किरIITH

the crowning glory

Issue - 1,
January, 2020

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IIT Hyderabad

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FROM DIRECTOR'S DESK

Dear Friends,

Wish you all a wonderful year ahead.

I am pleased to share the first issue of **किराIITH** - The Crowning Glory (an exclusive IITH e-bulletin) with you. The objective behind **किराIITH** is to remain connected with all those associated with IIT Hyderabad. IIT Hyderabad, since last two years is No. 1 ***(8th as per NIRF Ranking among engineering institutes in India)*** among all 2nd & 3rd Generation IITs in India and is all geared-up to grow further.

IIT Hyderabad had very prolific 2019 with a lot of significant research outcomes such as making Chemotherapy easy, creating a bot which talks like humans, finding Antarctic Fungi that has potential to cure Leukemia, device for early diagnosis of Heart Attack, prediction model for performance of Indian Roads, creating bio-bricks from agricultural waste, essential oil-based drug delivery system to treat fungal infections and many others studies in the different field of engineering.

Students of IIT Hyderabad has also glaringly added to the brand of IIT Hyderabad through their notable contribution in research, various awards for their splendid achievements and representation of IIT Hyderabad at various distinguished platforms across the globe.

We will always be thankful to our technology partners who have confidently invested in us either by funds or knowledge. This trust has given IIT Hyderabad an edge over other technical institution in the country. In last one year, we have signed more than a dozen MoUs with different Organizations, Institutions of high repute and Government Bodies.

I also take this opportunity to thank the supporting staff who have silently supported all the great work at IIT Hyderabad in last one decade and continue to deliver their best for the institute.

IIT Hyderabad aspires to quadruple its annual research funding by 2024 so that many innovations can be brought-out for the welfare of the mankind.

Looking forward to the support of all of you in seamlessly taking IIT Hyderabad towards its Vision 2024.

Best Wishes,

Professor B S Murty

Director, IIT Hyderabad

EDITORIAL NOTE

Dear Readers,

Welcome to first edition of **किराIITH** - The Crowning Glory. **किरीट** (Taken from Hindi & Telugu which means "Crown") is the winning suggestion of Mr. Vineeth George, Doctoral Research Scholar at Department of Liberal Arts which has been creatively altered by Mrs. Mitalee Agrawal (Two Letters in Hindi and rest in English to depict IITH Brand. As the name suggest, the aim of **किराIITH** is to put forward the crowning research, achievements & highlights of IIT Hyderabad Fraternity to the outside world.

This edition of **किराIITH** has got some interesting read-outs, IITH's BoK, various talks and beautiful glimpses of 2019 @IIT Hyderabad.

Prof. Deepak John Mathew, HoD-DoD
Design & Layout | Faculty Representative - 1

Mr. Bharadwaj Peela
Content Coordinator, Student Gymkhana

Prof. C. Krishna Mohan
Dean - Corporate & Public Relations

Ms. Roshni Pande
Media & PR Secretary, Student Gymkhana

Dr. K. Siva Kumar
Dean - IAR | Faculty Representative - 2

Mrs. Mitalee Agrawal
Public Relations Officer - PRO | Editor-in-Chief

My Research Diary

Affordable Housing Technology by *Dr. MK Madhavan's* research group

Our research group at IIT Hyderabad focuses on the innovative use of structural steel in a sustainable manner to solve the global infrastructure need. In particular, my team is working on development of affordable housing technology using light gage steel structures, geometric imperfection studies in cold-formed steel, structural design of cold-formed steel wall panels, CFRP retrofitting of steel structures, connections in cold-formed steel sections, behavior of high strength steel sections, composite (steel-concrete) construction, cyclone resistant structures, analysis of parallel flange beam structural steel section.

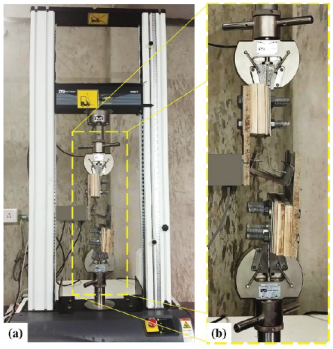


Figure Caption: **Newly developed test setup to determine the stiffness of the sheathing boards in the wall panel**

My team is mostly focused on real life problems encountered by the construction industries, and the investigations are primarily experimental based. Most of our recommendations, suggestions are adopted in the industry, specifically the wall panel design and retrofitting of steel structures. Research publications from my group were published in the top international journals such as ASCE Journal of Structural Engineering, Journal of Composites for construction, thin walled structures and Journal of Constructional Steel Research and the outcomes were well acknowledged by the international codal committees and research community.

Our primary goal is to develop and derive a design guidelines in form of the design codes (i.e. IS 800 and IS 801) for the construction of steel structures, and enable the sustainability in the infrastructure development.

Dr. Mahendra Kumar Madhavan,
Structural Steel Research Group,
Associate Professor, Department of Civil Engineering, IIT Hyderabad

The Structural Steel Research Group of the department of Civil Engineering is also organizing the Indian Structural Steel Conference (ISSC) between March 25-27, 2020 in association with ASCE India Section and Springer Publications. It will be of interest to steel and aluminum structure designers and manufacturers, trade associations, design engineers, steel fabricators, architects, owners or developers of steel and aluminum structures, researchers, academics and post-graduate students. Please see the conference website for more information: https://www.issc2020.com/

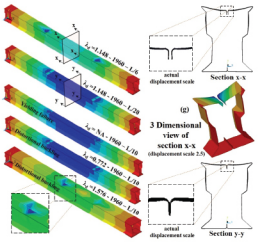


Figure Caption: **Development of Finite Element Model for Cold-formed Steel Built-up Beams**

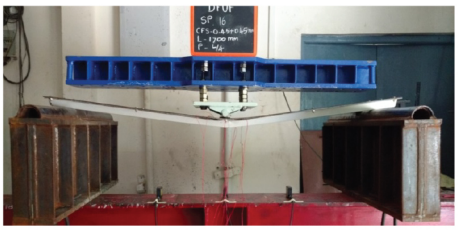


Figure Caption: **Development of Light weight flooring system**

Go to Know...

Biodegradable Sanitary Pads: A Reality Check

Dr. Chandra Shekhar Sharma,
Associate Professor, Creative & Advanced Research Based On Nanomaterials (CARBON) Laboratory, Department of Chemical Engineering, IIT Hyderabad

Approximately 350 million is the number of menstruating women in India at present. Given the increased awareness due to several factors and Government's efforts on menstrual hygiene by providing affordable sanitary napkins in school and rural areas, more number of women have now access to these products, although there is still a lot to be done. This has resulted in several new products in the market in last 3-4 years. Further focus on environment, and a mad-rush to ban plastic, most of these new brands claim their sanitary napkin product as 'bio-degradable' and 'eco-friendly'.

Figure Caption: **Different layers of a typical sanitary pad (Source: www.scienceandsamosa.com)**

A sanitary pad does not contain only bleached wood pulp or cotton which is now being replaced with natural fibers like more commonly used banana fibers in these new products however there are other plastic laminates and fabric layers to offer the feel of dryness and making these pads leak-proof. These include superabsorbent polymers (SAP) paper, release paper, breathable polyurethane film and polyester film which are essentially plastics and non-biodegradable. Then, we need hot melt glue as an adhesive which is also non-biodegradable. Therefore, as a consumer, we must be aware about such false claims of 100% biodegradable sanitary napkins. There is no, I repeat and I mean it, absolutely no 100% biodegradable sanitary pads in the market as on date. Even the idea of using bio-SAPs and bio-degradable adhesives in these products while without compromising the performance is still in its infancy. Even the claims of composability by some of these new brands in the name of justifying higher prices, saving environment and innovative is unrealistic until there is a separate segregation and collection chain of used products.

Ms. Kanaka Himabindu,
Ph.D. Student, Department of Liberal Arts
IIT Hyderabad

Potable and Palatable: Perspectives of Water

Anthropology holds up a great mirror to man and lets him look at himself in his infinite variety (Clyde Kluckhohn). The project is a part of the centre for sustainable development at IITH, supported by MHRD. The civil engineering faculty Dr K.V.L.Subramanyam head it and Dr Haripriya Narasimhan to give an anthropological perspective in it. Ms Kanaka Himabindu Pottumuthu is the doctoral student, pursuing research in it. Under sustainability and smart cities umbrella, the topic was taken forward with an assured ethnographic background of the researchers. The pilot study involving multi-disciplinary experts in Hyderabad gave a panoramic social science perspective. Furthered the research from 2016 by collecting ethnographic narratives. It gave an understanding that domestic water management amongst middle-class residents was crucial and that people have ways to combat the necessity in the light of shortages. The contemporary new Indian middle-class is always anxious about environmental 'purity' and 'pollution', about air, water, or food. This study highlights the concerns about people's distrust of the quality and taste of state-supplied water. Apart from the citizen's discourse, the researchers have also explored sustainable water management practices of heritage sites in Hyderabad. It is essential to understand heritage sites because things were made accessible by understanding geographical space, and with merely available technology, they created incredible structures. Also, an anthropological understanding of such spaces explained the cultural meanings attached to them. Also, the study of the newly declared smart city of Kakinada has included in this research. To bring out contrast on sustainability and smartness, as a part of the development discourse. This contrast mix of residents understanding about the development with Kakinada Smart City Corporation perspective explained a lot of interesting facts. Finally, this work intends to contribute to the policy implications of sustainable and smart water management in urban space. Hence, addressing the more significant smart city development issues with an ethnographic data would enlighten the policy developers.

