19

Letter from the Editors

Dear Readers,

We are very glad and gratified presenting the fourth issue of ***Mechazine*** e-magazine of the Department of Mechanical Engineering. We created it to be entertaining and informative, at times contrary, but above all useful. Inside you'll find a mixture of news, features and regular columns on a wide range of science-related topics along with some fresh poetry. It is created by the very talented students of our department only. From showing talent to getting exposure, it contains everything that is useful for you.

We take this opportunity to thank our respected Principal **Dr. Archana Keerti Chowdhary,** HOD **Dr. Sanjay Jain** and all the faculty members for their incessant inspiration and kind support.

We know that it will be given same warmth as previous editions and hope that we will get reviews to make it more lovable.

Editors…

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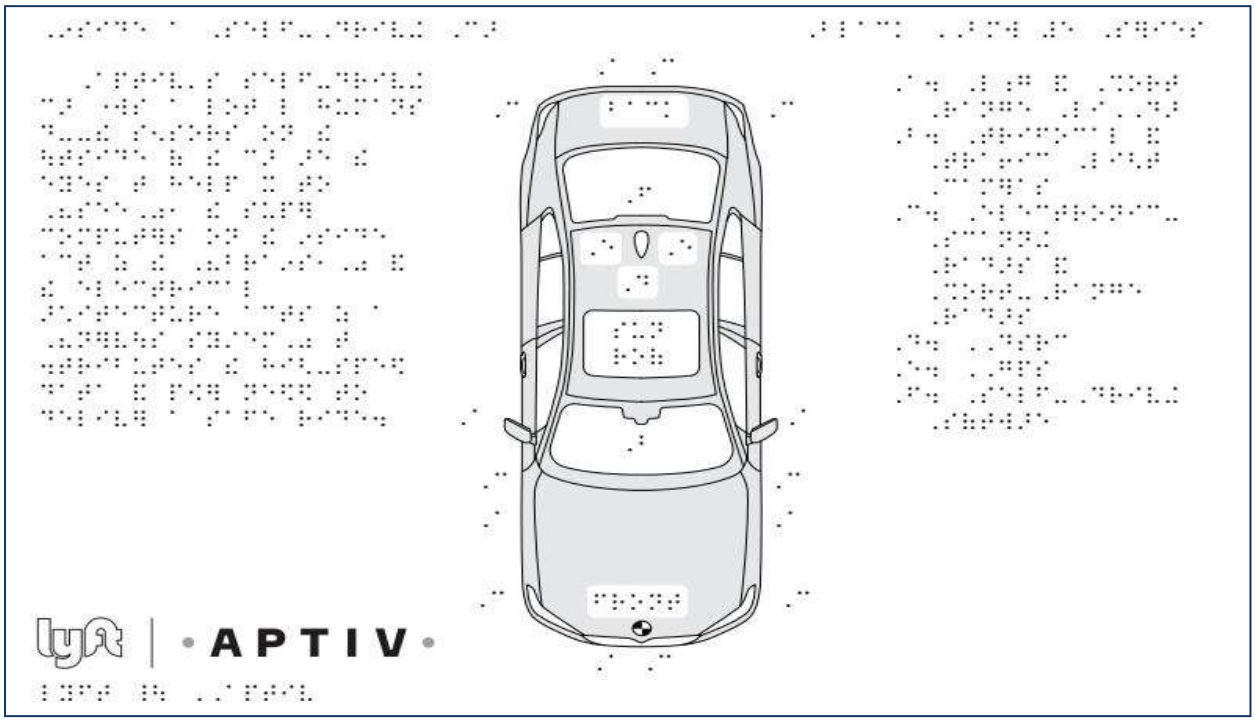
STUDENT ARTICLES

Now the time came when visually impaired can also sense the automobile..

Last week, the National Federation of the Blind held its annual conference in Las Vegas, and during the event, ride-hailing service Lyft gave brief trips in self-driving cars to around 50 people who are blind or low-vision.

Autonomous vehicles have perception, or vision, systems designed to allow the car to see the real world around them. That way, it can (hopefully) carry out critical driving maneuvers like slamming on the brakes if a pedestrian steps in front of it. A self-driving car transporting a person with limited or no vision is a great example of a controversial technology's promising uses—a machine that takes the wheel when a human cannot, and a smart intersection of tech and accessibility.

But the tech can remain mysterious, scary, or intimidating to people who haven't experienced it before (and have different levels of trust in technology). Part of the demystification process involves simply learning how the system works. The self-driving Lyfts in Vegas were operated by a company called Aptiv, and in those vehicles, a person sitting in the back seat can see a screen that shows what the autonomous car's sensors are seeing. Communication tools like that between the machine and the



This braille diagram illustrates where sensors including lidar, radar, and cameras are on a self-driving car.San Francisco's LightHouse For the Blind and Visually Impaired's Media and Accessible Design Lab

human's are an important way to build trust.

"When you're a sighted person, and you get into the car, you get to actually see what the car is 'seeing,'" says Marco Salsiccia, a consultant with Lyft and an accessibility specialist who is blind. "You get to see where all the sensors are—you get to visually take in all the information." But a person who is blind cannot see that screen, of course, nor can they get a visual tour of the sensors on the outside of the vehicle.

So to make up for that communication gap, Salsiccia, Lyft, and the Lighthouse for the Blind and Visually Impaired in San Francisco's Media and Accessible Design Lab came up with a paper guide to the vehicles that explains through braille how they work—the document illustrates where the car's lidar units, cameras, radars, GPS unit and its computer system are located. It explains what all those sensors and other pieces of hardware actually do, and how they work.

