

# Campus diary

March - April 2017

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INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

## IIT Bombay Celebrates 58<sup>th</sup> Foundation Day

- \* 11 alumni received Distinguished Alumnus Awards
- \* 2 alumni honored with Young Alumnus Achievers Awards
- \* 2 faculty members awarded for excellence in research work



Chief Guest Mr. Sanjay Mashruwala, Managing Director, Reliance Jio Infocomm Limited, Prof. Devang Khakhar, Director, IIT Bombay, Prof. Ravi Sinha, Dean (Alumni & Corporate Relations) and Prof. P.V. Balaji, Dean (Research & Development) with the awardees on the Foundation Day

The Indian Institute of Technology Bombay celebrated its 58<sup>th</sup> Foundation Day on March 10, 2017. The foundation stone for the internationally-recognized Institute was laid by Pandit Jawaharlal Nehru, then Prime Minister of India on March 10, 1959. IIT Bombay was the second IIT to be established in the country and the first one to be established with foreign aid received from UNESCO. Since then, the Institute has grown from strength to strength and is now counted among the best engineering institutions across the globe.

Like every year, the Institute felicitated its select alumni for their achievements in diverse fields ranging

from academics, research and entrepreneurship. Mr. Sanjay Mashruwala, Managing Director of Reliance Jio Infocomm Limited and the Chief Guest for the function, gave away the **Distinguished Alumnus Awards, Young Alumnus Achiever Awards, the 'Prof. S.C. Bhattacharya Award for Excellence in Research in Pure Sciences' and 'Prof. H.H. Mathur Award for Excellence in Research in Applied Sciences'**.

The Institute had long felt the need to recognize the alumni of IIT Bombay, who have excelled in their field of work and made the Institute proud. With this intention, the Distinguished Alumnus Awards (DAA) had been instituted.

The 'Prof. S.C. Bhattacharya Award for Excellence in Research in Pure Sciences' was conferred on **Prof. Amiya Pani**, Department of Mathematics. The 'Prof. H.H. Mathur Award for Excellence in Research in Applied Sciences' was conferred on **Prof. Rinti Banerjee**, Department of Biosciences and Bioengineering.

The Young Alumni Achiever Awards (YAAA) are for alumni who have made outstanding achievements in their chosen field of work and are below 40 years of age. These awards were instituted in the year 2011.

The winners include:

- **Prof. Pramod Reddy**
- **Mr. Prashant Mali**

On the occasion, Prof. Devang Khakhar, Director of IIT Bombay spoke at length about the achievements of the

Institute. Referring to the brain drain from India, he said, *"Today, the situation is much different with more than 86% finding work in India and making great contributions. Looking back over the 68 years, I feel that the hopes and dreams of the founders of the IITs are largely fulfilled. We have a lot to be proud of and celebrate on this Foundation Day."*

Reporting about the Institute's progress, he said, *"The progress of the Institute on all fronts has been very good. Today we have more than 10,000 students on the rolls and more than Rs 300 crore of research funding per year. 18% of the students are women. We have been able to recruit outstanding faculty over the years and have more than 620 faculty members on the rolls at present. Last year, 41 faculty members joined, 30% of whom were women."* All in all, the event was a great success, with participation from students, alumni and faculty.

### DISTINGUISHED ALUMNUS AWARDS



**Prof. Ajit C. Tamhane**, (Mechanical Engineering, B.Tech., 1968), Senior Associate Dean, McCormick School of Engineering & Applied Sciences, Northwestern University; Professor of Industrial Engineering & Management Sciences (IEMS), (**Prof. Suhas S. Joshi**, Head, Department of Mechanical Engineering, receiving the award on behalf of Prof. Ajit C. Tamhane)



**Mr. Paritosh K. Choksi** (Mechanical Engineering, B.Tech., 1975), COO, ATEL Capital Group, Board Member of Syntel, Inc. (A Nasdaq company) Lead Director; ATEL Capital Group (US Company); Guidance ATEL Investments Limited (Kingdom of Saudi Arabia Incorporated)



**Mr. Parag Saxena** (Chemical Engineering, B.Tech., 1977), Founder and CEO of Vedanta Capital and NSR New Silk Route Growth Capital, (Mr. Dhananjay Saheba, Alumni receiving the award on behalf of Mr. Parag Saxena)



**Dr. Narendra D. Joshi** (Mechanical Engineering, B.Tech., 1979), Chief Scientist, General Electric Global Research Center and Advanced Propulsion Technologies Leader





**Dr. Mukta Ghate Farooq** (Metallurgical Engineering, B.Tech., 1983), Fellow at Globalfoundries and the technology leader for Advanced Silicon Packaging



**Mr. Ardeshir Contractor** (Mechanical Engineering, B.Tech., 1984), Founder & CEO of Kiran Energy



**Prof. Nitin P. Padture** (Metallurgical Engineering, B.Tech., 1985), Otis E. Randall University Professor in the School of Engineering and Director of Institute for Molecular and Nanoscale Innovation at Brown University, Providence, Rhode Island, USA



**Mr. Rajesh Subramaniam** (Chemical Engineering, B.Tech., 1987), Chief Marketing Officer & Executive Vice President for FedEx Corp.



**Prof. Umesh Vasudeo Waghmare** (Engineering Physics, B.Tech., 1990), Professor in the Theoretical Sciences Unit, and the Dean, Academic Affairs, JNCSAR, Bengaluru and Secretary of Indian Academy of Sciences, Bengaluru



**Dr. Ganesh Natarajan** (School of Management, PhD, 2005), Chairman of 5F World Ltd./ Global Talent Track Ltd., Chairman of NASSCOM Foundation and President of HBS Club of India



**Dr. K. Sivan** (Aerospace Engineering, Ph.D, 2006), Director, Vikram Sarabhai Space Center in Thiruvananthapuram

### YOUNG ALUMNI ACHIEVER AWARDS



**Prof. Pramod Reddy** (Mechanical Engineering, Dual Degree 2002), Associate Professor in the Department of Mechanical Engineering and Materials Science and Engineering at University of Michigan, Ann Arbor



**Prof. Prashant Mali** (Electrical Engineering, Dual Degree 2003), Associate Professor in the Department of Bioengineering at the University of California San Diego, USA. (**Prof. B. G. Fernandes**, Head, Department of Electrical Engineering receiving the award on behalf of Prof. Prashant Mali)