My Dream Destination

Mr. Piyush Bharadwaj,
M.Tech - Machine Learning
Department of Computer Science
& Engineering, IIT Hyderabad

What's the best thing that could happen to an engineering graduate from a third-tier college? Admission to the prestigious IITs. It's like a second chance for students like us who failed to get into IIT for their bachelor degree. And as Pete Rose rightly said, "If somebody is gracious enough to give me a second chance, I won't need a third." and hence I buckled up to tackle the challenges & prove my mettle once again in engineering. Every engineering aspirant dreams of going to the IITs, and here I was, going to live the dream of a million students. And that dream became reality as I gazed upon the iconic hostels of IIT Hyderabad as soon as I got down from the bus. "I made it!", I thought to myself; little did I know, the adventure had just begun.

Going to the lecture hall for the first time is exciting, as one finally gets to see those NPTEL lectures in real-time which we only streamed on YouTube to pass our undergraduate exams. Thanks to the fractal academic course structure at IITH, everyone is free to choose any subject as elective along with a few mandatory ones. The confusion begins when you attend your first lecture. And then you see yourself surrounded with Btech & PhDs, some are keenly writing notes, while others just listening to the professor and raising doubts & that too without even lifting a pen, and the third kind which you don't see in class because they skipped the classes. "How would I keep up with them?", I murmured when I saw my fellow batch mate smiling at me because he was thinking the same thing. Time passes and we adapt to the academic environment. One of the biggest myths was thinking that all the IITians must be nerds. And boy was I wrong! After the classes used to end for the day, students usually dispersed in every direction. There is a rush to reach the sports ground and take the first turn. Some pick up their musical instruments and the jamming session begins. Some just prefer to take a calm walk around the campus, enjoying the beautiful sunset. There is a diverse group of students, and you just feel lucky to be here. Rounding back to academics, the faculty here is fantastic, young & dynamic in nature.

Professors don't expect you to be an expert on the basic when you enroll in the course. Yet it doesn't stop them from taking up the most complex topics and explaining them with grace. Yes, the pressure is there for MTechs as compared to other streams, but when you see your 20 something other batch mates suffering in silence you just tidy up, knock up your collars and get to studying, and before you know it you well accustomed to the schedule. Although that doesn't mean that we don't have that pre-exam night hustle, who are we to break the age-old tradition. All we have to do is make sure is the topper finishes his part a day before and is open to our doubts/questions. That was all about course-work. What separates us from the undergrads, and IITs from IIITs is the heavy amount of research we are exposed to. Our curriculum is designed so as to give equal importance to our master's thesis. And hence we learn the art of managing time while juggling our thesis work and placement preparation. Some of us are already hardcore coders, while some are exposed to competitive coding for the first time. But as I said again, as long as you've 20 something batch mates grinding hours in and out with you, the pain actually reveals itself to be a pleasure in hindsight.

There exists one of the most underrated aspects that is almost overlooked in every guy's mention. No, it's not the faculty, quality of education and especially how amazing Machine Learning culture is, not the radiant hostels freezing us in hot summer's day. It's a friendship. You get a batch of friends where we span entire India, sometimes it gets quite difficult to find two guys from the same state. And yet this bunch of misfits, even whose native language might differ, fits it stronger together than even a bunch of Legos. And yes, we develop crushes too. What better place is there where you can find beauty and brains coexisting in a human form! We work hard, but we party harder. We go out, eat at dhabas around the campus. And this bond is not just limited to M.Techs. We're in good sync with bachelors and PhDs as well. We compete with them in classes, who's to stop us from competing with them in sports or just about anything, we do everything hand in hand. You meet a wide variety of people, from far places, yet I bet there's going to be a lot of manly tears when it's our last day at this campus. Sure some will stay in touch, there'll be promises of meeting once every year. Don't know how'd that happen, but I'm sure we'll leave with a bucket load of memories, that'll be cherished as one of the absolute fantastic phases of our lives, MTech@IITH.

Motivation to Move

Emotional First Aid

Mr. Divansh Singla,
B.Tech Student,
President - Student Gymkhana
Department of Civil Engineering,
IIT Hyderabad

Motivation to Move

I am Divansh Singla, a 3rd year Undergraduate pursuing Civil Engineering. In the Academic year 2019-2020, I took up the post of the President of Student Gymkhana, student executive body of IIT Hyderabad. I have been exposed to dealing with people having different ideas and methodologies and I learnt how challenging it can be to keep all of them satisfied. The leadership skills and the enthusiasm I get from going out of my way to talk to people and listen to their problems has been a lovely experience. I've observed that It is not very so easy to make some decisions without having to face unexpected consequences. I had a wonderful opportunity to interact with lot of many professors and know them not only as an academician but also as a person.

I look upon this as an amazing learning experience and I am keen to motivate my juniors and peers as well to become representatives for public opinion and know how wonderful it is to closely observe and solve the problems people face in our institution. I would like to give a piece of advice to my fellow students - So far, one thing that my journey here at IITH has taught me is to interact and make as many friends as one can. When one is so far from home and family, friends are the ones that make your journey better. I had my troubles adjusting to new faces and people in my first year and as time passed, I got associated with people more than I had imagined. Now that I look back, I hardly have any memories without my friends being included and that's the most significant part of me in my college life.

Mr. Phani Bhushan
Psychological Counsellor,
IIT Hyderabad

Emotional First Aid

It's my utmost pleasure to work with IIT-H to grow and give back what I learnt by making a beautiful place to live in. It's a high time we practice mental health hygiene just as we do dental and physical hygiene. Ask a ten year old what you should do if you get a cut on your knee and the child would immediately recommend cleaning it and bandaging it. We teach our children how to take care of their bodies from a very young age and they usually learn such lessons well.

But ask an adult what you should do to ease the sharp pain of rejection, the devastating ache of loneliness, or the bitter disappointment of failure, or low self-esteem or loss and trauma and the person would know little about how to treat these common psychological injuries. Some might confidently suggest the best remedy is to talk about our feelings with friends or family members. But while discussing our feelings might offer relief in some situations, it can actually be damaging in others. The reason we take little to no purposeful action to treat the psychological wounds we sustain in daily life is because we lack the tools with which to manage such experiences. So, Here I am to help you all out with the emotional equivalents of bandages, antibacterial ointments, icepacks and fever suppressants for all the emotional wounds.

I want to mention an easy scientifically proven first aid for Anxiety or Panic attack - Look around you. Find 5 things you can see, 4 things you can touch, 3 things you can hear, 2 things you can smell, and 1 thing you can taste. This is called Grounding Technique. It can help when you feel like you have lost all control of your surroundings.

Can you imagine what the world would be like if everyone was psychologically healthier? If there were less loneliness and less depression? If people knew how to overcome failure? If they were happier and more fulfilled? We can, because that's the world we want to live in. So, Let's start practicing emotional hygiene.

IIT-H develops antifungal system

STATE BUREAU
Sangareddy

Dr Mudrika Khandelwal (R), Associate Professor, IIT Hyderabad, with her PhD student Shivakalyani Adepu at a lab in IIT-H.

Indian Institute of Technology Hyderabad (IIT-H) researchers have developed essential oil-based drug delivery systems to treat fungal infections without running the risk of inducing drug resistance. This medication can even counter fungi that have developed resistance to conventional antifungal drugs.

Microorganisms such as bacteria and fungi have a remarkable capacity to evolve resistance to antimicrobial agents used to destroy them. The research was led by Dr Mudrika Khandelwal, Associate Professor, Department of Materials Science and Metallurgical Engineering, IIT-H, and supported with funds by the Science and Engineering Research Board, Department of Science and Technology (DST), Government of India, and Corporate Social Responsibility (CSR) Grants from the American multinational conglomerate AT&T.

Antifungal hygiene products

The Research Paper, co-authored with her Ph D student Shivakalyani Adepu, was published in the international peer-reviewed journal Materialia. With the results of this work, the researchers are developing prototype antifungal hygiene products with the financial support from the Biotechnology Industry Research Assistance Council (BIRAC), set up by the Department of Biotechnology (DBT), Government of India, as an Interface Agency to strengthen and empower emerging Biotech enterprises.

Highlighting the need for developing alternate, non-resistance inducing treatment options for fungal diseases, Dr Mudrika Khandelwal said, "Given the prevalence of fungal infections such as vaginal infections, diaper rash, athlete's foot, and nail fungus, caused by the Candida family of fungi, drug resistance can become life-threatening."

Decoding protein that repairs damaged DNA

IIT-H research was funded by the Science and Engineering Research Board

SPECIAL CORRESPONDENT
HYDERABAD

The IIT Hyderabad research team. • MOHD ARIF

The Indian Institute of Technology - Hyderabad (IIT-H) researchers have unravelled the working of a protein that repairs damaged DNA.

Nature has evolved techniques to not only protect DNA, but also repair damaged DNA so that a catastrophic damage can be averted.

In humans, one such repair mechanism involves activation of a special class of proteins called "DNA repair proteins".

With increasing awareness of the impact of DNA damage on almost all diseases and maladies, there is a worldwide effort to understand how these repair proteins work, both as an academic exercise and as the foundation for therapeutic interventions.

The research team was headed by associate professor, department of biotechnology, Anindya Roy. The research was funded by Science and Engineering Research Board, department of science and technology, Government of India.

The results of the study, conducted in collaboration with professor of the department of biosciences and bioengineering of IIT- Guwahati, Arun Goyal, has been published recently in the journal Nucleic Acid Research. The paper has been co-authored by Dr. Anindya Roy, Dr. Arun Goyal and research scholars namely Monisha Mohan, Deepa Akula and Arun Dhillon.

What makes matter a living being, be it a bacterium or man, is a DNA. DNA is the blueprint of life form and encodes directions that the life form must take in order to become a bacterium, rose, lion or man.

It is thus essential for the survival of every cell and is usually kept well-protected within the nucleus of cells, and in some non-nuclear parts like the mitochondria.