After they took a trip in a vehicle, the blind and low-vision riders had the chance to feel the braille guide to the vehicle they had just ridden in; they also got to check out a braille map that illustrated the ride they'd taken. A Lyft spokesperson says that the tactile guide to how a self-driving car works will be left in the autonomous Aptiv cars for blind or low-vision riders who might cruise with them in the future—a guide for how the driving machine sees, readable by touch.

Right now, self-driving cars are parts of fleets operated by companies—Waymo has a self-driving taxi service in the Phoenix, Arizona area, for example. So while autonomous cars aren't the types of vehicles people can own yet—leaving aside services like Tesla's Autopilot, which isn't a full self-driving feature—the concept of self-driving cars holds understandable appeal for the blind community. "The ultimate idea of the self-driving car, for those of us who are blind and low-vision, is it demonstrates pure mobility and independence," Salsiccia says. "You have a lot of blind people that drove before they lost their vision—you have a lot of people that just want that experience to be able to do something by and for themselves."

Ultimately, riding in a self-driving car shouldn't feel, or be, any different from a vehicle piloted by a responsible human. But that doesn't detract from just how cool the idea of a short trip down and back down the asphalt in Las Vegas is in an autonomous vehicle. "Just feeling the car changing

lanes and negotiating that u-turn—it just feels so natural and smooth," Salsiccia says.

Akshat Gupta (3rd Year)

Engineers develop chip that converts wasted heat to usable energy

University of Utah mechanical engineering associate professor Mathieu Francoeur has discovered a way to produce more electricity from heat than thought possible by creating a silicon chip, also known as a "device," that converts more thermal radiation into electricity. His findings were published in the paper, A Near-Field Radiative Heat Transfer Device, in the newest issue of *Nature Nanotechnology*.

Researchers have previously determined that there is a theoretical "blackbody limit" to how much energy can be produced from thermal radiation (heat). But Francoeur and his team have demonstrated that they can go well beyond the blackbody limit and produce more energy if they create a device that uses two silicon surfaces very close together. The team produced a 5mm-by-5mm chip (about the size of an eraser head) of two silicon wafers with a nanoscopic gap between them only 100 nanometers thick, or a thousandth the thickness of a human hair. While the chip was in a vacuum, they heated one surface and cooled another surface, which created a heat flux that can generate electricity. The concept of creating energy in this manner is not unique, but Francoeur and his team have discovered a way to fit the two silicon surfaces uniformly close together at a microscopic scale without touching each other. The closer they are to each other, the more electricity they can generate.

"Nobody can emit more radiation than the blackbody limit," he said. "But when we go to the nanoscale, you can."

In the future, Francoeur envisions that such technology could be used to not only cool down portable devices like laptops and smartphones but also to channel that heat into more battery life, possibly as much as 50% more. A laptop with a six-hour charge could jump to nine hours, for example.

The chips could be used to improve the efficiency of solar panels by increasing the amount of electricity from the sun's heat or in automobiles to take the heat from the engine to help power the electrical systems. They could also be designed to fit in implantable medical devices such as a

pacemaker that would not require replaceable batteries.

Another benefit is such technology can help improve the life of computer processors by keeping them cool and reducing wear and tear, and it will save more energy otherwise used for fans to cool the processors. It also could help improve the environment, Francoeur argued.

"You put the heat back into the system as electricity," he said. "Right now, we're just dumping it into the atmosphere. It's heating up your room, for example, and then you use your AC to cool your room, which wastes more energy."

Story Source:

Materials provided by **University of Utah**.

Journal Reference:

John DeSutter, Lei Tang, Mathieu Francoeur. **A near-field radiative heat transfer device**. *Nature Nanotechnology*, 2019; DOI: 10.1038/s41565-019-0483-1

Prashant Sharma (4th Year)

Successful application of machine learning in the discovery of new polymers

A joint research group including Ryo Yoshida (Professor and Director of the Data Science Center for Creative Design and Manufacturing at the Institute of Statistical Mathematics [ISM], Research Organization of Information and Systems), Junko Morikawa (Professor at the School of Materials and Chemical Technology, Tokyo Institute of Technology [Tokyo Tech]), and Yibin Xu (Group Leader of Thermal Management and Thermoelectric Materials Group, Center for Materials Research by Information Integration, Research and Services Division of Materials Data and Integrated System [MaDIS], NIMS) has demonstrated the promising application of machine learning (ML) -- a form of AI that enables computers to "learn" from given data -- for discovering innovative materials.

Reporting their findings in the open-access journal *npj Computational Materials*, the researchers show that their ML method, involving "transfer learning," enables the discovery of materials with desired properties even from an exceeding small data set.

The study drew on a data set of polymeric properties from PoLyInfo, the largest database of polymers in the world housed at NIMS. Despite its huge size, PoLyInfo has a limited amount of data on the heat transfer properties of polymers. To predict the heat

transfer properties from the given limited data, ML models on proxy properties were pre-trained where sufficient data were available on the related tasks; these pre-trained models captured common features relevant to the target task. Re-purposing such machine-acquired features on the target task yielded outstanding prediction performance even with the exceedingly small datasets, as if highly experienced human experts can make rational inferences even for considerably less experienced tasks. The team combined this model with a specially designed ML algorithm for computational molecular design, which is called the iQSPR algorithm previously developed by Yoshida and his colleagues. Applying this technique enabled the identification of thousands of promising "virtual" polymers.

From this large pool of candidates, three polymers were selected based on their ease of synthesis and processing.