### Prof. S.C. Bhattacharya Award for Excellence in Research in Pure Sciences

### Prof. H.H. Mathur Award for Excellence in Research in Applied Sciences



**Prof. Amiya K. Pani**, Department of Mathematics



**Prof. Rinti Banerjee**, Department of Biosciences and Bioengineering



## Delegates From Tokyo Institute Of Technology Visit IIT Bombay



Delegates from Tokyo Institute of Technology, Japan at IIT Bombay to promote various academic programmes

A team of 4 members from Tokyo Institute of Technology, a national university in Japan, visited IIT Bombay on March 1, 2017. The institute ranks within 100 in the world and ranks 14 in Asian University ranking. The main objectives of the visit was to promote co-operation between Tokyo Institute of Technology and IIT Bombay for MoU agreements, conduct joint workshops proposed in the areas of Chemical Engineering and Materials Science as a start to build relationship between the two institutions, become a pioneer to build relations for the various programmes and facilitate joint supervision for PhD

programme and Dual Degree – PhD. Students Exchange programmes. The Japan Institute Cooperation Agency is coming up with Innovative Asia Programme, which offers scholarship for students pursuing Masters and PhD. The entire funding would be taken care by JICA. They will focus on 12 Asian countries with opportunities to conduct research, enroll in masters and doctoral degree programs in Japan universities and intern in Japanese companies.

## Cathy O'Dowd Impresses IIT Bombay Students

International motivational speaker Ms. Cathy O'Dowd interacted with IIT Bombay faculty, student, staff and alumni on March 15, 2017. She shared the challenges she and her team faced while climbing the Mt. Everest, the failures they faced as a team and stressed on being mentally flexible and team spirit to achieve heights. Ms. Cathy and her team have discovered a new route to climb Mt. Everest.

*“Take failure in your stride, learn from your mistakes and continue the path of achieving your dreams. Each of us has our own mountain of fear to climb, which we can with courage,”* she said.

The session was organised by the Counselling Care Centre, Women's Cell and Institute Cultural Council.



Ms. Cathy O'Dowd, International motivational speaker during her visit at IIT Bombay

## Mozilla Declares IIT Bombay's 'Project Gram Marg Solution for Rural Broadband' Winner of Equal Rating Innovation Challenge



*Dr. Sarbani Banerjee Belur, Senior Project Research Scientist in the Gram Marg TV White Space project at the Department of Electrical Engineering, IIT Bombay presenting Gram Marg Solution for Rural Broadband at Mozilla's Equal Rating Conference in New York City*

Global non-profit organization Mozilla announced IIT Bombay's project '**Gram Marg Solution for Rural Broadband**' the winner of its 'Equal Rating Innovation Challenge'. The Mumbai-based Project Gram Marg will receive USD125,000 (INR 82 lakhs) in funding for its unique affordable broadband initiative.

The project won by an overwhelming margin. The competition called for initiatives to make affordable Internet available to all. The challenge received 100 submissions from 27 countries. The final shortlist of best five entries was prepared after deliberations by an esteemed panel of expert judges from around the world. Nearly 6,000 votes were polled in the online community voting in the final phase of the competition, with Gram Marg and Zenzeleni emerging as the leading vote-getters.

Gram Marg, which roughly translates as "roadmap" in Hindi, seeks to bring 640,000 villages in rural India online. Spearheaded by professor Prof. Abhay Karandikar and Institute Chair Professor of Electrical Engineering Dr. Sarbani Banerjee Belur, a Senior Project Research Scientist, the project reinforces the remarkable progress such communities could achieve once they have access to information pertaining to education, health and the political process.

In its bid to both bridge the digital divide and empower unconnected communities, the Gram Marg team has

created an ingenious and "indigenous" technology that utilizes unused white space on the TV spectrum to backhaul data from village wifi clusters to provide broadband access (frugal 5G). The team of academics and field workers leverages what people already have in their homes, and creates rugged receivers and transmitters to connect villages in even the most difficult terrains. The solution has been rolled out in 25 villages on a pilot basis so far.

Reacting to the honour, Prof. Karandikar said, "We are humbled by the judges' decision and the community votes that choose our solution as the winner. All semifinalists were equally competitive. It was really a challenge to pitch our solution among them."

He further added, "We will continue to improve our technology solution to make it more efficient. We are also working on a sustainable business model that can enable local village entrepreneurs to deploy and manage access networks. We believe that a decentralized and sustainable model is the key to the success of a technology solution for connecting the unconnected. We are also evaluating an applications and services model to enable local village populations to reap the full benefits of broadband access. We hope that our model can be aligned with our Prime Minister's vision of 'Broadband for all' under the government's Digital India program".



Following the announcement, Katharina Borchert, Chief Innovation Officer at Mozilla, noted in a blog post, “Mozilla started this initiative because we believe in the power of collaborative solutions to tackle big issues. We wanted to take action and encourage change. At Mozilla, our commitment to Equal Rating through policy, innovation, research and support of entrepreneurs in the space will continue beyond this Innovation Challenge, but it will take a global community to bring all of the internet to all people. We’re incredibly honoured that part of this global community came together and engaged with us through this Innovation Challenge. We’re excited and optimistic about the road ahead.”

Lauding project Gram Marg’s initiative, one of the Judges, Nikhil Pahwa, founder of Medianama.com and co-founder of SaveTheInternet.in observed, “What impressed me particularly about Gram Marg was the fact that they were able to bring the cost of the technology for delivering broadband over the TV White Space spectrum down to a fraction of the cost. This

The key goal of Afri-Fi is to create a sustainable business model by linking together free wifi networks throughout South Africa and engaging users meaningfully with advertisers so they can “earn” free wifi.

The “Most Novel” award worth USD 30,000 went to Bruno Vianna and his team from the Free Networks P2P Cooperative, which is building on the energy of free networks movement in Brazil to tackle the digital divide. Rather than focusing on technology, the Coop has created a financial and logistical model that can be tailored to each village’s norms and community. The team experiments with ways to engage communities through “barn-raising” group activities, deploying “open calls” for leadership to reinforce the democratic nature of their approach, and instituting a sense of “play” for the villagers when learning how to use the equipment.