Any damage to DNA can result in outcomes that can range from mild changes that cannot be perceived like a sudden appearance of a harmless mole to catastrophic diseases like cancer. The retention of DNA integrity is therefore essential for proper function and survival of all organisms.

Protection of DNA is daunting because of the possibility of damage by external sources and the intrinsic instability of DNA itself.

"Our laboratory at IIT-Hyderabad seeks to understand the working of DNA damage repair proteins. Certain types of chemicals produced naturally in the body can cause damages in DNA and, if not fixed fast, may trigger cell death", Dr. Anindya Roy said.

Ms. Monisha Mohan discovered the mechanism by which these DNA repair proteins assemble when DNA is under threat. They studied the action of one specific protein called alkB homolog 3, or ALKBH3. It is known that ALKBH3 repairs alkylated DNA containing 1-methyladenosine and 3-methylcytosine through oxidative demethylation, but the mechanism has hitherto remained unclear.

Dr. Anindya Roy and the research team have unravelled the mechanism by which ALKBH3 brings about demethylation.

"We have found that ALKBH3 has a direct protein-protein interaction with another protein called RAD51C and this interaction stimulates ALKBH3-mediated repair of methyl-adduct located within 3'- tailed DNA", adds Dr. Anindya Roy on the technical aspects of their discovery.

The team is fascinated by the universality of the mechanism - it is just as applicable to the bacterium as it is to human beings.

"The knowledge gained from our studies might, in the long term, be beneficial from a cancer therapeutic perspective", hopes Dr. Anindya Roy, as his team proceeds with work on understanding how DNA repair works.

Startups, healthcare experts stress innovation

STATE BUREAU
Sangareddy

Participants at the CfHE 'Med Tech' Symposium at IIT-Hyderabad.

The Indian Institute of Technology, Hyderabad (IIT-H) hosted a symposium to bring together key leaders in the field of medical and healthcare technologies to discuss the challenges and developments in the medical devices startup ecosystem.

At the 'Med Tech' symposium, organised by IIT-H's Center for Healthcare Entrepreneurship (CfHE), panel discussions were held on topics such as Early Stage Funding, Medical Device Regulatory Aspects and Industry Perspective, which will help startups in the domain. The event focused on early startups and budding entrepreneurs, and was seen as a platform to connect with veterans and experts in the field of medical technologies. Addressing the event, Prof BS Murty, Director, IIT-H, said, "A need was felt to usher in innovation and incubation culture in academic institutions. IIT-H has always been progressive to address such needs. With strong research in Biomedical Engineering and a lot of other members of faculty from other departments engaged in interdisciplinary research in allied areas, it was only appropriate to identify healthcare as the theme for this endeavour". The Foundation for CfHE is sponsored by two IIT-Bombay alumni and is focused on making universal healthcare a reality.

Its objective is to catalyse healthcare innovation to bring about affordable solutions to address the healthcare needs of India. It also hopes to foster entrepreneurs to deliver a pipeline of cost-efficient solutions, which are increasingly 'commercialised'. Prof UB Desai, Head of Operations, CfHE, said, "It aimed at connecting IIT-H-incubated startups with investors and venture capitalists".

IIT-H CfHE Fellow launches nation's first 'Vaccination on Wheels' clinic

INNOVATIVE

EXPRESS NEWS SERVICE
@ Hyderabad

Jignesh Patel explains to the visitors about the 'Vaccination on Wheels' clinic

INDIAN Institute of Technology Hyderabad (IIT-H) Centre for Healthcare Entrepreneurship (CfHE) Fellow Jignesh Patel has launched a 'Vaccination on Wheels Clinic' in Pune recently, in collaboration with the Bill and Melinda Gates Foundation.

According to a press release from IIT-H, the one-year residential healthcare entrepreneurship programme at CfHE, IIT Hyderabad, helped Jignesh Patel to understand the gaps in the vaccine delivery model from close quarters and identify various issues faced by diverse stakeholders, primarily from infants/caregivers/parents in getting vaccinated.

The clinic will go to schools, colleges and corporates to conduct vaccination camps at their doorsteps, with the aim of providing low-cost vaccination service to the low-income groups in society.

Professor Renu John, Co-Head, CfHE, and Head of the Department of Biomedical Engineering, IIT Hyderabad, said, "This is a unique programme that works hand-in-hand with the government to cover the last mile in delivering vaccines to people of all strata of the society."

"We have taken this mission to support the society in getting children fully immunised as per the WHO and IAP standards for children who are taking vaccination from government centres," said Patel.

OPPO ties with IIT-Hyderabad to boost AI

PNS ■ HYDERABAD

Chinese smartphone maker OPPO on Monday said it has entered into a partnership with Indian Institute of Technology-Hyderabad (IIT Hyderabad) to promote collaborative research on advanced and emerging technologies. The collaboration is aimed at promoting joint research and development for multiple projects over a period of two years for the development of new technologies in areas specific to camera and image processing, battery, networks (5G), system performance and Artificial Intelligence (AI), among other areas.

The partnership is in line with OPPO's effort to build localised solutions for the Indian market. "We are happy to collaborate with OPPO India through the expertise of our researchers, to further support and strengthen their R&D efforts in bringing technological breakthroughs for the Indian market," Sumohana S. Channappayya, Dean - Research and Development, IIT Hyderabad, said in a statement.

"This collaboration with OPPO will help in the development of indigenous solutions to cater to the dynamic needs of the Indian consumers," Channappayya added. A memorandum of understanding (MoU) was signed between IIT Hyderabad and OPPO to facilitate exchange of ideas and carry out research.

"Our collaboration with IIT Hyderabad is in line with our vision to enhance R&D and innovation capabilities at OPPO India as we continue our endeavour to build localized solutions for the Indian market," said Tasleem Arif, Vice President and Head R&D, OPPO India. "This collaboration aims to pave the way to carry out quality research and promote the rapid integration of cutting-edge technology, particularly in the areas of 5G and AI," Arif said.

Socio-economic status decides on migration in Bihar, says IIT-H study

ENS @ Hyderabad

A study on migration of people from rural areas of Bihar to other states for work by an IIT Hyderabad researcher has revealed that social hierarchy in the State plays an important role in the migration destination and the kind of work a migrant undertakes.

The researcher reports that majority of the migrants, 78 per cent of the study sample, moved to urban areas of the country. However, those who moved to urban areas were mostly from the upper echelons of the society, whereas, those from lower socio-economic classes moved to rural areas.

The researcher found that migrant workers who are higher placed in the socio-economic ladder, and more educated tend to step out of the village without having worked at all in the local rural economy. Whereas, those placed at the bottom of the ladder predominantly undertake manual work and when they migrate, are more likely to move to other rural areas.

Titled 'Poverty, Migration and Development in Rural Bihar,' the study was undertaken by Dr Amrita Datta, assistant professor, development studies, department of liberal Arts, IIT-H. This work has been done in collaboration with Institute for Human Development, New Delhi.

IIT-H adds light & heat to meds to kill cancer cells in novel way

Syed.Akbar@timesgroup.com

EASY ON CELLS

➤ Researchers found photothermal therapy and chemotherapy helped kill malignant cells

➤ In photothermal therapy material that converts light to heat is directed to the tumour

➤ A team of IIT-H, IIT-Bombay and Bose Institute, Kolkata, developed the new method

Hyderabad: Researchers from the Indian Institute of Technology, Hyderabad (IIT-H), have found that adding light and heat to anti-cancer chemicals helps in treating cancers more efficiently. At present, cancer patients are treated with chemotherapy in which powerful chemicals are used to kill cancer cells.

The IIT team found that adding light and heat, or photothermal therapy to chemotherapy helps in killing malignant cells, providing relief to patients. Called a combination therapy, the IIT-H cancer treatment model involves photo (light) and heat (thermal), apart from the usual chemicals (chemotherapy).

This gives much-needed synergetic impact to anti-cancer treatment currently followed worldwide. Moreover, the chemical used in chemotherapy by the IIT team is derived from natural sources, and thus, has little negative impact.

The IIT-H team collaborated with counterparts at IIT Bombay and Bose Institute, Kolkata, in developing the new treatment regimen. During research, the team found that a synergetic combination of photothermal therapy and chemotherapy had shown efficacy in fighting cancer cells. The result of the research was published in the recent issue of the science journal, 'Nanoscale'.

▶Continued on P3

IIT-H set to help TS govt carry out research on AI

DC CORRESPONDENT
HYDERABAD, JAN. 2

The Indian Institute of Technology Hyderabad (IIT-H) is going to collaborate with the Government of Telangana to carry out research in Artificial Intelligence. The Institute is partnering with the Information Technology, Electronics and Communication Department, for building, and identifying quality datasets, along with third parties such as Industry.

The Memorandum of Understanding (MoU) was signed by Prof B S Murty, director, IIT Hyderabad, and Jayesh Ranjan, principal secretary to Government of Telangana, during an event held on January 2, 2020 as part of '2020: Declaring Telangana's Year of AI' initiative.

They will also work on Education and Training to prepare and deliver content and curriculum on AI courses, which are to be delivered to college students along with industry participants.

Prof Murty, director of IIT Hyderabad, said, "IIT Hyderabad is a pioneer in the field of Artificial Intelligence. IIT Hyderabad is the first institute in the country to launch a BTech program in AI. With a strong base of close to 25 faculty in the Department of AI, IIT Hyderabad is looking forward to such opportunities to come up with many more innovations and research achievements in the field."

IIT-H analysis moots geothermal energy

SPECIAL CORRESPONDENT
HYDERABAD

Professor Chandrasekharam and professor Pathegama. • MOHD ARIF

An extensive analysis by the Indian Institute of Technology, Hyderabad (IIT-H) and Monash University, Australia, has led researchers to suggest that geothermal energy (using earth's heat to generate power) is better than photovoltaic energy, in terms of carbon dioxide emissions.