Tests confirmed that the new polymers have a high thermal conductivity of up to 0.41 Watts per meter-Kelvin (W/mK). This figure is 80 percent higher than that of typical polyamides, a group of commonly used polymers that have been mass-produced since the 1950s for applications ranging from fuel cells to cookware.

By verifying the heat transfer properties of the computationally designed polymers, the study represents a key breakthrough for fast, cost-effective, ML-supported methods for materials design. It also demonstrates the team's combined expertise in data science, organic synthesis and advanced measurement technologies.

Yoshida comments that many aspects remain to be explored, such as "training" computational systems to work with limited data by adding more suitable descriptors. "Machine learning for polymer or soft material design is a challenging but promising field as these materials have properties that differ from metals and ceramics, and are not yet fully predicted by the existing theories," he says.

The study is a starting point for the discovery of other innovative materials, as Morikawa adds: "We would like to try to create an ML-driven high-throughput computational system to design next-generation soft materials for applications going beyond the 5G era. Through our project, we aim to pursue not only the development of materials informatics but

also contribute to fundamental advancement of materials science, especially in the field of phonon engineering."

Story Source:

Materials provided by **Tokyo Institute of Technology**.

Journal Reference:

Stephen Wu, Yukiko Kondo, Masa-aki Kakimoto, Bin Yang, Hironao Yamada, Isao Kuwajima, Guillaume Lambard, Kenta Hongo, Yibin Xu, Junichiro Shiomi, Christoph Schick, Junko Morikawa, Ryo Yoshida. **Machine-learning-assisted discovery of polymers with high thermal conductivity using a molecular design algorithm**. *npj Computational Materials*, 2019; 5 (1) DOI: 10.1038/s41524-019-0203-2

Aman Ghadge (2nd Year)

Kerala engineers who developed robot to clean manholes are on a mission to end manual scavenging

Manual scavenging is outlawed in India, yet thousands of people are still engaged in the work and many die cleaning sewers. According to the Safai Karmachari Andolan, a movement to eradicate manual scavenging, at least 1,470 manual scavengers died at work between 2010 and 2017. There are an estimated 1.8 lakh people in the country working as manual scavengers.

Now, though, a group of engineers from Kerala may have found a way to end the

Bandicoot cleans a manhole during the trial run in Thiruvananthapuram. Photo courtesy Genrobotics

"dehumanizing practice". They have designed a spider-shaped robot that cleans manholes and sewers with precision. Called Bandicoot, it has already successfully completed a trial run in Thiruvananthapuram, unclogging five manholes filled with plastic, filth, medical waste and sediments.

The robot, which takes 15 minutes to clean small sewers and around 45 minutes to unclog bigger ones, was developed by Genrobotics, a company founded by nine young engineers in Thiruvananthapuram two years ago. "Our ultimate aim is to end manual scavenging in India," said Vimal Govind, the company's 25-year-old chief executive officer. "It is time to change manholes to roboholes."

Following the successful trial earlier this month, the Kerala Water Authority has decided to use Bandicoot to clean all sewers in Thiruvananthapuram.

Ray of hope

India has enacted two laws – the Employment of Manual Scavenging and Construction of Dry Latrines Prohibition Act, 1993 and the Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013 – to eventually eradicate the practice of manually cleaning, carrying and disposing human excreta and garbage from sewers. Yet, manual scavengers across India still clean sewers at great risk to their lives. Most of the time, they are not provided the mandatory safety gear by their employers, largely municipal agencies, making them vulnerable to fatal accidents. Even a protective cap is a luxury for most of them, let alone jackets, gloves and masks. As a consequence, many die from inhaling poisonous gases accumulated inside manholes, oxygen depletion, heat stress or from falling down the pit. The overwhelming majority of manual scavengers are from Dalit communities. It is a harrowing life.

Bandicoot, thus, is a ray of hope. It only requires a person to operate it from a safe distance. The 80-kg robot lifts the heavy metal cover on its own, drops its arm into the manhole, scoops out the solid waste and dumps it in a bucket. “All operations can be viewed on a monitor,” Govind explained. “The robot can also be used to check the sewage apart from jetting the sewer lines.”

Genrobotics plans to teach manual scavengers to operate the robot with the aim of rehabilitating them. “Bandicoot will make the life of manhole cleaners safer,” Govind said. “It will help them earn a decent living without fear of losing jobs and lives. It will also break the caste system. Bandicoot will ensure manholes in India will remain clean without losing human lives.”

In good company

In 2015, nine mechanical engineering students from MES Engineering College in Kuttippuram, Malappuram, to explore the possibility of developing robots. “All of us are passionate about robotics and we began to exchange ideas and the group was immediately given the name Team Genrobotics,” Govind said. “We decided to retain the name when we launched the company in 2016.”

The idea was to build on a powered exoskeleton they had developed in the final year of college and which had won them many accolades. A powered exoskeleton is a wearable mobile machine that allows limb movement with increased strength and endurance. Such machines are used by soldiers to carry heavy objects and by fire fighters during emergency operations.

An illustration of Bandicoot lifting a manhole cover. Photo courtesy Genrobotics

After finishing college in 2016, they began to work on developing medical and industrial exoskeletons. But paucity of funds hampered them. “In order to raise funds we began to work for different firms,” said Govind.

In 2017, the Kerala Startup Mission, a start-up incubator launched by the state government, offered to fund their project. “Our robotics dream got wings once again and we regrouped soon,” Govind said.