Mozilla, the non-profit organization behind the open source browser Firefox, launched the ‘Equal Rating Innovation Challenge’ in October 2016 as part of its endeavour to help catalyze new thinking and innovation for providing open internet access to communities living without it. It called out to entrepreneurs, designers, researchers and innovators from all over the world to propose creative and scalable ideas that can cultivate digital literacy and provide affordable access to the full diversity of the open internet. Mozilla offered awards totalling USD 250,000 (INR 164 lakhs) in funding and expert mentorship to bring these solutions to the market.



Prof. Abhay Karandikar, Dean (Faculty Affairs) and Professor in Department of Electrical Engineering, along with Gram Marg team

spectrum allows delivery of broadband without line of sight connectivity. As a result, it is more useful across hilly terrain, and can help bring cheaper Internet access to those areas. The technology will be open source, which means that it will be accessible to anyone anywhere.”

The runner-up award of USD 75,000 went to Afri-Fi: Free Public WiFi, led by Tim Human from South Africa. The project is an extension of the successful project Isizwe, which offers 500MB of data for free per day.

**About Mozilla:**

Mozilla is a pioneer and advocate for the Open Web for more than 15 years. They create and promote open standards that enable innovation and advance the web as a platform for all. Today, hundreds of millions of people worldwide use Mozilla Firefox to experience the web on computers, tablets and mobile devices.

## IIT Bombay Releases Report on “Estimating the Rooftop Solar Potential of Greater Mumbai”



Release of the report “Rooftop Solar Potential of Greater Mumbai” by Mr. Rajeev Kapoor, Secretary of the Ministry of New and Renewable Energy (MNRE)

Mr. Rajeev Kapoor, Secretary of the Ministry of New and Renewable Energy (MNRE), Government of India visited the Indian Institute of Technology Bombay on April 10, 2017 to release a Report entitled, **“Estimating the Rooftop Solar Potential of Greater Mumbai”**. The National Solar Mission of the Government of India envisages an ambitious target of 100 GW of solar energy to be installed in the country by 2022. This would not only provide a green and clean source of energy for the country and provide access to electricity in remote areas but also enable India to meet its commitments made at COP-21 in Paris.

Of the 100 GW, it is planned that 40 GW would come up on rooftops across the country. With the cost of solar energy having come down significantly over the last few years, and most states having implemented net-metering policies, rooftop installation has become very viable. Many urban as well as semi-urban areas can generate a lot of power.

In order to assess the solar rooftop potential of Greater Mumbai, and to simultaneously develop a methodology that could be used anywhere in the country, five organizations got together to work on this problem.

They are the National Centre for Photovoltaic Research and Education (NCPRE) at IIT Bombay, the Centre for Urban Science and Engineering (C-USE) at IIT Bombay, the Observer Research Foundation (ORF), Bridge to India and IEEE Bombay Section. Each entity provided a unique capability and expertise which made the work possible. The team employed a variety of inputs and techniques, including GIS mapping of all structures in Mumbai, ward-by-ward division, existing land use (ELU) maps of BMC and 3D mapping to discount areas covered by shadowing. The computer based analysis was supported and verified by site visits to some locations (conducted by student volunteers), and discounting of ‘weak’ structures which would not support solar panels.

The result of the exercise is that the team could show that Mumbai has a potential of 1,720 MW of solar energy across rooftops on residences, educational institutions, commercial buildings, government buildings and industry. Furthermore, the team used only open-source software and have described the methodology in detail, so that a similar study could be replicated in urban and semi-urban areas across the country.



## Students Celebrate AAKAAR Technical Festival



AAKAAR, the annual technical festival of the Department of Civil Engineering in IIT Bombay, was held on March 4-5, 2017 this year. AAKAAR lays foundation for the emerging technological advancements, provides a much-needed lift to ideas and innovations and creates a platform for budding engineers across the country to create, innovate and learn various aspects of civil engineering. In the previous year, AAKAAR witnessed a footfall of 15,000+ students representing their colleges and showcasing their talent. In its ninth edition, AAKAAR achieved new mileages.

**Symposium: International Civil Engineering Symposium (ICES)** is a platform for young and budding researchers of the nation to present their work before the most experienced professors of the country in the respective field of civil engineering.

**Competitions:** AAKAAR gives students the opportunity to interact and compete with the brightest minds of the country. The organizing team tries to initiate innovative competitions every year to develop a keen interest among participants for civil structures. Competitions lined up for this year were Bridge-IT, Conquer-IT and SeismiC. Smart Pitch Competition was a unique competition, which offered a unique opportunity to students to directly get involved in the development and grooming of smart cities.

**Events:** AAKAAR also provided students a fine opportunity to try their hands at professional softwares and get insight from eminent industrialists and academicians. This year's events included CENEx, workshops and lectures by:

- **Mrs. Ashwini Bhide**, Managing Director, Mumbai Metro Rail Corporation
- **Prof. Mahesh Tandon**, Managing Director, Tandon Consultants Pvt. Ltd.
- **Mr. Nilotpol Kar**, Business Director, South Asia, BASF India Ltd.

Aakaar is a great platform for students across the country to showcase and enhance their skills at the highest level. Since its inception in 2009, the main purpose of the festival is to promote cross-cultural miscellany and provide a joint platform for students of the civil engineering fraternity from all strata of society to interact and assist the flow of knowledge. Various informal events are held to connect the participants with each other and expand their social group.

## Mango Leaves Yield Fluorescent Graphene Quantum Dots

By heating dried mango leaf extract, researchers have synthesized fluorescent graphene quantum dots that can be used for bioimaging and as intracellular temperature-sensing probes. Existing fluorescent materials, such as organic dyes, metal clusters and quantum dots, are toxic to biological cells and unstable when exposed to light.

In search of a biocompatible fluorescent material, scientists led by Rohit Srivastava from the Indian Institute of Technology Bombay prepared fluorescent graphene quantum dots by heating dried mango leaf extract in a domestic microwave oven. They then explored the quantum dots' potential for bioimaging and temperature-sensing in specific mice cells.

When incubated with the mice cells, the quantum dots easily permeated the cell membrane without disrupting the proliferation and viability of the cells. This shows that the dots are biocompatible.

The dots' fluorescence intensity peaked at 25°C and then decreased when the temperature rose to 45°C. The dots lost 95% of their fluorescence intensity within

a temperature change of 20°C, indicating their suitability for detecting minute temperature variation inside cells.

The quantum dots also retained their fluorescence intensity up to fifth cycle of temperature-variation experiments.