The researchers also found that a combination of renewable energy technology must be adopted in this era of dwindling fossil fuel reserves and increasing greenhouse gas emissions.

This analysis was undertaken by professor D. Chandrasekharam of the department of Civil Engineering, IIT-H, and professor G. Ranjith Pathegama of the department of Civil Engineering, Monash University, Melbourne.

The research paper was published recently in the journal "Geomechanics and Geophysics for Geo-Energy and Geo-Resources."

"While solar power does have benefits over conventional energy sources, is the hype surrounding its apparent 'greenness' justified? Solar power is far from the zero-emission energy source that it is claimed to be," said Chandrasekharam. Their study involved life-cycle assessment of renewable energy sources.

Around 10 tonnes of quartz are needed to manufacture solar cells that can generate one megawatt of electricity from the Sun. One MW of electricity can support about 20,000 people annually.

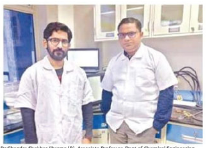
The total CO2 emissions during the life-cycle of a solar pv cell are about 3,312 million kg. This is far higher than geothermal energy source, which emits about 450 g/kWh generated, reports the paper.

"Unlike other renewables, geothermal energy can supply base-load electricity and the waste after its life-cycle, unlike solar PV, is negligible. The best way to go forward is to choose a combination of technologies that can minimise harm to the environment," write the researchers.

The researchers analysed the life-cycle assessment solar cell technology in terms of the environmental impacts during construction, operation and decommissioning stages.

IIT-H, IIT-Jodhpur develop materials to detect hydrogen gas leaks

- **Despite the enormous promise of 'hydrogen economy,' there are problems such as leaks, which are hard to detect, which is dangerous as hydrogen is inflammable**
- **This collaborative research attempts to solve this problem**



Dr Chandra Shekhar Sharma (R), Associate Professor, Dept of Chemical Engineering, IIT Hyderabad and Akash Nathani, Research Scholar, IIT-H

Hyderabad: Indian Institute of Technology Hyderabad and Indian Institute of Technology Jodhpur have developed materials that can detect Hydrogen Gas Leaks with high sensitivity. The research team has synthesised a semiconductor material that can be used as a sensitive detector of hydrogen gas.

This work by the IIT Hyderabad and IIT Jodhpur team YAS) at IIT Hyderabad in December 2018. During this meeting, Dr. Chandra Shekhar Sharma, Associate Professor, Creative and Advanced Research Based On Nanomaterials (CARBON) Laboratory, Department of Chemical Engineering, IIT Hyderabad, and his research team held discussions on collaborations with Dr. Mahesh Kumar, Associate Professor, Department jendra Singh Bhati, Mr. Akash Nathani and Mr. Adarsh Nigam.

Speaking about the importance of this research, Dr. Chandra Shekhar Sharma said, "In the past few decades, the importance of hydrogen has grown tremendously because of its promise as a primary energy source with the potential to become a panacea for clean energy generation."

Despite the enormous prom- derabad and IIT Jodhpur attempts to solve.

Highlighting the need for this research, Dr. Mahesh Kumar, Associate Professor, Department of Electrical Engineering, IIT Jodhpur, said, "The explosive range (4–75%) and low ignition energy of hydrogen make leaks very dangerous. Human beings can't sense hydrogen because it is colorless and odorless, which makes it essential to develop tools and sensors to detect hydrogen."

Many kinds of hydrogen sensors are being studied, including optical, electrochemical and electrical sensors. Electrical sensors, in particular, resistive sensors, are the closest to practicality due to their low cost, simple design and possibility of good sensitivity. The sensors to hydrogen gas must be highly sensitive and selective to the gas.

Explaining how resistive sensors work, Dr. Mahesh Kumar said, "Certain materials undergo a change in their electrical resistance when they come in contact with specific gases. For example, metal oxide semiconductors such as zinc oxide show changes which the particle sizes are a hundred thousand times smaller than the width of a single human hair, have good hydrogen sensing properties, but the research team has improved the sensitivity of this material even further.

The researchers have loaded the zinc oxide nanoparticles onto nanofibres of carbon and have shown that this results in a sensing response of nearly 74% compared to 44.5% in pure ZnO nanoparticles. Nanofibres are extremely thin fibres that are bundled to look like cotton candy.

The team attributes this improvement in performance to the easy diffusion of hydrogen gas through the nanopores of the cotton-candy-like carbon nanofibres, thus bringing them into intimate contact with the ZnO nanoparticles that are deposited on the nanofibres. "The presence of oxygen on the surface of the carbon nanofibres also contributes to the improvement in sensitivity", added Dr. Mahesh Kumar.

The team spun the nanofibres by a process called electrospinning, in which a polymer solution

IIT-H develops a sensor to detect biomolecules

ENS @Hyderabad

RESEARCHERS from the Indian Institute of Technology (IIT) Hyderabad have developed a sensor to detect biomolecules such as Bovine Serum Albumin (BSA), a protein of high interest in the field of research.

This sensor, made from environmentally friendly, cheap and biocompatible material can be used to develop a sensitive, rapid and an inexpensive portable device for detecting protein, making diagnosis cheaper and faster.

A research paper on the study co-authored by Suryanarayana Jammalamadaka of the physics department at IIT Hyderabad was published recently in the journal Scientific Reports, for which they have also filed a patent. According to a media release by IIT Hyderabad, Human Serum Albumin (HSA) has been of great interest as the assessment of its levels in human blood and urine is important for diagnosis of a range of conditions such as malnutrition, kidney diseases and liver abnormalities.

Due to structural similarities between BSA and HSA, BSA has been used as a model protein in research.

Suryanarayana Jammalamadaka and Dwipak Prasad Sahu showing the sensor to detect BSA

Speaking about this research and its applications, Jammalamadaka said that several methods exist to assess the concentration of BSA but they are time-consuming and expensive, requiring skilled operators.

Jammalamadaka further said, "We have developed a memristor to detect BSA. The memristor or Resistive Random Access Memory (RRAM) is a device that can change its resistance state by changing the voltage. The switching from high resistance state to low resistance state with voltage is called SET switching and the reverse is RESET switching."

He added, "We have also tested our device for its durability and found that the device performed reliably continuously for 650 times."

Surge in int'l placements at IIT-H, 38 offers from 15 cos

Times News Network

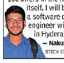
Hyderabad: The number of international job offers at the Indian Institute of Technology, Hyderabad (IIT-H) increased to 38 from 22 last year during phase 1 of placements, which concluded on Thursday.

This year, as many as 483 students had registered for campus placements across all departments for the academic year 2019-20.

A total of 271 offers, including 37 pre-placement offers, from 96 companies were made by the end of phase 1 of campus placements.

"We have received 38 international offers from 15 companies across three countries (USA, Japan and Taiwan) this year as against 22 international offers from eight companies from Japan and Taiwan during last year," said Prof Pradeep Yemula, faculty in-charge (placements), IIT-H.

> Microsoft made 17 offers this year. It was a major boost for students as it was an indicator that the placements this year were much better than last year. We had close to 200 offers in the first two days itself. I will be joining as a software development engineer with Salesforce in Hyderabad
>
> — Nakul Ashilagari, BTECH STUDENT



> I have been placed in Mathworks, a US-based firm as an application support engineer. I have done my masters in machine learning. I always had my eyes on Mathworks. Since the company works on projects related to ML, I am happy I could get through
>
> — Anshika Chaurasia, MTECH STUDENT

Top recruiters included Microsoft, Goldman Sachs, Jaguar Land Rover, Eaton, BNY Mellon, Bajaj Auto & TSMC. Many students will be joining companies based out of Seattle, New York, Tokyo, Hsinchu, Taiwan among others.

"This year, several companies offered jobs in core areas. However, I slightly deviated from my core subject and decided to join NTT Advanced Technology in Tokyo. I will be engaged in development of products in field of internet of things," said Srishti Jain, MTech student from biomedical engineering department.

Most of the job offers were from information technology and information technology services sectors. In the current placement year 2019-20, for circuit branches, the institute has crossed more than 80% of placements during phase 1 itself.

"There was a huge demand for design and software engineers this year. Many companies also came forward to offer research positions to the graduates," said Yemula, adding that the institute surpassed last year's record across two phases.

This year, 251 students were placed at the end of phase 1 as against 239 students placed last year. Placements for phase 2 shall commence from January 2020.

IIT-H collaborates with Japanese institutions

Prof BS Murty, Director, IIT-H with Prof Kazuhiti Hashimoto, president of National Institute For Material Science, Japan

PNS ■ HYDERABAD

Indian Institute of Technology Hyderabad has collaborate with four major institutions in Japan for research in various areas including earthquake engineering besides in joint doctoral programmes. This will be a major boost to Indo-Japanese Collaborations in Academic and Research areas.

> *We have signed MoUs with educational institutions in Japan to have joint supervision programme where research students can go there to continue some part of their research in these institutions, says BS Murthy*

Prof BS Murty, Director, IIT Hyderabad, signed the MoUs with the Institutions during his recent visit to Japan. The Institutions include: MoU with Earthquake Disaster Mitigation Research Division (EDMRD), National Research Institute for Earth Science and Disaster Resilience, on Earthquake Engineering; MoU with Graduate School of Science and Technology, Shizuoka University on Doctoral Degree Sandwich Programme. MoU with Saitama University on Academic Exchange of faculty, students and implementation of cooperative Research Projects and educational programmnes. MoU with National Institute for Materials Science (NIMS)to strengthen Research collaboration

Prof Murty also held discussions with Nagoya Electric Works, Nihon University for a discussion on the Japanese Technical Cooperation Project for Smart Cities for Emerging Countries-based on sensing, network and big data analysis of Multimodal Regional Transport System.