A bright idea

The team then went to meet the state’s Information Technology Secretary M Sivasankar to discuss their ideas. Quite unexpectedly, he asked the engineers whether they could develop a robot to clean manholes. “A manual scavenger’s photograph published in a newspaper that morning triggered his suggestion,” Govind said. “We readily agreed.”

They set to work immediately, studying the different types of manholes, speaking to manual scavengers to understand the cleaning methods and watching documentaries and videos on manual scavenging. “It helped us understand the scourge of manual scavenging,” Govind said. “We decided to go ahead with the project as we felt it was high time we ended the practice.”

In one documentary, Govind heard a manual scavenger saying God had made them to do this work. “The statement shocked me,” he recalled. “At that time I decided that it was my duty to rescue these people from this deadly job.”

The team officially started work on the project in June 2017 and launched Bandicoot's beta version in January 2018. "We are indebted to Kerala Startup Mission and the Kerala Water Authority for helping us realize our dream," Govind said.

The research and development work was done and the robot was assembled at the Kerala Water Authority's office in Thiruvananthapuram. "We procured the components, except the advanced camera and waterproof material, from different parts of India and customized them for our needs," Govind said. "Approximate coast of one robot is Rs 10 lakh but the price will come down when it is mass produced. But we can finalize the price only after talking to government."

Alex Louis (2nd Year)

You won't believe that a cutting tool could be made of paper

Cut wood, acrylic, plastic? Check, check, check.

When Greek inventor John Iliadis wanted to create a powerful cutting tool, he chose, not steel or any other metal for the blade, but paper.

Paper? Paper?

Well, if you've ever had a cut on your finger from the sharp edge of a page of a book, you know how effective paper can be.

So, Iliadis, who has built micro-turbine engines, portable light-bulbs and other gadgets at home using nothing but household material and, as he says on his YouTube channel, "a lot of patience", decided to use paper.

The blade is actually nothing but a circular disc cut out of two sheets of ordinary paper pasted together. Fixed at the end of the rotating bit of a drill, it cuts through hard material with exceptional efficiency. Hard to believe, but true, as the video on the youtube demonstrates.

Gaurav Singh (3rd Year)

Can you think to travel anywhere on earth in an hour

TRAVEL Anywhere ON EARTH IN JUST AN HOUR, By the way it's beyond normal thinking but some people think at that level and they not just think But they make it reality too. We are talking about the founder, CEO, and lead designer of SpaceX & co-founder & CEO of Tesla, Mr. Elon Musk.

For almost a century we've been stuck with four modes of travel road, air, water, and rail. At present time Air transport is the fastest mode of transport; Commercial jets can reach a speed up to 955 kilometers per hour (539 mph), while piston-powered general aviation aircraft may reach up to 555 kilometers per hour (345 mph) or more.

Why not think bigger?

Elon Musk is obsessed with traveling between any two points on Earth in less than 30 minutes. Whether by hyper loop (above and below ground) or interplanetary rocket .The billionaire technologist is convinced that no trip between any two cities on the planet should no last longer than an episode of Tarak Mehta ka Ooltah Chashmah.

As we are talking about the BFR (BIG FALCON ROKET), It would transport passengers to any place on Earth in less than an hour, with most journeys taking half of that. After launching, the BFR would exit Earth's atmosphere while reaching a maximum speed of about 16,777 mph. Beyond the atmosphere, there's no weather or friction to cause turbulence, so the ride would be silky smooth. Upon return, the craft would use its two sea-level engines to set down gracefully on a landing pad. From a physics standpoint, what Musk is proposing is certainly achievable. We have intercontinental ballistic missiles capable of being fired into orbit and then detonating warheads at a target on Earth in about 30 minutes. So Why not humans?

But, The stresses of spaceflight, even during short trips, are also daunting to consider. Will people be willing to put their bodies through this kind of experience, just to save a few hours of their trips? 'The pilot may be subjected to confusion and nervousness too. This type of display, and the responsibilities of taking off and landing an interplanetary rocket full of men, women, and children, might be too much for normal pilots to handle. In fact, it could cause the pilot to have a total nervous breakdown

What about cost? SO Cost is another huge hurdle. But, Musk claimed that these rocket trips would be as inexpensive as commercial air travel. Because As SpaceX is adopting the BFR for all future missions, so building them at scale could lower their price enough to make Earth-to-Earth travel feasible.

These types of projects also have success more than failure. As looking on today's scenario which is going on the way of advancement, so In future we will have to

need this type of technologies, But it's suspense for all technology lover that how early and efficiently this will become true……

Arun Rawal (3rd year)

What does Chandrayaan-2 hope to accomplish?

If ISRO pulls it off, India will only be the fourth country to land on the moon – and the first to land on its south side.

ISRO/YouTube

India is preparing to land on the moon. In less than 24 hours, on Monday, July 22, at 2.43 pm, the country's second lunar mission called Chandrayaan-2 is scheduled to be launched into space.

The mission was to have been launched on July 15, but was called off 56 minutes before the scheduled time.

The Indian Space Research Organization will fire the rocket on Sriharikota Island, off the coast of Andhra Pradesh. Called the Geosynchronous Satellite Launch Vehicle Mark-III, it has been nicknamed Baahubali by the Telugu media, a reference to the blockbuster film featuring a bulked-up warrior, because it can carry a payload of up to four tones.

Apart from a lunar orbiter, the launcher will

also carry a lander called Vikram, named after the father of the Indian space program Dr Vikram Sarabhai. Inside Vikram will be a rover called Pragyan, which means wisdom in Sanskrit.