"Since the quantum dots emit red light, this property could potentially be exploited to make light-emitting diodes from a natural source like mango leaves. Such diodes can function as temperature sensors," says lead author, Mr. Mukesh Kumar Kumawat.

### References

1. Kumawat, M. K. et al. Graphene quantum dots from *Mangifera indica*: application in near-infrared bioimaging and intracellular nanothermometry. *ACS. Sustainable. Chem. Eng.* 5, 1382-1391 (2017)

*This article appeared in Nature-India. For more details visit: <http://www.natureasia.com/en/nindia/article/10.1038/nindia.2017.40>*

## International Women's Day Celebrations

The Women Cell of IIT Bombay celebrated International Women's Day on March 8, 2017 at the Institute. Prof. Devang V. Khakhar, Director, IIT Bombay was the chief guest for the occasion.

"*Why can't I?*" was the theme of the event. The Women Cell had invited two students Aditi Laddha and Palak Jain. They have achieved AIR 6 and 26 respectively. Upon completing their B. Tech., they will join Uber and Google. In addition, Prof. Preeti Rao, an alumna of IIT Bombay and currently a Professor in the Electrical Engineering department, spoke of her journey from being the sole woman student to an academic and entrepreneur whose company SensiBol designs apps based on her research in Music Information Retrieval and Speech Processing Technology.

Young girls from the campus school were special invitees to this event. The event also included a cultural program by students and staff and an energetic Zumba performance by women residents of the campus.



*Prof. Devang V. Khakhar, Director, IIT Bombay during the Women's Day celebration in the Institute*



## Open Learning Initiative, OLI Crosses The 10,000 Landmark Point Within A Year



IIT Bombay's regional educational video channel gets 10,000 subscribers

Open Learning Initiative (OLI), an initiative by the students of National Service Scheme (NSS) of the Indian Institute of Technology Bombay, has crossed the 10,000 landmark subscriptions point within a year. OLI is a YouTube channel hosting Science and Maths videos in regional languages and it caters to students studying in vernacular medium schools. Launched in May 2015, OLI aims to make quality education available to students across India, irrespective of a language barrier.

Crossing the 10,000 subscribers mark within a year is laudable because it reflects a 4000% growth. The channel currently features more than 170 educational videos in 8 regional languages (Hindi, Marathi, Gujarati, Telugu, Tamil, Malayalam, Bengali and Oriya). Yash Sanghvi, founder of OLI said, "My happiness is soaring past the rooftop. No one had expected this kind of growth".

The seed of the fruit was laid when Sanghvi was coordinating with NGO Vidya two years ago. The NGO expressed a need for regional language educational videos for their audio visual module. Since students failed to find suitable videos on the internet, NSS decided to start its own channel. "We wanted to help as many students as possible," he added.

A fourth year UG student in the Mechanical Engineering department, Sanghvi currently serves as the Overall Coordinator of NSS IIT Bombay and has been leading the OLI team. Many schools in rural areas are now using this channel daily to teach students.

Sunil B, one of the coordinators of OLI recalls, "One day, the Web Learning coordinator of the Giridih district, a naxal-affected district in Jharkhand, commented on our channel. She told us how the videos are helping them educate students in the absence of permanent teachers in remote areas of Jharkhand. We were simply overwhelmed. The number of students benefiting from OLI in each class ranges from 40 to 100."

Sanghvi attributes OLI's growth to three factors: Quality, Regularity and Viewer-Interaction. "We followed very strict quality protocols. Each video was reviewed for the clarity of voice, organization of content and overall

aesthetics. We also checked whether a particular video is going beyond the textbook and giving extra insights into the topic or not. Most of the videos uploaded on the channel have been approved only after 2-3 iterations," he said.

OLI uploads at least 2 videos every week and runs special programs like December Bonanza. Viewer-interaction in the form of comments, answering their queries, creating videos based on their demands, has also been an important factor in building the 10,000-strong community. Interacting with the audience builds trust and adds credibility to the channel, believes the OLI team. Elaborating on the December Bonanza, Guru Vamsi, another coordinator for OLI said, "December Bonanza is a challenge for the team. We upload one video everyday throughout December. Also, we try to launch a new language".

Archit Sanadhya, one of the heads of the Educational Outreach Department of NSS IITB, under which OLI falls, feels that OLI has benefitted a lot through word-of-mouth publicity. "We haven't spent a single rupee on advertising. People discovered our channel when they were searching for educational content in regional languages. When they found the content to be good, they spread the word. That's how the channel grew."

There is also a section on scientific experiments and a section on English, because training students in English is a key objective. The OLI team envisions to cover all the regional languages of India and also cover other subjects apart from Science and Maths in the future. More people of India will surely benefit as OLI expands its outreach and increases the number of videos on the channel.

## Research Scholars Confluence and Alumni meet (ReSConAm) 2017



Research Scholars Confluence and Alumni Meet (ReSConAm 17) meet at IIT Bombay

Research Scholars Confluence and Alumni Meet (ReSConAm 17) was conducted by the Indian Institute of Technology Bombay on March 18 and 19, 2017. This global confluence and exhibition provided researchers, researchpreneurs, scientists, startups, alumni and industrialists an opportunity to interact, present and exchange scientific research and ideas. Coordinators Mr. Nikhil Jain and Mr. Pankaj Sharma along with their team planned the confluence leaving no stone unturned to bring together the research fraternity under one roof.

Events included paper presentation, poster presentation, design exhibition and alumnus talks. There were sessions on scientific research communication, research tools, startup pitch, 3 minute talk and a guest talk by Lt. Colonel Ashish Dogra on "Obstacles and solutions for improving the country's internal security systems".

This year, the involvement of IDC and SOM departments increased with design exhibition and session on "Changing dynamics of marketing". The participants from within and outside IIT Bombay got a

chance to interact many influential alumni such as Mr. Anshuman Verma, Founder and Managing Director of M1L and Dr. Vikas Karade, Fouders of AlgoSurg. The students also attended workshops on "mind mapping and innovation" by Mr. Dharmendra Rai, Mumbai's first mind map trainer and on "research to entrepreneurship" by Mr. Puneet Raman, Founder and Director of Prowisdom Growth.

The event also provided an excellent opportunity to competing start-ups to win prizes worth upto Rs 10 lakhs from various investors such as Mr. Navnit J Krishna, founder of iYantras and Mr. Abhijeet Kumar, Founder of ah! Ventures.