Speaking about the importance of these collaborations, Prof BS Murty, Director, IIT Hyderabad, said, "IIT Hyderabad has signed MoUs with educational institutions in Japan to have Joint supervision programme where research students can go there to continue some part of their research in these institutions."

IIT-H researchers develop model to decipher AI work

INNOVATIVE: *Piyushi Manupriya, Anirban Sarkar, and Vineeth N Balasubramanian, who worked on developing the method.*

CITY BUREAU
Hyderabad

Researchers from the Indian Institute of Technology, Hyderabad have developed a method by which the inner workings of Artificial Intelligence models can be understood in terms of causal attributes.

'Artificial Neural Networks' (ANN) are AI models and programmes that mimic the working of the human brain so that machines can learn to make decisions in a more human-like manner. Modern ANNs, often also called Deep Learning (DL), have increased tremendously in complexity such that machines can train themselves to process and learn from data that has been supplied to them as input, and almost match human performance in many tasks. However, how they arrive at decisions is unknown, making them less useful when the reason for decisions is necessary.

An IIT Hyderabad team led by Dr Vineeth N Balasubramanian, Associate Professor, Department of Computer Science and Engineering, and his students Aditya Chattopadhyay, Piyushi Manupriya, and Anirban Sarkar, approached this problem with ANN architectures using causal inference with what is known in the field as a 'Structural Causal Model.'

Explaining this area of work, Dr Balasubramanian said, "Thanks to our students' efforts and hard work, we have proposed a new method to compute the Average Causal Effect of an input neuron on an output neuron. It is important to understand which input parameter is 'causally' responsible for a given output; for example in the field of medicine, how does one know which patient attribute was causally responsible for the heart attack? Our method provides a tool to analyze such causal effects."

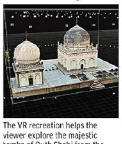
The tool will help tackle lack of transparency in Deep Learning models, used in phones, tablets and television sets, and prevent end-users from losing trust over the system.

IIT-H creates VR retelling of past through the perspective of city founder's daughter

Syed.Akbar@timesgroup.com

Hyderabad: The Indian Institute of Technology, Hyderabad (IIT-H) has created a virtual reality (VR) experience for an oral historical narrative of Begum Hayat Baksh, daughter of Hyderabad's founder Mohammad Quli Qutub Shah V. The technology enables the viewer to visit the majestic tombs of the Qutb Shahi from the comfort of their own location, interacting with the landscape as if almost they were physically present there.

This 360-degree VR animation film trailer talks about Begum Hayat Baksh, one of the most influential women rulers of medieval Deccan. She had contributed to three generations of the Qutb Shahi dynasty and was instrumental in peace treaties between the Golconda kingdom and the mighty Mughal empire.



The VR recreation helps the viewer explore the majestic tombs of Qutb Shahi from the comfort of their own homes

Popularly known as "*Ma Saheba*" (Queen Mother), Hayat Baksh was the mother of Abdullah Qutub Shah VII and wife of Sultan Mohammad Qutub Shah VI. The now extinct lake popularly known as Masab Tank (Ma Saheba tank) was constructed under her orders.

The story of Hayat Baksh is one of women empowerment. "The trailer titled, 'Ma Saheba - The queen of Hyderabad', explores 360-degree VR animation as the latest technology of film," said Prof Deepak John Mathew, head of the department of design, IIT Hyderabad.

Virtual reality, one of the latest technologies in filmmaking, has an advantage of creating an immersive experience. Using the premier technology, the IIT-H team has developed a virtual exploratory landscape which lets the user experience the historical monuments of Qutb Shahi like never before.

"The use of virtual reality-based technology to preserve and explore history is a method that provides results with almost lifelike experiences," says an official statement of IIT-Hyderabad. The VR demonstrations will be available for people for two days from October 11 to 12 at the Hyderabad International Convention Centre. It will be filed as part of the Hyderabad Design Week celebrations.

"This project is initiated with the support of Design Innovation Centre at IIT Hyderabad. The objective is to create a Visual Model of the monuments in India. This is the first attempt in this series," Prof Deepak said.

IIT develops bricks using agricultural waste

NEW DELHI: Researchers at the Indian Institute of Technology have developed 'bio-bricks from agricultural waste products for use in construction.

The invention by the team at IIT Hyderabad in association with KIIT School of Architecture, Bhubhaneshwar, is aimed at serving the dual purpose of waste management and development of eco-friendly and sustainable building material. Priyabrata Rautray, a PhD scholar at IIT and Avik Roy, Assistant Professor, KIIT School of Architecture, received a Special Recognition Trophy for sustainable housing at Rural Innovators Start-Up Conclave 2019 organised by the National Institute of Rural Development and Panchayati Raj (NIRDPR), Hyderabad.

Representational picture

"22 per cent of India's total annual CO2 emissions is by the construction sector. Clay bricks, for example, not only use fertile top soil, but their manufacturing process also emits significant amounts of carbon dioxide into the atmosphere. He explained that the process of making bio-bricks starts with selection of dry agro-waste.

The team used dry sugarcane bagasse. A lime-based slurry is prepared, and the chopped agro-waste is added. This mixture is poured into moulds and rammed with a wooden block to make a compact brick. These moulds are left to dry after which sides of moulds are removed, and the brick is allowed to dry for fifteen to twenty days. Roy said, "Bio-bricks are carbon sinks because they fix more carbon dioxide than they produce during their life cycle."

IIT-H, ItsEV to jointly develop Li-ion batteries for EVs

V RISHI KUMAR
Hyderabad, December 1

Indian Institute of Technology, Hyderabad (IIT-H), in collaboration with ItsEV Inc, plans to develop lithium-ion batteries for various applications, including electric vehicles.

IIT-H and ItsEV Inc expect to come out with a lithium-ion battery that will be superior to the one in use in India.

A research group led by Surendra K Martha, Associate Professor, Department of Chemistry, IIT Hyderabad, has demonstrated that high-energy lithium-ion batteries have twice the energy of similar batteries produced in 2018.

> **A research group led by Surendra K Martha, Associate Professor, Department of Chemistry, IIT Hyderabad, has demonstrated that high-energy lithium-ion batteries have twice the energy of similar batteries produced in 2018**

The researchers have also demonstrated 100-200 mAh sodium-ion cells at the Research Centre Imarat (RCI) in the Defence Research and Development Organisation (DRDO) laboratory, in Hyderabad.

India imports lithium-ion batteries from China, South Korea, Japan and Europe, which are made into battery packs, before marketing. Even though a billion people use lithium-ion batteries, there is not a single indigenous manufacturer. This is significant considering the Government plans to convert 30 per cent of all vehicles on the road into electric ones by 2030.

Jayesh Ranjan, Principal Secretary, Industries, Telangana, said, "Telangana is among the first 10 States to work on policies for the 100 per cent adoption of EV for public transport. This will motivate individuals to go for EV, which in turn willreduce problems such as traffic management and pollution. The introduction of a product like this can be a breakthrough."

Katsuo Matsumoto, Chief Representative, JICA (Japan International Cooperation Agency), India Office, said the Japanese government agency was looking to tap business opportunities of close to ₹2 trillion in India.

He said Japanese institutions were promoting Indian talent through knowledge exchange, and by awarding scholarships. Till date, about 116 students of IIT-Hyderabad have been offered scholarships to study in universities in Japan.

International workshop

An international workshop hosted by IIT-H on the 'Dawn of a New Era for the Indian Automotive Industry' covered the development of new lithium ion battery fit for high temperature conditions, to promote a pollution-free EV.

ItsEV will technical support for training technicians, students and scientists in Japan, so that lithium ion batteries can be developed indigenously.

BS Murty, Director, IIT Hyderabad, said, "This demonstration of a lithium-ion battery operated 3-wheeler electric vehicle (auto) will yield results 10 years down the line. We are looking to tie up with industries to take it for production in India."

A demonstration of an EV 3-Wheeler, developed by ItsEV Inc, Japan, equipped with Japanese Lithium-Ion Batteries, was also held on the occasion.

The battery consists of 16 modules, each having four cells. Each cell has a nominal voltage of 3.75 V. Each module consists of 2 Series and 2 Parallel Cells.

The pack consists of two parallel and eight series modules having nominal voltage of 60V and 130 Ah. The 'EV3Wheeler Lithium Ion Batteries can be charged directly with solar energy, without using electricity. Currently, the solar panels are provided by Sahaj Solar, Ahmedabad.

Device monitors heart in real time

STATE BUREAU
Hyderabad

Indian Institute of Technology-Hyderabad (IIT-H) researchers have developed a low-power device that can monitor electrocardiogram (ECG) and alert patients and doctors in real time about the risk of cardiovascular diseases (CVDs).

Cardiovascular diseases top the list of public health concern compared to other diseases and has almost become the primary cause of human deaths, as per a survey of the World Health Organization (WHO). The main causes include changings trend in lifestyle, unhealthy eating habits, tobacco usage, low fruit and vegetable intake and lack of physical activity and lot of stress.

These factors necessitate developing a personalised CVD monitoring device powered by battery backup and with a very low form factor to achieve unobtrusiveness that works under the emerging cyber-physical system setup.

The device designed by IIT-H team can monitor ECG and alert patients and doctors about the risk of cardiovascular diseases.

This area was researched by a team comprising Vemishetty Naresh. Ph.D. Research Scholar, Advanced Embedded Systems and IC Design Laboratory, Department of Electrical Engineering, IIT Hyderabad and Dr. Amit Acharyya, Associate Professor, Department of Electrical Engineering, IIT Hyderabad.

As a proof of concept demonstration, the researchers have taken healthy and various unhealthy cases from the Physionet database to validate the proposed method. Their research has been published recently in the peer-reviewed international journal Scientific Reports, an online open access, scientific journal published by prestigious Nature Research.