The various components of the moon mission. Images: ISRO

Chandrayaan-1, India's first mission to the moon, was launched in October 2008. It orbited around the moon and launched a Moon Impact Probe that conducted experiments along the way before it crashed into the moon. It was Chandrayaan-1 that first found traces of water vapour in the moon's atmosphere and on its surface.

What Chandrayaan-2 is attempting is a soft landing: one where a lander reaches the surface of the moon intact. If ISRO pulls it off, India will only be the fourth country to soft-land on the moon, after the United States, Russia and China. In April 2019, an Israeli spacecraft's attempt to land on the moon failed because of technical problems.

How will it work?

Once it is launched into space, GSLV Mk-III will take the lunar module into orbit around the earth. The module will release from the rocket and circle the earth multiple times, using the earth's gravitational force to gain momentum as it re-orients itself towards the moon.

Finally, it will spin out of its earth orbit and hurtle itself towards the moon, getting caught by the moon's gravitational pull, if all goes well. On-board thrusters will slow it down enough to stay in the moon's gravitational field. It will then circle the moon, before Vikram detaches from the orbiter.

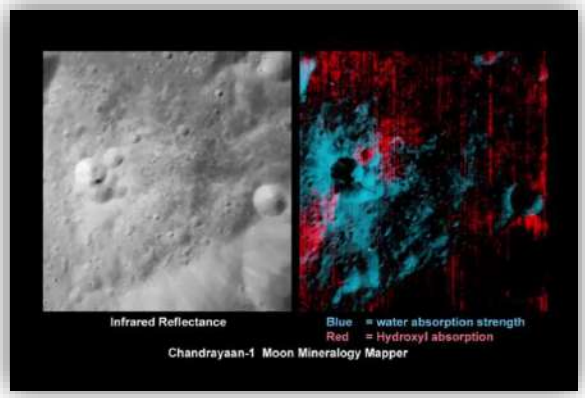
On the landing day, September 6, Vikram will take on a different trajectory, circling closer and closer to the moon, before using its onboard lasers to find a landing site.

Then, in 15 fraught minutes, Vikram will land on the moon.

The lander will have to slow down, braking against the moon's gravitational pull. This will require the firing of a propulsion engine, which in turn will cause lunar dust to fly at it. Lunar dust is sharp and jagged and its negative charge causes it to cling to surfaces, disrupting solar panels and sensors. The landing site could have landscape features that block communication, which means the control station could lose touch with the lander.

If Vikram lands successfully, it will then open, to release Pragyan, the moon rover. If the the door is damaged by the landing, it might not open, but if it does, Pragyan will emerge. It will take four hours to descend down the ramp that Vikram lowers, and to roll onto the moon.

Pragyan moves at the speed of 1 centimeter per second, and can travel up to half a kilometer away from Vikram. It will wander on the surface of the moon for one lunar day – the equivalent of 14 earth days – transmitting back all it learns to Vikram, and thence to the earth.



Chandrayaan-1 discovered evidence of water on the moon

Why the south of the moon?

A successful landing would make Chandrayaan-2 the first lunar probe on the south polar region of the moon. This area is of special interest because it receives very little sunlight. Some parts remain permanently in the shade, due to the tilt of the moon's axis. There are giant craters down there creating what are called cold traps: regions cold enough to freeze not just water but also a range of volatile compounds. The temperature of the lunar cold traps can go as low as minus 200 degrees Celsius – so cold that most gases freeze.

The compounds in those cold traps have been possibly frozen for as many as 3 billion years and could contain a record of the early Solar System. They could confirm the Giant Impact Hypothesis: that the moon was formed when, 4.4 billion years ago, an

object the size of a planet collided with the earth.

The region receives very little light, which makes the charging of solar panels difficult, meaning that the lander and rover could run out of power.

What does Chandrayaan-2 hope to accomplish?

Chandrayaan-1 found evidence of water molecules on the moon's surface. Pragyan will be carrying a range of spectrometers: apparatus that can calculate the composition of materials by passing radiation through them. It will also carry advanced synthetic aperture radar, which can test for the presence of water through several meters of rock. If the moon is proven to have sufficient reserves of water, it could one day sustain human life.

Chandrayaan-2 will be the first mission to land close to the south pole of the moon.

The orbiter will circle the moon for a year at a 100-km orbit. It carries eight payloads, from high-resolution cameras to a spectrometer to measure the moon's atmospheric composition.

Chandrayaan-2, with a cost of nearly Rs 1,000 crore, is the most complex mission ever undertaken by ISRO. It is fully indigenous. And it is India's first interplanetary mission to be steered by two women: project director M Vanitha and mission director Ritu Karidhal.

Ranjit singh (4th year)

Economic growth reducing groundwater faecal pollution in North India: IIT study

The data was collected from National Rural Drinking Water Program, Ministry of Drinking Water and Sanitation, and covered almost last three decades to delineate the long-term improvement trends of groundwater quality across India, as consequence of development.

Economic growth is reducing faecal pollution in groundwater in North India, which a key factor is causing water-borne

diseases in the densely populated Indo-Ganges-Brahmaputra river basin, a study by researchers at IIT Kharagpur has found. About 100,000 children in India die every year from waterborne enteric diseases like diarrhea, researchers said.

The study, published in the International Journal of Information Management, made first-time observations on significant reduction of faecal coliform pathogen concentration in the spatially variable groundwater from 2002 to 2017.

“Looking beyond the country globally, more than two billion people, mostly living in economically stressed areas of Africa and South Asia still do not have access to basic sanitation, and more than one billion still opt for open defecation,” said Professor Abhijit Mukherjee, from the Department of Geology and Geophysics at IIT Kharagpur in West Bengal.