ReSConAm was a new and refreshing turn from the regular scientific conferences. It provided the scientific and research community an opportunity to step out of their comfort zones into the world of entrepreneurship to break the ice between the two fraternities. Students and researchers from IIT Gandhinagar, IIT Madras, IIT BHU and other institutes participated.



## IIT Bombay Stands Second in 'Engineering' category in NIRF



IIT Bombay has secured third position in 'Overall' category with a score of 71.78 and second position in 'Engineering' category with score of 87.87 of the National Institutional Ranking Framework (NIRF), which was initiated by the Ministry of Human Resource Development, Government of India last year.

Last year, all the IITs had participated only in the Engineering category. The remaining three categories were Pharmacy, Management and University. This year, there were six categories, namely Overall, Engineering, Universities, Colleges, Pharmacy and Management. Out of six categories, IIT Bombay had participated in 'Overall' and 'Engineering' categories.

The results were announced by the Minister of Human Resource Development Mr. Prakash Javadekar during a press conference in Delhi on March 3, 2017.

## Contrasting Influences Of Aerosols On Cloud Properties During Deficient And Abundant Monsoon Years

The Indian monsoon is influenced by many complex factors, from large-scale atmospheric motion to local and regional physical processes. While large-scale processes have been traditionally well studied, the role of local processes, especially those related to aerosols, or the mix of atmospheric pollution particles and dust, have been largely overlooked. A study carried out at the Interdisciplinary Programme in Climate Studies at IIT Bombay found that atmospheric aerosols WERE present over the monsoon region altered cloud properties in diametrically opposite ways during years of deficient and abundant rainfall. The research, which appeared on 24 March 2017 in the journal *Scientific Reports of the Nature Publishing Group (NPG)*, was carried out by PhD students Mr. Nitin Patil and Mr. Prashant Dave and Prof. Chandra Venkataraman.

Using a 10 year dataset, from 2000-2009, of satellite and ground-based observations of aerosol abundance and cloud properties, over the core monsoon region of India, the study found that in deficient rainfall years, higher levels of atmospheric aerosols correlated with smaller cloud drop sizes, shallower cloud heights and less cloud-ice formation. In contrast, in abundant rainfall years, higher levels of aerosols correlated with larger cloud drop sizes, taller clouds and greater cloud-ice formation.

Deficient rainfall years typically have lower moisture availability, less upward wind motion or convection, along with lower cloud fractions or cloud coverage. The changes in cloud properties found in these years with increased aerosol levels, could further inhibit cloud development and subsequent rainfall. However, when overall higher vertical wind and moisture transport, in abundant rainfall years, coincided with increased aerosol levels, the changes observed in cloud properties could intensify rainfall. In describing the work, Prof. Chandra Venkataraman said, "The question we asked was whether aerosols affect clouds in *similar* or *dissimilar* ways, under broadly different meteorological fields, which occur in deficient and abundant monsoon years. The opposing influences found here confirm that local physical processes exert important effects."

Observations of monsoon trends in the last 50 years show decreases in frequency of moderate and low rainfall but increases in frequency of higher intensity rainfall. More work is needed to link relationships observed in this study to consequent changes in rainfall development. "Understanding aerosol-cloud-rainfall interactions could help improve the physics of climate models for future climate prediction," added Prof. Venkataraman.

## Team Of IIT Bombay Wins ASME SDC-2017

Team ASME of IIT Bombay - Innovation Cell has won all the events of ASME Student Design Competition (SDC) with a huge margin along with Advance Manufacturing Challenge and Predictive Design & Simulation Challenge, beating all the teams across Asia Pacific region.

ASME floats different problem statement for SDC every year. The 2017 SDC problem statement was to create a robot that is fast, strong, and agile. Team ASME of IIT Bombay built a remotely controlled device to compete against others in the robot pentathlon consisting of Sprint, Lift, Hit, Throw and Climbing.

The team has won a cash prize of USD 500 along with travel sponsorship for participating in international level in USA. The team is mentored by Prof. Abhishek Gupta, Department of Mechanical Engineering. This is one of the student technical projects (STP) supported by IITB/IRCC under the STP initiative.



ASME Team

## IIT Bombay Designs Swarachakra Keyboard To Make Chatting Easier



Swarachakra, a free Indian language keyboard for Android phones

India has about 340 million smartphone users. Research indicates the number of users typing in Indian languages on smartphones is more than the number of users typing in Indian languages on personal computers, because typing in Indian languages on personal computers is mostly done by professionals.

Many homes in India now also have more than one smartphone today. While chatting on Whatsapp, Facebook messenger, Hike, Viber and others, the user sees the chat on only half of the screen, while the other half is covered by the keyboard, especially in case of use of Indian language due to the script.

Under the main project titled 'Re-shaping the Expected Future' initiated by Future Interaction Technology Lab in Swansea University, UK and funded by EPSRC, the 'Better Together' framework was developed. This framework allows users to run an application on multiple phones at the same time while providing the overall interaction of a single application.

Under the 'Better Together' framework, the Industrial Design Centre in IIT Bombay has designed Swarachakra, a free Indian language keyboard for Android phones. Currently, Swarachakra is available for twelve Indian languages on Android playstore. Swarachakra is now integrated with Better Together. This allows users to type on one phone using the Swarachakra keyboard and see the conversation on the second phone.

The Better Together toolkit and Swarachakra keyboard was launched recently at the Microsoft Research in Bangalore. The project is supported by a range of partners including IIT Bombay, Microsoft Research India, IBM Research India, iHub Research, Microsoft Research UK, MercyCorps, Social Impact Lab and University of Cape Town.



## IITB And Gondwana University-Gadchiroli Collaboration For Diploma In Bamboo Craft

A four weeks orientation cum exposure training to the resource staff from Science and Technology Resource Centre (STRC) was conducted at BambU studio of Industrial Design Centre, IIT Bombay in March 2017. The training was a capacity building activity for the programme coordinators (resource staff) for the proposed 1 year diploma course in bamboo craft envisaged at STRC, Gondwana University, Gadchiroli (GUG).