Speaking about the importance of this Research, Dr. Amit Acharyya, Associate Professor, Department of Electrical Engineering, IIT Hyderabad, said, "CVD is one of the deadliest disease and irrespective of the economy of the country people are getting affected by it. It is manifested in different forms necessitating the early diagnosis, therapy and prognosis. Hence the proposed work on the classification is going to be of immense help for the society."

(SEE PAGE 2)

IIT-H, C-MET tie up for e-waste recycling

To encourage cooperation between research groups, researchers

STATE BUREAU
Sangareddy

Indian Institute of Technology-Hyderabad (IIT-H) decided to collaborate with Center for Materials for Electronics Technology (C-MET) to design and develop state-of-the-art processes and equipment in e-waste recycling.

Through this collaboration, the institutions are also planning to offer an M Tech programme in e-waste recycling. The two institutes will also undertake joint research in the same field.

Prof B S Murty, Director, IIT Hyderabad, and Dr N R Munirathnam, Director General, C-MET, with the MoU.

An MoU was signed on December 9 by Prof BS Murty, Director, IIT-H, and Dr NR Munirathnam, Director General, C-MET. C-MET is located in Pune and is an autonomous scientific society under the Ministry of Electronics and Information Technology, Government of India, dedicated to undertaking competent research and development in the firmament of Electronic Materials.

Both the institutions will also encourage cooperation between research groups, researchers and institute staff and their exchange visits for teaching and research. Speaking about the importance of this collaboration, Prof BS Murty, Director, IIT-H, said, "Being a pioneer in research IIT-H will collaborate with C-MET to explore and develop cost-effective and affordable e-waste recycling techniques.

This will also generate a unique opportunity for the young researchers to study at IIT-H and work at C-MET." He elaborated the objectives of the collaboration saying that the design and development of state-of-the-art processes, equipment for e-waste recycling and the jointly conducted M Tech programme in e-waste Management and Recycling was to promote academic and research cooperation between the two institutes.

Joint publications

This would also lead to enhancement of knowledge and vision for the training of human resources in niche and advanced areas of R&D, promote exchange of persons, activities and experience in relevant fields of higher education and research, bring out collaborative research publications and patents, and foster exchange of academic publications and scholarly information.

Highlighting the focus of this collaboration, Dr NR Munirathnam, Director General, C-MET, said the Government of India was laying greater thrust on treatment and management of e-waste.

CAMPUS

CORNER

Every 1st Saturday of the month
as Plantation Day

71st Republic Day Celebration 2020
Parade, Songs, Drama & Music

Success Secrets for Students
By Dr B V Pattabhiram

International Workshop on Dawn of a
New Era for Indian Automotive Industry

SPIC MACAY 2020
Celebration of Dance & Music

E-Summit 2020 by E Cell
Biz Quiz, Panel Discussion, Case Study

Live streaming of Pariksha Pe Charcha
by Honorable P. M. Shri Narendra Modi

FGD cum workshop on Climate Extremes,
Societal Resiliency and Krishna River Basin

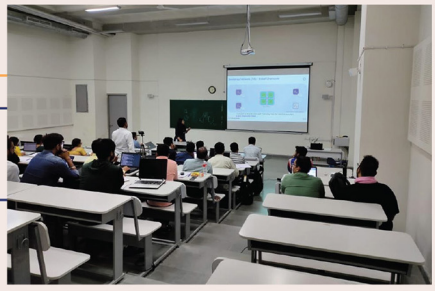
Open Mic Night
by Cultural Club

Happy Pongal / Makar Sankranti
Kite flying, Thug of War & Kho-kho

Lohri Laurels
Bhangda, Bonefire, Dhool & Sweets

Workshop on R & D Projects and
Opportunities in Armament Field

Inauguration of Supermarket,
Amul Center & Multi Speciality Clinic



TEQIP Workshop on
Block chain

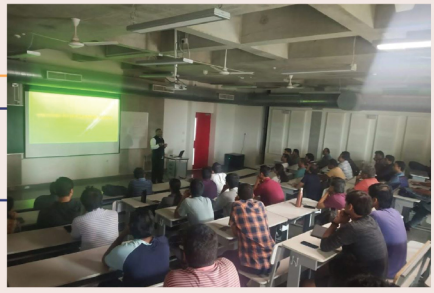
Educational Tour of Gitanjali Digi School to
Artificial Intelligence Facility

IITH finished 8th in Inter-IIT Tech Meet 2019
with 3 Silver & 1 Bronze Medal

6th Indian Control Conference on
Advances in Control & System Theory

Last Plantation Drive of 2019, Royal Palm,
Jacaranda Blue & many were planted

IITH folks & Mr. R.K. Paliwal,
DG of IT (Investigation) at Gonglur Village



Talk on Mental Health by Dr. Naresh Vadhlani,
Chief Consultant Psychiatrist

TEQIP-III workshop on
Advanced Functional Analysis and its applications

70th Constitution Day Celebration
Preamble Reading & Live Telecast

IITH Alumni Day, 1st set Alumni Awards,
Sports, Interactions & Get-together

Inauguration of new
Badminton and Squash Court

Basic Science Training to
29 lecturers from 12 TMRJCs

'Run for Unity' (3 KM) on the occasion of
National Unity Day (Rashtriya Ekta Diwas),

Juggling Workshop conducted by IIT Delhi
Alumnus Mr. Satwinder Singh Setia

8th Annual Convocation
IIT Hyderabad 2019

IITH all set to mentor 1st batch of
Btech CSE of IIIT Raichur from 2019

Onam on campus, the traditional
Kerala feast, enjoying the diversity

New Currency in IITH's BoK

Jan, 2019

Dr. Sameen Naqvi: An ***Assistant Professor at Department of Mathematics.*** Prior to joining the institute in Jan 2019, she worked as a Post Doctoral Fellow at Chinese University of HongKong, Hong Kong, for six months, and at Jiangsu Normal University, China, for one year. She did her PhD in Statistics from IIT Kanpur and her area of research interests include Reliability Theory, Stochastic Orders and Risk Theory.
Life @IITH: Working at IITH has been a wonderful experience as it allows me to learn everyday. With healthy research environment and supporting colleagues, I get a chance to grow and explore more.

Jan, 2019

Dr. Neeraj Kumar: An ***Assistant Professor at Department of Mathematic.*** Dr. Neeraj has done his PhD from University of Genova, Italy, Postdoctoral fellow from Institute of Mathematical Sciences, Chennai (2014-2016). He was a Visiting scientist at Indian Statistical Institute Bangalore (2016, three months), Postdoctoral fellow at IIT Bombay (2016 Nov to 2018 Dec).
Life @IITH: My experience so far has been amazing. I have learnt and experienced so many new things about teaching, research, and administrative aspects of life. IIT Hyderabad is a welcoming place, and from day one, I felt it as my own institute.

Feb, 2019

Dr. Dipankar Ghosh: An ***Assistant Professor at Department of Mathematics*** at IIT Hyderabad, have joined IIT Hyderabad in February, 2019. Before moving to IIT Hyderabad, He was a DST-INSPIRE Faculty at Chennai Mathematical Institute (CMI) for two and a half years. He has completed PhD from IIT Bombay in 2016. His ongoing research is focused on Commutative Algebra.
Life @IITH: It's a great experience being a part of IIT Hyderabad. The friendly environment at IIT Hyderabad, particularly in our mathematics department, not only helped me to excel in my research but also improved my teaching skills.

Feb, 2019

Dr. Satya Prakash Singh: An ***Assistant Professor in the Department of Mathematics.*** He has joined IIT Hyderabad in February 2019. He had worked as a postdoctoral fellow at the Department of Statistics, University of Haifa, Israel for more than two years and completed Ph.D. in 2016 from the Department of Mathematics, IIT Bombay.
Life @IITH: I feel that the work environment here at IITH facilitates you to grow your career as a researcher as well as a teacher. The campus is beautiful and growing.

Mar, 2019

Dr. Sayak Banerjee: An ***Assistant Professor at Department of Mechanical & Aerospace Engineering.*** Dr. Sayak is a Mechanical Engineering graduate from Jadavpur University, completed his Mtech at IIT Kanpur, PhD & post-doctoral studies at Mechanical Engineering department of Stanford University.
Life @IITH: I first joined IIT Hyderabad as a Visiting Professor in 2018. I greatly enjoyed the dynamism and camaraderie amongst my fellow colleagues, the rapid pace of campus infrastructure development, as well as the enthusiasm of the students which made me decide to stay on as a permanent faculty member. I am continuing to develop my research group and experimental facility and look forward to interacting and guiding the students, and collaborating with my peers in developing sustainable energy and transportation technology solutions for the future of the country.

New Currency in IITH's BoK

Apr, 2019

Dr. Amrita Datta: An ***Assistant Professor of Development Studies at Department of Liberal Arts.*** PhD from International Institute of Social Studies, Erasmus University Rotterdam, M. Phil from University of Cambridge, M.A. from Tata Institute of Social Sciences, Mumbai, B.A. Honors in Economics from Lady Shriram College for Women, University of Delhi. Prior to joining IIT Hyderabad, Dr. Amrita has worked at Flame University, Pune; Institute for Human Development, New Delhi; Lee Kuan Yew School of Public Policy, National University of Singapore; and the Indian School of Microfinance for Women, Ahmedabad.
Life @IITH: I am thrilled to have joined the Department of Liberal Arts as it initiated MA and PhD programmes in Development Studies. IITH provides an excellent environment and support for my research, that is closely intertwined with my teaching and pedagogy.