“The resulting unsafe disposal of faecal waste to nearby drinking water sources poses an extremely serious environmental crisis and public health concern,” said Mukherjee, who led the research project.

The researchers studied data for the densely populated Indo-Ganges-Brahmaputra river basin, across 234 districts in Rajasthan, Haryana, Uttar Pradesh, Bihar, Jharkhand, Chhattisgarh, West Bengal, Assam and also Delhi and NCR.

The data was collected from National Rural Drinking Water Program, Ministry of Drinking Water and Sanitation, and covered almost last three decades to delineate the long-term improvement trends of groundwater quality across India, as consequence of development.

The study determined the economic development trends and correlations using nigh-time light data instead of gross domestic product (GDP) or other economic growth data..

“In most areas economic development, suggested by increasing satellite-based nightlight correlated to the reduction in faecal coliform concentration and alleviation of water quality,” said Duttagupta, first author of the research paper based on the study.

The other dataset used was high-resolution geographically spatial information of water-borne faecal pathogen concentration in groundwater from the period 2002-2017.

Numerical and statistical analyses were performed on datasets to understand the efficiency of development in alleviating the water quality and public health, and relationship with economic development. The study showed that the spatially variable groundwater faecal pathogen concentration from 2002-2017 has significantly decreased across the basin.

From 2002-2013, night-time light on the surface area as seen from satellites increased by 3.05 per cent per year and faecal coliform pollution decreased 1.39 per cent per year.

The research group observed significant decrease of groundwater faecal coliform concentration after 2014, in the acquired data.

"Nevertheless, in areas with inferior water quality, improper human practices outweigh economic development in affecting human health," he added.

It was observed that areas with lower literacy rate and very high population density suffer from poor groundwater quality because of faecal coliform pollution, irrespective of economic development.

The issue of overpopulation and slums is an intricate problem which is reflected on all life aspects in countries like India, researchers said. The study reflects through results that higher faecal coliform concentration in urban and peri-urban areas, suggesting economic progress may not be the only influencing factor on water quality alleviation, they said.

The researchers noted that social behavior and practices, use and disuse and beliefs are mostly related to lower literacy rate.

In turn, this result in lack of awareness and encourage malpractice on sanitation, eventually leading to increased faecal waste into drinking water sourced to groundwater, according to the study.

Pradyumn Paliwal (4th year)

Poetry

❖ दुआ मिली, मिला वो जिसकी उमीद थी
मिलकर भी, इतनी जल्दि बिछड़ा जिसकी उमीद न थी।
मैं तो सपने, देख रहा था उसके
सपनों में ही, धोखा दे दिया उसने।
उसकी यादों में, यूँ में रोया
रो रो कर, उसके ख्वाबों में खोया।
जाग गया, कुछ दिनों में
भुला दिया सपनो, को कुछ दिनों में।
समझ गया बुरा है, ऐसा सपना देखना
जिसमे साथ न हो, किसी अपने का।
Prajjawal Saxena (2nd year)

❖ न छोड़ा कोई दर, जहाँ ना माँगा हो उसे।
न जाने कितनी मनते माँगी, उसे पाने के लिये।
हर एक से बात करी, उसको मनाने के लिये।
हर वो कोशिश करी, उसे अपना दोस्त बनाने के लिये।
हुआ में ख़ुद से दूर, फ़िर भी संभालता रहा खुद को।
शायद रह गई कुछ कमी मुझमे ही, की हो गई वो मुझसे दूर।
कोशिश करता रहूंगा में, हार ना मानूँगा।
ऊपर वाले से वादा करा है, उसको पा कर रहूँगा।
हुई दुआ में ताक़त, तो वो होंगी मेरी।
नहीं तो इंतेज़ार करेंगी, ये जिंदगी मेरी।
Prajjawal Saxena (2nd year)

❖ दो वक्त् की रोटी के लिये,
तीन वक़्त काम किया।
हमारे सपने को पूरा करने के लिये,
खुद के अरमानों को छोड़ दिया।
फटी साड़ी पहनी पर हमें नया दिलाया,
फटे जूते पहने पर हमें किताबों का ज्ञान दिया।
दे दिया आज हमे सब कुछ जिसकी थी हमें जरूरत,
मेहनत कर खड़ा किया इतना बढ़ा आशियाना।
अब बस जरूरत है फर्ज अदा करने की,
उन्हें एक अच्छा बुढ़ापे देने की।
हर वो खुशी हर वो जग़ह घूमाना है,
उन्होंने इतना किया अब बस थोड़ा हमे करना है।
Prajjawal Saxena (2nd year)

❖ किसी भी लक्ष्य को जीतना, मुश्किल नही....
मुश्किल है तो बस, लक्ष्य की नींव रखना।
हर दिन आपको एक मौका देगा, नींव बनाकर कुछ करने का....
बस शुरुवात कर, कुछ अलग तो करना होगा।

सही वक़्त का इंतेजार करने की, जरूरत नही....
जरूरत है तो, वक़्त को जीतने की।
एक हार से क्यूँ डरता है....
क्यूँ बुजदिलों की तरह पीछे हटता है।
जो करना है, तुम्हें करना है....
फिर क्यूँ दूजों के पीछे, भागता है।
अभी तो शुरुवात है....
हार के बाद ही तो जीत है।
मिली है एक बार ये जिंदगी....
ना मिलेगी दोबारा, ये खुशी।

Prajjawal Saxena (2nd year)

❖ ये अधूरापन है कैसा, क्या है जो दरकार है,
इस कहानी को इसी कारण बहुत अफ़्कार है!!
क्या कहा कि जा रही हूँ, जाओ रोकूँगा नहीं,
हाँ, मगर तुमने ही शायद तब कहा था प्यार है!!
रंग, धमाके, ना हो हल्ला, ना ही इसमें खूँ बहे,
यार तुम बोलो इशक़ जैसा कोई त्यौहार है!!
ये लड़ाई है जो उनसे कुछ दिनों से चल रही,
इसकी तो हथियार आँखें ना कोई तलवार है!!
अब नहीं रहना किसी के भी नशेमन में हमें,
है किराये का मगर अपना भी अब घर-बार है!!
आ सिखा दूँ मैं तुझे नजरें मिलाने का हुनर,
इश्क की जन्नत का ये ही तो दर-ओ-दीवार है!!