*STRC has been formed at GUG by the support from Rajiv Gandhi Science and Technology commission (RGSTC). STRC is mandated to help in local area development through the GUG. GUG would offer diploma and degree courses for various training programs for artisans via the STRC.*



*Dr. Prakash M. Dolas, Advisor, RGSTC and Mr. Ashis Gharai (CPO, STRC - GUG) with Prof. A.G.Rao and Prof. R.Sandesh, Industrial Design Centre, IIT Bombay (Project Investigator) in BambU studio, IDC*



*Mr. Kantilal Gajbhiye and Dr. Prashant Bharne (Resource staff, STRC-GUG) during the training session*

*IIT Bombay has been identified as the primary mentoring institution for STRC. IIT Bombay will specifically help in establishing applicable R&D ambience inclusive of incubation, innovation and suitably tailored academic programs with vocational slant. BambU Studio (IDC) and CTARA are the two participating entities of IIT Bombay having vast experience of the kind required for establishing such a centre.*

## Institute Valedictory Function



(L-R) Prof. Soumyo Mukherjee, Dean (Student Affairs), Prof. Devang Khakhar, Director, IIT Bombay, Prof. Viral Acharya, Deputy Governor, Reserve Bank of India, Chief Guest and Prof. Ravi Sinha, Dean (Alumni & Corporate Relations), IIT Bombay during the Valedictory Function

The Institute Valedictory Function was held on April 26, 2017. The last event in the life of any graduating student in IIT Bombay, it was indeed a time of mixed emotions for everyone. Prof. Viral Acharya, Deputy Governor, Reserve Bank of India was the chief guest. World-renowned economist, Prof. Acharya has completed B.Tech from IIT Bombay (1991-1995) and he is also President of India Gold Medallist for highest GPA and for best academic & overall proficiency at IIT Bombay. He is also the recipient of Young Alumnus Achiever Award from the Institute.

Prof. Devang Khakhar, Director, IIT Bombay, Prof. Soumyo Mukherjee, Dean (Student Affairs), and Prof. Ravi Sinha, Dean (Alumni & Corporate Relations), were also among the dignitaries. The program was introduced by Prof. Soumyo Mukherjee who congratulated the students for completing the tough journey of graduation. Prof. Devang Khakhar and Prof. Ravi Sinha also addressed the audience during the event.



The respective representatives also shared memories of their Institute life. Mr. Sarthak Jain, under graduate representative, gave a heartfelt graduating speech. Ms. Abhisha, M.Tech representative, also shared her experiences at IIT Bombay. Ms. Nanditha Rao, PhD representative, threw light upon the life and journey of PhD students in the Institute.

The chief guest, Prof. Viral Acharya, also spoke to the audience in the valedictory address, telling them about



the pointers which he considered important in his life. He emphasized the importance of being ready for unexpected opportunities. He quoted various examples from life and stressed on how one should always think of innovating and improving oneself. He also shared some of his life experiences in his inspiring speech.

The gathering was also addressed by Ms. Damayanti Bhattacharya, CEO, IITB Alumni Association. She threw light on the activities of the Alumni Association. The proceedings also included the ceremonial transfer of the student list from Prof. Soumyo Mukherjee to the alumni list with Prof. Ravi Sinha.

The Outstanding Contribution Awards were also given to felicitate members of the student alumni relations cell who have contributed substantially to the Institute as members of Dean (Alumni and Corporate Relations) Office. The list of awardees is as follows:

Ajinkya Patil  
Saurav Mishra  
Harsh Patel  
Prasoon Kumar  
Shreeneet Rathi

The valedictory function thus ended with the last adieu to the graduating batch of 2017. A total of 2364 students are likely to graduate this year out of which 629 are B.Tech students and 365 PhD and the rest from the different post graduate disciplines. This is most likely to be the highest number of graduating students at a time over the years.



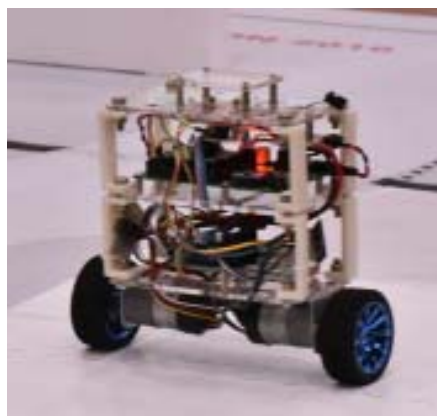
## Student News



*e-Yantra Robotics Competition*

March and April are high points in the year for the burgeoning community of 250 e-Yantra Robotics Labs throughout the country – set up by the e-Yantra project at IIT Bombay. On March 24-25, 2017, IIT Bombay hosted some 150 finalists from over 22,608 students from across the country to compete in the finals of the e-Yantra National Robotics Competition. What makes this competition special is its democratic nature where even a resource-poor student from a small town can compete on a level-playing field with students from rich metropolitan colleges. A team of 4 students from a remote West Bengal Polytechnic – diploma holders – came to the finals last year at IIT Bombay and won first prize in their theme against students from more affluent colleges. Similarly, a group of 4 girls from Mepco Schlenk Engineering College in Sivakasi, who had never travelled out of their hometown, came to IIT Bombay with a teacher and won third prize in their theme. A robotics revolution is in the making where e-Yantra, an

## e-Yantra Robotics Competition and Symposium– eYRC



IIT Bombay based project led by Prof. Kavi Arya in Computer Science Engineering Department is making waves by enabling talented engineering students stand up and be counted.

A total of 35 teams (150 students) across 7 themes from eYRC-2016 were selected for the finals at IIT Bombay. The prize is a coveted 6-week “transformational” internship at IIT Bombay in summer. The competition has grown

exponentially in popularity from 4500 registrations in 2012 to some 22608 last year in the latest edition.

On April 7-8, 2017, the e-Yantra Symposium was organized, where some 200 teachers from 100 newly minted e-Yantra labs and some 100 student finalists of the e-Yantra Ideas Competition came to IIT Bombay to attend a program comprising inspiring talks and workshops and the finals of the e-Yantra Ideas Competition. The talks were from leaders in Indian Industry such as Dr. Anand Deshpande (CMD, Persistent Systems Ltd.) and Mr. Ashank Desai (Chairman, Mastek Ltd.) amongst others. The audience was enraptured by a talk by Mr. Somya Sarkar, Deputy Director, Sensors Development Area Space Applications Centre, ISRO responsible for the payload of the Mangalyan Mission. He described how ISRO manages high-quality, high impact at low cost. Prof. K. Ramasubramanian, Department of Humanities and Social Sciences, IIT Bombay described Indian traditions of excellence in basic sciences and engineering. He illustrated this with references to original sources showing us how “Pythagoras Theorem” originated in India much before it was “discovered” in the West. Nobody said this before.