Apr, 2019

Dr. Muvvala Gopinath: An ***Assistant Professor at Department of Mechanical and Aerospace Engineering.*** Ph.D. from IIT Kharagpur (2013-2018) and prior to joining IIT Hyderabad, he was a Senior Scientific Officer at the Department of Mechanical Engineering, IIT Kharagpur (2018-2019). His area of research interest are Laser Material Processing and Additive Manufacturing.
Life @IITH: Impressed with the fractal system which allows the faculty to expose the students to both basic concepts as well to the current cutting edge technologies.

May, 2019

Dr. Suhanya Duraiswamy: An ***Assistant Professor at Department of Chemical Engineering,*** since May 2019. Ph.D. from Department of Chemical and Biomolecular Engineering, National University of Singapore (NUS) and B.E., Chemical Engineering with M.Sc., Physics (Dual degree scheme) from Birla Institute of Technology and Science (BITS), Pilani, India. I am setting up a Micro-Reaction Engineering lab at present.
Life @IITH: These past few months in IITH has been a great experience. All faculty and staff I have interacted with, have been very supportive and have ably guided me through the process of settling into a new work environment. Students are spectacular!

Jun, 2019

Dr. Rogers Mathew: An ***Assistant Professor at Department of Computer Science and Engineering.*** This area of research is in Combinatorics, graph theory, and graph algorithms. He was an Assistant Professor in the Department of Computer Science and Engineering, IIT Kharagpur from January 2015. After completing my Masters (M.E.) and PhD (2012) in Computer Science from Indian Institute of Science Bangalore, he was a postdoctoral fellow at Dalhousie University, Canada (2012-13) and University of Haifa, Israel (2013-14).
Life @IITH: Both professionally and personally, I am enjoying my life at IIT Hyderabad.

Jul, 2019

Dr. Fahad Panolan: An ***Assistant Professor at Department of Computer Science and Engineering.*** Prior to joining IITH, he was a Postdoc during Jan-16 to Jun-19, in the department of Informatics, University of Bergen, Norway. He has obtained a PhD in Theoretical Computer Science from The Institute of mathematical sciences, Chennai in 2015. He work mainly in the areas of multivariate analysis of algorithms, graph theory and approximation algorithms.
Life @IITH: IITH is a friendly institute academically and socially. It provides academic freedom that allows me to offer new courses and do research projects with students and faculties.

New Currency in IITH's BoK

Jul, 2019

Dr. Abhishek Kumar: An ***Assistant Professor at Electrical Engineering department.*** Dr. Abhishek has a Ph.D. from IIT Madras in July 2018. M.E. degree in microelectronics from the Indian Institute of Science, Bengaluru, India, in 2011. he interned at Qualcomm, Bengaluru, in 2014 and designed voltage-controlled oscillators for cellular transceiver IC. After Ph.D., he worked as a Senior Project Officer in a team at IIT, Madras.
Life @IITH: I joined the Department of Electrical Engineering, IIT Hyderabad in July 2019 and have been thoroughly enjoying the stay.

Aug, 2019

Dr. B. S. Murty: ***Director at IIT Hyderabad,*** Professor Murty was at IIT Madras as an Institute Professor and Girija & R. Muralidharan Chair Professor at the Department of Metallurgical and Materials Engineering. His academic journey started with a Diploma in Metallurgy followed by BE from VRCE Nagpur, ME from IISc Bangalore and his PhD from IISc, Bangalore. He has served IIT Kharagpur as faculty at the Department of Metallurgy & Material Engineering during 1992 - 2004 & at IIT Madras during 2004 - 2019.
Life @IITH: This 6 Months at IITH was very refreshing for me, getting along with the young minds has added to this experience. I am confident with their caliber & capability they can excel in their respective field of interest & research in the future.

Sep, 2019

Dr. Niranjan S. Ghaisas: ***Assistant Professor at Department of Mechanical and Aerospace Engineering,*** Dr. Niranjan has done Btech from IIT Kharagpur, M. S. from IISc Bangalore and PhD from Purdue University. He has Postdoctoral research experience at University of Delaware and Stanford University
Life @IITH: My first few months at IITH have been quite pleasant thanks to the friendly, helpful and motivated faculty and staff as well as the vibrant student community.

Sep, 2019

Dr. Krishna Gavvala: An ***Assistant Professor at Department of Chemistry. Dr. Krishna*** has done his BSc from University College of Science, Osmania, MSc (Chemistry) from Indian Institute of Technology (IIT), Roorkee and PhD (Chemistry) at Indian Institute of Science Education and Research (IISER), Pune, India.
Life @IITH: With 2 months of my stay at IITH I found that this is the best place to begin my career. Major strengths of IITH are the distinguished faculty, well cooperative staff and unique academic curriculum, the best of any other IITs. The main campus of IITH has equipped with the state-of-art facilities for cutting edge research activities that push the faculty beyond boundaries. Overall it is an amazing place to live, learn and grow.

Oct, 2019

Dr. Shashank Vatedka: An ***Assistant Professor at Department of Electrical Engineering.*** Dr. Shashank has done MSc (Engineering) and PhD degrees from the Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore. He has spend two years at the Chinese University of Hong Kong, first as a research assistant and then as a postdoctoral fellow. Subsequently, he went to Telecom Paris in Paris, France for another year of postdoc.
Life @IITH: It has been great! My colleagues have been very friendly and helpful in making sure that I've settled down, and teaching bright students is fulfilling. I look forward to contributing more professionally and towards the growth of the institute.

New Currency in IITH's BoK

Nov, 2019

Ms. Mitalee Agrawal: ***Public Relations Officer at IIT Hyderabad.*** Prior to joining IIT Hyderabad, she has worked in University of Hyderabad as Assistant Registrar - Market Strategies and Signode India Limited (A leading Packing MNC in Hyderabad) as Manager – Techno-commercial with around a decade experience in brand building and marketing strategies. She has Mtech in Digital Communication and BE in Electronic and Communication Engg. from RGTU, Bhopal and a PGDBM from University of Hyderabad.
Life @IITH: Its like dream to have your passion as your profession. Proud to be associated with IIT Hyderabad. Looking forward to contribute by best for the best of the institute.

Dec, 2019

Dr. Joyjit Kundu: An ***Assistant Professor in Department of Physics,*** His Research Interests are Statistical physics of soft matter systems, materials science. He was a Postdoctoral Associate, Duke University, NC (2017-2019), Postdoctoral Fellow, Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA (2015-2017). He has done his PhD from Institute of Mathematical Sciences, Chennai (2010-2015), MSc from IIT Madras, Chennai (2008-2010) and BSc from Jadavpur University, Kolkata (2005-2008)
Life @IITH: The transition was smooth and everyone was very welcoming. To me, IIT Hyderabad is a place that promotes a vibrant and collaborative scientific culture.

Dec, 2019

Dr. S K Zeeshan Ali: An ***Assistant Professor in the Department of Civil Engineering.*** Dr. Zeeshan has done his Mtech and PhD from IIT Kharagpur, B.E. from Jadavpur University. Worked as Research Associate in the Department of Civil Engineering Indian Institute of Technology Kharagpur, India.
Life @IITH: In recent years, IIT Hyderabad has grown up tremendously in multifarious activities, including academics and high-quality research. I appreciate the likely environment of IIT Hyderabad, and in particular, feel honored to be a part of the great family of IIT Hyderabad.

Happy Alliances

Mr. Jayesh Ranjan, IAS, *Principal Secretary to Government of Telangana, Industries & Commerce (I&C) Department & Information Technology, Electronics and Communications (ITE&C) Department*

IIT Hyderabad is one of the finest institution with which the Government of Telangana is associated for the Technological upliftment of the State of Telangana. In the recent past, we could get connected to the IIT Hyderabad. An MoU also has been signed between Government of Telangana and IIT Hyderabad as per part of "2020 - A year of AI" in the month of January 2020. IIT Hyderabad is a pioneer in the field of Artificial Intelligence being the first Institute in the country to launch a B.Tech. program in AI. We value the research capacity and capability possessed by IIT Hyderabad faculty, the world-class infrastructure with IIT Hyderabad to promote research and strong commitment of the institute towards research and development in almost all major areas. Looking forward to strengthen this association so that together we can do something good for the society, environment and mankind.

Professor Eric Laenen
(University of Amsterdam, Netherlands; Member of CERN Council)

The visit to IIT Hyderabad for a SPARC workshop, involving a joint programme in theoretical particle physics of IITH, IMSc Chennai, and the Universities of Torino and Amsterdam, was wonderful. The programme involves an ambitious research programme relevant for the CERN LHC collider, lectures series at IITH and PhD student exchanges - some IITH students already spent several weeks with me in Amsterdam. The work presented at the workshop by in particular the PhD students and the postdocs was of high caliber. It was especially nice to see so many spontaneous interactions and discussions among them, which I would very much encourage them to keep up. The excellent organization of Dr. Anurag Tripathi and his team, the warm hospitality and the high quality facilities of IIT Hyderabad were very instrumental in making the workshop a success. In fact I am staying for some weeks further at IITH for lectures and collaboration, to which I am very much looking forward.

Prof. Lorenzo Magnea
(Head of Theory Group, Department of Physics, University of Torino, Italy)

It was a great pleasure for me to spend two weeks at IIT Hyderabad for the second time, after delivering a set of GIAN lectures in 2017. It is very impressive to see how fast the institution is growing, not only in terms of new buildings, but with a rapid expansion of the faculty and of the student body, and while maintaining excellent standards of research. Thanks to the SPARC network involving also IMSC Chennai, and the Universities of Amsterdam and Torino, we have been able to set up exchanges of PhD students, lecture series, and the international Workshop on `Precision QCD@LHC', held last week. This will no doubt lead to long-lasting and fruitful scientific collaborations. I must thank Prof. Anurag Tripathi and his team for their remarkable organizing effort, and the IITH as a whole for the kind hospitality. I am very much looking forward to the continuation of our common research projects.