Pradyumn Paliwal (3rd year)

❖ हमेशा चाहता था मैं, सुने समझे मुझे दुनिया,
मगर ठुकरा दिया उसने, कहा हमने जिसे दुनिया!!
कहा मैंने कभी, तो ये कहा, मुझको बचालो तुम,
सुना जो ध्यान से, तो बस यही मुझसे कहे दुनिया!!
मनु, आदम नहीं एडम, अरे जो भी रहा होगा,
कभी उसने मगर चाहा न होगा लड़ मरे दुनिया!!
मिटा के रख दिए नामोनिशाँ तुझसे वज़ीरों ने,
वगरना यूँ रहीं होंगी कई दुनिया परे दुनिया!!
कई आवाज़ आएँगी तुम्हें हिन्दू-मुसलमाँ की,
धधक कर जल रही होगी तुम्हारे सामने दुनिया!!
तुम्हारी मेज़ पर रक्खा गिलास-ए-जाम नइ है ये,
बड़े अहकाम देते हो कि जा छलकाइये दुनिया!!
सुनो तुमने अभी देखी महज़ ये एक दुनिया पर,
करोड़ों कहकशाँओं में करोड़ों बुलबुले दुनिया!!
जिसे मैं आज समझा हूँ, उसे तब ही समझ बैठे,

तभी साहिर हुए बेबस, कहा संभालिये
दुनिया!!
रहें सब पेड़ पंछी जानवर, बस आदमी ना हो,
दुआ ये आज करता हूँ कि तब फूले-फले
दुनिया!!
अगर तुम आज भी कह दो, कि हाँ तुम साथ
मेरे हो,
बनाऊँ मैं पहाड़ों पर तुम्हारे वास्ते दुनिया!!
Pradyumn Paliwal (3rd year)

- शब भर दिल में खट पट होती है।
  पहलू में बस करवट होती है।
  जब जब कोई आहट होती है।
  दिल में इक घबराहट होती है।
  तेरा रस्ता देखा करते है।
  मैं होता हूँ, चौखट होती है।
  बस इक सपना पूरा करने में,
  कितनी रातें चौपट होती है।
  तेरी है जो असली झंझट है।
  यूँ तो कितनी झंझट होती है।
  उससे मिलने की इच्छा मैं भी,
  ज़ाहिर नइ करता, बट होती है।
  Prashant Sharma (3rd year)

- हम सच में मर जाते है, हैरानी से,
  तुम कैसे हँस लेते हो आसानी से।
  ज़िक्र तुम्हारा कर बैठा मैं सानी से।
  पहला मिसरा जा उलझा वीरानी से।
  मुझ नादाँ से इश्क़ किया है तुमने भी।
  मर जाना अच्छा था, इस नादानी से।
  तन्हा कमरे में भी ऐसा लगता है।
  झाँक रही हो मानो रौशनदानी से।
  कुछ ख्वाब मिरे इन आँखों में डूब गए।
  अब तो मुझको डर लगता है पानी से।
  जौन पढ़ा है तुझको जबसे, सच बोलूँ।
  इश्क़ हुआ है मुझको लफ्ज़ ए जानी से।
  Prashant Sharma (3rd year)

ISHRAE CHAPTER

CHAPTER INSTALLATION
SESSION2018 – 19 @ 11/09/2018

The chapter was installed in IPS Academy, Institute of Engineering & Science in the month of September 2018 followed by a Technical talk given by the President of ISHRAE Indore chapter Mr. Jitendra Vyas Sir working as a Consultant, Indore on "Green Building & IOT Management System" to the student members registered as an ISHRAE Members with the oath ceremony of the CWC members.

Technical Talk by Mr. Jitendra Vyas Sir on "Green Building & IOT Management System"

❖ A-Quest Quiz Competition (Institute Level): 20 December 2018

❖ A-Quest Quiz Competition (Indore Chapter Level): 29 December 2018

❖ Industrial Visit at Cristal IT Park Indore@ 18 Jan 2019

❖ Industrial Visit at Kehems Technology Indore@ 19 Jan 2019

Technochill- 2019

❖ Expert Talk

❖ Poster Presentation

❖ Hands-on-Practice Session

❖ **Culfest**

SAE CHAPTER

BAJA SAE INDIA 2019

Team “Automaniacs” of IPS Academy, IES participated in BAJA SAE INDIA 2019 main event from 23rd to 27th January 2019 at NATRIP Pithampur (M.P.).

Departmental News & Updates

Students Achievements

(A) Special Award

S. No.	Name of Student	Department	Date	Achievement (Detail)
1	Pranshu Parouha & Yash Ghanshani	ME	05 Jan 2019	Second Runner Up in HVAC Quiz Organized by ISHRAE
2	Uma Shankar Dubey & Team	ME	(25-27) Sep 2018	STIG Award (Special Team in Go- Karting), Hyderabad

(B) Vice Chancellor Scholarship received from Rajiv Gandhi Technical University, Bhopal (M.P.)