An exhibition of the finalists of the e-Yantra Ideas Competition was also held. This competition is open to the community of e-Yantra labs where each lab submits upto 4 project proposals for machines to solve a problem in society. Some 300 proposals were reduced to 150 and proposers were invited to build their systems using e-Yantra lab facilities. Videos of working prototypes were uploaded and regional finalists were identified. Regional finals were held in Coimbatore, Bangalore, Delhi, Pune and Mumbai. Finalists were brought to exhibit in Mumbai. It had an ingenious window-cleaning robot, and also a machine that does away with the need for plastic money using fingerprints as ID proof and a paper-bag making machine, to name a few. All these projects were conceptualized and implemented in the space of 6 short weeks.

There was a display of mass empowerment of engineering college students through a competition-based paradigm using robotics. The competition empowers students with the ability to solve problems using machines - through project-based learning pedagogy developed at IIT Bombay. These skills are taken to the next level by the e-Yantra Ideas competition available to the community of e-Yantra labs. Here, students turn problems into opportunities by building machines to address these problems. These are but baby steps along the path of innovation and entrepreneurship. It can be said that e-Yantra is helping make the resource that will “Make in India” while the project itself is “Made in IIT Bombay!”

Institute Colloquium /  
Lectures



**Justice Gautam Shirish Patel**, Bombay High Court, delivered the fifth lecture of the 'Institute Lecture Series on the Indian Constitution' titled "*Technology and the Constitution: Emerging Challenges*" on March 25, 2017



**Mr. Utkarsh Patange**, Alphagrep Securities, Mumbai, delivered an Institute lecture on "*Joint Seat Allocation 2015 And 2016: Challenges And Impact*" on April 12, 2017



**Dr. Viral Acharya**, Deputy Governor, Reserve Bank of India delivered an Institute lecture on "*Banks, Markets and Financial Stability*" on April 8, 2017



## Other Lectures

**Dr. Mark Fox**, Distinguished Professor of Urban Systems Engineering, Professor of Industrial Engineering and Computer Science, and Director of the Centre for Social Services Engineering at the University of Toronto gave a talk on “*University Of Toronto’s New School Of Cities*” on March 1, 2017

**Dr. Bernhard Lechner**, a Distinguished Professor of Chair and Institute for Road, Railway and Airfield Construction at the Technical University Munich gave a Science Lecture on “*Making the Infrastructure Work – Public Transportation*” on April 8, 2017. The lecture was arranged by the Office of Dean (International Relations) along with DAAD (German Academic Exchange Service)

## Departmental Lectures

### Department of Computer Science and Engineering

**Ms. Poornima Dore**, Thematic Lead, Data Driven Governance, Tata Trusts gave a talk in a seminar on “*Data Driven Governance: The Intricate Art Of Developing Scientific Solutions*” on March 27, 2017

### Department of Humanities and Social Sciences

**Prof. Charles Willemen**, Rector, International Buddhist College, Songkhla, Thailand gave a talk in a seminar on “*Is Sri Lanka Theravada Buddhism Really The Traditional Sangha?*” on March 15, 2017

**Mr. Kusminder Chahal**, Visiting Research Fellow at Arizona State University, USA, gave a talk in a seminar on “*Is Caste-Based Violence A Form Of Hate Crime?*” on March 15, 2017

**Dr. M.P.Singh**, a Member Secretary, of the Indian Council of

Philosophical Research, Delhi gave a talk on “*Kantian Jurisprudence*” on March 16, 2017

**Sameera Iyengar**, co-founder of Junoon, an organisation that aims to make theatre/arts an integral and powerful part of our everyday lives gave a talk on “*Seeking An Arts-Inspired World: Reimagining Community*” on March 17, 2017

**Dr. Nitin Williams**, currently funded by the flagship Human Brain Project (HBP), on a post-doctoral project to infer the brain-wide pattern of functional interactions in the human brain, being done in University of Helsinki, Finland gave a talk in a seminar on “*A Matter Of Time: Analysing Time-Varying Functional Brain Networks In Eeg Task-Related Data*” on March 23, 2017

**Prof. Ravi Vasudevan**, Centre for the Study of Developing Societies (CSDS, New Delhi) gave a talk in a seminar on “*The Film/Media Archives And Political Imaginaries*” on April 5, 2017

**Dr. Varsha Singh**, IIT Delhi gave a talk in a seminar on “*Emotion-Cognition And Decision Making: Exploring Gain-Loss Asymmetry In Deception Choice*” on April 5, 2017

**Dr. Amit Ranjan**, Delhi University gave a talk in a seminar on “*Indo-Australian Colonial Connections, Mid-19th Century British Empire, And Struggles With Lives And Times Of Revenants*” on April 6, 2017

**Ms. Rashmi Gupta**, Independent scholar in Cognitive Neuroscientist gave a talk in a seminar on “*Role Of Attention On Our Ability To Ignore Emotional Distracters And Development Of A Diagnostic Classification System For Attention Deficit Hyperactivity Disorder (ADHD) Children*” on April 6, 2017

**Dr. Sumitava Mukherjee**, Independent Scholar in domains of Cognitive Science, Psychology and Management gave a talk in a seminar on “*Prospective Affective Valuation Of Gains And Losses*” on April 7, 2017

**Dr. Apurva Kumar Pandya**, Manager – Grants Implementation with ChildFund International leading the project operations in Udaipur. gave a talk in a seminar titled “*Hiv/Aids Counselling Practices: Experiences And Perspectives Of Counsellors Working with Targeted Interventions in Gujarat*” on April 10, 2017

**Dr. Shiju Sam Varughese**, Centre for Studies in Science, Technology and Innovation Policy (CSSTIP) in the School of Social Sciences of Central University of Gujarat, Gandhinagar gave a talk on “*Biopolitical Transformations Of The Social Contract Of Science: Endosulfan Survivors As ‘Non-Publics’ In Kerala*” on April 10, 2017

**Dr. Mohd Hussain Kunroo**, National Institute of Public Finance and Policy, New Delhi, gave a talk on “*Empirical Testing Of The Various Criteria Of Optimum Currency Area*” on April 11, 2017

**Dr. Aparna Pandey**, Kristu Jayanti College, Bengaluru gave a talk in a seminar on “*Tracking Alpha-Syllabary Reading Through Eye Movements: Some Exploratory Studies*” on April 12, 2017