Happy Alliances

Mr. Sumeet Verma, *Director, Strategic Engagements, Intel India*

IIT Hyderabad and Intel India have had a continuous and a long standing relationship since quite a few years. We have been working together on some of the high impact research projects in the areas of Artificial Intelligence/Machine Learning, Communications, Architecture etc., through academic research projects and fellowships. All these are shaping up very well and our experience has been excellent so far.

My sincere thanks to Prof. B S Murty for his wonderful support and close corporation, which is providing all of us with an opportunity to extend this collaboration on multiple areas which should have manifold impact in the future. I would like to also extend gratitude to Dr. Bheemarjuna Reddy, Prof. Antony Franklin, Dr. Vineeth N Balasubramanian and Dr. Sumohana for the ongoing collaborations which should be fruitful for all. I'm sure we can together create tremendous value for both organizations and for the Indian tech ecosystem. We greatly look forward to more such future engagements with IIT Hyderabad, and continue our support towards enhancing Research and Development in India.

Mr. Anand Ramamoorthy, *Managing Director, Micron India*

IIT Hyderabad's commitment to research and strong faculty and student body in the areas of IC and memory design will present scalable opportunities for partnership with Micron. As the world's foremost memory maker, Micron believes in investing in and nurturing young engineers in the formative college years. When I look back at my college days, the friendships I made resonate more clearly than the marks I scored. Results are important, but the strength of your networks will always get you further. And as you go further in life and in work, rest assured, you will fall – we all do! At the risk of sounding like a Rocky movie, you must dust yourself off and keep moving forward – that's how winning is done! When you look back, it will not be the money you made or the patents you won, it will be the people you nurtured and the goodwill you generated that will hold more meaning.

I wish you the very best.

Mr. Tasleem Arif, *Vice President and Head R&D, OPPO India*

At OPPO, we focus our efforts on bringing customer centric innovation and embrace OPPO's value to explore, refine and optimize products. With this vision, we partnered with IIT Hyderabad to create tremendous value and opportunity in the technology ecosystem in India. We are delighted to work together with IIT Hyderabad in enhancing the Research and Development initiatives and build localized solutions for the Indian smartphone market. With combined efforts, we aim to strengthen our relationship with IIT Hyderabad pave the way to initiate quality research and promote the rapid integration of cutting-edge technology, particularly in the areas of 5G and AI"

Ask your Alumni

Dr. Mahendra Kumar Pal,
Researcher,
Hyogo Earthquake Engineering Research Center (E-Defense)
National Research Institute for Earth Science and Disaster Resilience (NIED)

1. Tell a little about yourself?
Currently, I am working as Associate Research Fellow at Earthquake Disaster Mitigation Research Division (nicknamed as E-Defense) of National Research Institute for Earth Science and Disaster Resilience (NIED), Japan.
Our laboratory houses world's largest Shake table test, where full-scale building structures can be tested for their resilience against strong earthquake.

2. What made you to join IIT, Hyderabad?
An interdisciplinary master course (combining structures and geotechnical) offered at Civil Engineering department of institute was the primary reason for me to join the dept. Secondly, institute was recommended to me by multiple professors at IIT Bombay and IIT Roorkee during my interview at those places.

3. Why did you choose your major/ Institute?
What subject did you enjoy most? Least?
Numerical methods for Engineers and Finite Element Classes are the two subjects I enjoyed the most.

What other activities were you involved in?
Training and Placement Representative, Department Representative and Mesh Secretary, Sports only for fun

What specialized training have you had?
Attended a couple of workshops and seminar jointly organized by IITH, IIIT Hyderabad and JNTU, Hyderabad

How have your education and training prepared you for your current job role?
It has built the very foundation for my current research work. More than that I have learnt the research attitude, which I believe is best training I have received at IIT Hyderabad.

4. Best moment you can recall from yours' life @ IIT Hyderabad?
Receiving Academic Excellence Award from Dr. APJ Abdul kalam and Graduation ceremony would be top two moments.
However, every day spent at IIT Hyderabad hostel is nostalgic moment.

5. What message you want to convey to the existing student folk @ IIT, Hyderabad?
Have confidence and faith in yourself. One fine day your dream will come true given that you are persistent and determined.

6. What as per you is best about IIT, Hyderabad and please suggest an improvement area for betterment?
Interaction between students and teachers had been the best thing about IIT Hyderabad. I don't think I am eligible to comment on what can be changed.

7. What is the best way to contact you?
I would say Email. It's little old school. But, unfortunately, I not quite active on SNSs.

8. Any Other message you want to communicate!
Enjoy your college days.

Ask your Alumni

Mr. Shalu S. Kumar
B.Tech, Batch of 2015
Department of Chemical Engineering
IIT Hyderabad

1. Tell me a little about yourself?
I graduated in chemical engineering in 2015. I was part of the pioneer B.Tech batch of chemical engineering in IIT Hyderabad. After completing my graduation, I joined Tata Motors as a GET, where I was given a production manager profile. After working there for about 3 years, I joined ISB for their MBA program. Post ISB, I joined Amazon in their operations leadership program – BOLD.

2. What made you to join IIT, Hyderabad?
Honestly speaking, joining IIT Hyderabad was a big leap of faith, which turned out for the good.

3. Why did you choose your major/ Institute?
What subject did you enjoy most? Least?
Most – Heat transfer by Dr Vinod Janardhanan
Least – Physics troubled me a lot.

What other activities were you involved in?
I was involved with ELAN as a volunteer and a coordinator. Subsequent two years, I served as a General Secretary of the Student Body and Student Counsellor in the counselling cell, Sunshine.

How have your education and training prepared you for your current job role?
Though my current role is far from a core-technical role, what's common in chemical engineering and e-commerce logistic operations is the importance of flows. Thus, unconsciously the chemical engineer inside me is still at work.

4. Best moment you can recall from yours' life @ IIT Hyderabad?
It's difficult to pick one moment among the innumerable good times I've had at IITH, but playing football in the rain with my folks takes the cake.

5. What message you want to convey to the existing student folk @ IIT, Hyderabad?
You're in IITH because of your intellect and caliber. Let no one make you believe otherwise, even yourself. IITH folks was one of the best crowds I've had the opportunity to connect with and the faculty are one of the best in the country, each one has their own styles and strengths. These years are going to be the best years of your life, cherish every moment and make the most out of it.

6. What as per you is best about IIT, Hyderabad and please suggest an improvement area for betterment?
I think one of the main reasons IITH is on the map, being a young institution, is its focus on academics. Prof. U B Desai has been the architect for this. One thing which we lacked during our time was industry exposure. With my limited interaction with Director Dr B. S. Murthy, I've learnt that IITH is taking steps to bridge that gap. Alumni can play a crucial role here.

7. What is the best way to contact you?
LinkedIn - https://www.linkedin.com/in/shaluskumar/

8. Any Other message you want to communicate!
IITHAA is in its growth stage. Appealing to all alumni/students to take part in its activities in any way possible. Let's make a closely knit IITH.

Wall of Fame

DAE Young Achiever Award to Dr. Chandra Shekhar Sharma

Dr. Manohar Kaul, Mr. Jatin Chauhan & Mr. Deepak Nathani Paper was accepted at Intl. Conf. on Learning Representations 2020

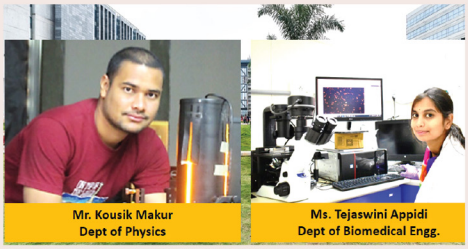
Dr. Anil Agarwal has been jointly awarded the Young Turk of Composites Award 2019-20

Dr. Syed Quadir Moinuddin won the 'Weldwell Speciality Award 2019'

Mr. Mamidi Suresh got 1st prize in the Best Poster Award during the 2nd Annual IISER Pune – KPIT Intl. PhD Conf.

Ms. Swarnalatha Mailaram, Mr. Nitesh Dobhal & Mr. Sunil K. Maity won the 'Best Paper Award' during the 7th ICAER 2019 Conference.

TAS Awards for Dr. Debaprasad Shee, Dr. D. S. Sharada & Dr. Sai Santosh Kumar Raavi



Mr. Kousik Makur & Ms. Tejaswini Appidi selection for the Newton Bhabha Programme

T. Appidi, R. Srivastava, Tejaswini Appidi, Deepak Bharadwaj & Dr. Arvind Rengan won Best Poster Award at IEEE NMDC 2019 Conf., Stockholm

Ms. Poonam Rani won 'Best Poster Presentation' Award - National Conf. on Solid State #Ionics held at IIT Roorkee

Pinaka, by Mr. Akash Banerjee, Ms. Eti Chaudhary and Dr. Saurabh Joshi placed 3rd in Reach Safety-Floats subcategory

IIT Hyderabad students win Smart India Hackathon 2019

Ms. Ankita Kolay has won Metrohm Young #Chemist Award

Ms. Poonam Meena won Bronze medal in Women Long Jump during Inter-IIT Sport Meet. IITH secured total 6 Medals in Inter - IIT Meet 2019, 3 Silver & 3 Bronze Medals

Mr. S. Yempalle's Animated short film 'Ek Cup Chaha' has won 3 awards at Anifest 2019

Please send your suggestions to

Public Relations Officer

A-718/G,
Indian Institute of Technology Hyderabad,
Kandi, Sangareddy - 502285, Telangana, India

Landline: **+91 40-2301 6152**
Mobile: **+91 83310 36099**

E Mail: **pro [at] iith [dot] ac [dot] in**

Designed at **DOD-IITH,**
Design & Layout by Head, **Department of Design, Prof. Deepak John Mathew**