1. Krishnakumar Singh (IIInd Year)
2. Vishudev Mishra (IInd Year)

I Academic Awards

S. No.	Branch	Student Name	Date dd/mm/yyyy	Organize Place	Name of Events	Awards
1	ME	Krishna Kumar Singh	21/02/2019	IPS Academy, IES	Swaranjali 2019	First
2		Shubham Choudhary				First
3		Yash Ghanshani				First
4		Prajjwal Saxena				First
5		Tushar Neelkanth				
6		Harshit Maheshwari				Second
7		Huzaifa Yakub Hussain				
8		Vishnu Dev Mishra				Second
9		Abhishek Tiwari				Second
10		Vaibhav K. Thakre				Second

(C)

(i) Paper Published in Journals International

S. No.	Deptt.	Name	Topic / Title of the Paper	Name of Journal (refereed)	Year of publish (with month)
1	ME	Ankit Pandey	Design of Portable Light Weighing Metal Cutting Machine	SSRN -Elsevier	May-2019
2		Kartik Ansune			
3		Mohit Gond			
4		Parth Chouhan			
5	ME	Sarthak Nagori	Comparative study between Vortex Tube Refrigeration System and regular Air Conditioner: Experiment	International Journal of Engineering and Techniques	May-2019
6		Shailendra Dubey			
7		Sheikh Mohd. Faizan			
8		Yogesh Kadam			
9	ME	Anuj Jain	Double Wishbone Suspension System of BAJA ATV	SSRN -Elsevier	May-2019
10		Abhishek Suryawansh			
11	ME	Ravi kawliya	Design and Fabrication Of Treadmill Bicycle	SSRN -Elsevier	May-2019
12		Ritesh Rathore			
13		Vishal Rathore			
14	ME	Pratik Maheshwari	Modelling of Flexible Drilling Machine	International Journal of Engineering and Techniques	May-2019
15		Roshan Patil			
16		Sanjeev Yadav			
17		Shubham Chaudhari			
18		Aniruddh Dongle			
19	ME	Deshmukh S.	Design and Durability Analysis of Ladder Chassis Frame	International Research Journal of Engineering and Technology (IRJET)	May-2019
20		Goswami S.			
21		Mathankar V.			
22		Shrivastava S.			
23	ME	Arif Khan	Design and Fabrication of Multi Nut Opener and Tightener	SSRN -Elsevier	May-2019
24		Shubham Jhunjhune			
25		Surendra Sanwer			
26		Yashpal Singh			
27	ME	Ayush Agrawal,	Mechanically Driven Floor Cleaning Machine	SSRN -Elsevier	May-2019
28		Bipendra Singh,			
29		Himanshu Turkar			
30		Kshitiz Sharma			

(D) Workshop Attended

S. No.	Deptt.	Name	Date dd/mm/yyyy	Details of Workshop	Topic
1	ME	First Year Students	20/08/2018-23/08/2018	Entrepreneurship Awareness Camp	Entrepreneurship

2 CULTURAL

List of Students Shining in Cultural Activities

S. No.	Name	Year	Branch	Event	Place	Date dd/mm/yyyy	Acquired Position
1	Nitin Vishwakarma Sangam Vishwakarma	III	ME	Poster Presentation	IPS Academy	09/02/2019	I
2	Suyas Jain Umashankar Dubey	III	ME	Poster Presentation	IPS Academy	09/02/2019	II
3	Rajaram & Group	III	ME	Dance Competition	IPS Academy	09/02/2019	II
4	Nikhil & Group	III	ME	Dance Competition	IPS Academy	09/02/2019	II
5	Praduman Paliwal & Group	III	ME	Skit Competition	IPS Academy	09/02/2019	I
6	Jhanvi Burman & Group	III	ME	Skit Competition	IPS Academy	09/02/2019	II
7	Mansi Pare Mihir Shrivastava	III	ME	Singing Competition	IPS Academy	09/02/2019	I
8	Vinod Malviya Arun	III	ME	Singing Competition	IPS Academy	09/02/2019	III

WINNER'S LIST

S. No.	Event Name	Name of Student	Position
1	Poetry	Prashant Sharma	**1st**
2	Poster & Slogan	Pranshu Purouha	**1st**
		Yash Ghanshani	**1st**

SPECIAL AWARDS

S. No.	Name	Year	Branch	Achievement
1	Mr. Shourya Nigam	IV	ME	Face of Crowd

3. SPORTS

WINNERS OF SPORTS

S. No.	Games	Position
1	Badminton	Runner Up
2	Chess	Runner Up

INDIVIDUAL SPORTS ACHIEVERS

S. No	Name	Name of Sport's	Department	National/ State level	Remark
1	Dhirendra Yadav	Swimming	ME	National Level	Representing RGPV at Inter-University Competitions in Swimming

4. Result Analysis

Merit Scholar & Gold Medal

LIST OF STUDENTS WHO IS GETTING FIRST/SECOND POSITION (ACADEMICS) (UG)

S. No	Name of Student	Branch	Year	Position	Percentage
1	Krishna Kumar Singh	ME	Fourth	First	8.88
2	Shubham Choudhary	ME	Third	First	8.52
3	Yash Ghanshani	ME	Second	First	8.93
4	Prajjwal Saxena	ME	First	First	8.67
5	Tushar Neelkanth				