**Dr Bharatee Bhushan Dash**, National Institute of Public Finance and Policy (NIPFP), New Delhi gave a talk on “*Expenditure Visibility And Voter Memory: A Compositional Approach To The Political Budget Cycle In Indian States, 1959 – 2012*” on April 13, 2017

**Dr. Deva Raj P**, Indian Institute of Technology (IIT-ISM), Dhanbad gave a talk in a seminar on “*Solar Photovoltaic Technology Development In India: A Critical Analysis Of Culture Of Science And Science Policy Making*” on April 19, 2017

**Dr. Mallica Mishra**, consultant at national council of rural institutes (a central government of india organization under MHRD) gave a talk on “*Tibetan Refugees In India: Learning For A Future*” on April 20, 2017

**Dr. Mainak Mazumdar**, NITIE, Mumbai gave a talk titled *"Title: Growth, Regional Disparity and Club Convergence in India: A Sectoral Level Analysis and Decomposition"* on April 21, 2017

**Dr. Antara Chatterjee**, Indian Institute of Science Education and Research), Bhopal, gave a talk on *"Remembering Bangladesh: Narrating the Nation from the Transnational in Tahmima Anam"* on April 28, 2017

**Dr. Bhangya Bhukya**, University of Hyderabad)gave a talk in a seminar on *"British Empire and its Periphery in India"* on April 28, 2017

**Centre for Policy Studies and Department of Humanities and Social Sciences**

**Mr. Subrat Das**, Executive Director, Centre for Budget and Governance Accountability (CBGA), New Delhi gave a talk on *"Development Discourse - IV What do the Numbers Tell : Union Budget 2017-18"*

**Department Of Metallurgical Engineering & Materials Science**

**Prof. Yoke Khin Yap**, Michigan Technological University, USA gave a talk in a seminar on *"Transistors Without Semiconductors By Functionalized Boron Nitride Nanotubes"* on April 3, 2017

**Department of Civil Engineering**

**Mr. Omar Wani**, PhD Researcher, ETH Zurich and Eawag, Switzerland gave a talk on *"Uncertainty Analysis For Environmental Models – An Introduction"* on March 20, 2017

**Mr. Alexandre Wadoux**, PhD Researcher, Wageningen University, The Netherlands, gave a talk on *"Sampling Design Optimization For Spatial Processes"* on March 21, 2017

**Ms. Sanda Dejanic**, Early Stage Researcher, Aquatic Institute, Eawag, Switzerland gave a talk on *"Sampling Algorithms - Purpose, Construction And Performance Measures"* on March 22, 2017

**Ms. Sanda Dejanic**, Early Stage Researcher, Aquatic Institute, Eawag, Switzerland.gave a talk in a seminar on *"Sampling Algorithms - Purpose, Construction And Performance Measures"* on March 22, 2017

**Prof. B. S. Mazumder**, Former Professor, Indian Statistical Institute gave a lecture on *"Two Phase Flow Over Loose Boundary- Experimental And Theoretical Studies"* on March 23, 2017

**Department of Mechanical Engineering**

**Dr. Devendra Sharma**, Scientist, Basic Theory and Simulation Division, Institute for Plasma Research, Bhat, Gandhinagar gave a talk in a seminar on *"Dusty Plasma: An Interesting Medium To Model Dynamics Of Complex Fluids"* on March 22, 2017

**Prof. Subrata Roy**, Department of Mechanical and Aerospace Engineering, University of Florida, Gainesville, gave a talk titled *"Serpentine Geometry Plasma Actuator for Effective Flow Control"* on April 12, 2017

**Centre for Environment Science & Engineering**

**Dr. David Werner**, School of Civil Engineering and Geosciences, Newcastle University, Newcastle upon Tyne, NE1 7RU, UK gave a talk in a seminar on *"Developing A Theoretical Framework For The Use Of Activated Carbon And Biochar In Sediment And Soil Remediation"* on March 20, 2017

**Dr. Upal Ghosh**, Department of Chemical, Biochemical, and Environmental Engineering, University of Maryland Baltimore County, Baltimore, MD, USA gave a talk in a seminar on *"New Advances in Managing Legacy Pollutants in Sediments"* on March 20, 2017

**Centre for Technology Alternative For Rural Areas**

**Dr. Shrikant Jagtap**, US based consulting company Global Climate Technology for Development gave a talk on

*"Technologies for Climate Smart Agriculture"* on April 4, 2017

**Climate Studies**

**Prof. Aromar Revi**, Director, Indian Institute of Human Settlements gave a seminar on *"Key Findings From IPCC'S"* on April 5, 2017

**SJM School Of Management**

**Prof. H. Raghav Rao**, AT&T Distinguished Chair in Infrastructure Assurance and Security Department of Information Systems and Cyber Security, University of Texas at San Antonio gave a talk in a seminar on *"Phishing Email Classification Mechanisms Using Gain And Loss Framing Cues"* on March 10, 2017

**Invited Talk / Lectures / Visits**

**Prof Chetan Singh Solanki**, Department of Energy Science and Engineering was invited to give TEDx talk on Solar Urja Lamp (SoUL) Program.

The Video of the TEDx talk link is available on :<https://www.youtube.com/watch?v=y1NztnTHoTM&t=398s><<https://www.youtube.com/watch?v=y1NztnTHoTM&t=398s>>

*TED is a media organization which posts talks etc online for free distribution. Under TEDx talks, speakers are invited to talk about great ideas which have lasting impact.*

**Prof. Dharamveer Singh**, Department of Civil Engineering has been the Visiting Research Scholar during May 2013-June 2013 at the University of Oklahoma, Norman, USA

**Prof. U. A. Yajnik**, Department of Physics presented a seminar "Stability, longevity and all that : False vacua and topological defects" at Theoretical Physics Division, Saha Institute for Nuclear Physics, Kolkata March 20 2017



## Awards and Distinctions

### SoUL Project Receives Prime Minister's Award Under Innovation Category



District Collector, Dungarpur receiving award from Hon'ble Prime Mr. Minister Narendra Modi at Vigyan Bhawan in New Delhi

The Solar Urja Lamp Project (led by Prof. Chetan Singh Solanki, Department of Energy Science and Prof. Jayendran Venkateswaran, Industrial Engg. and Operations) as implemented by the District Collector in the district of Dungarpur, Rajasthan received the prestigious Prime Minister's Award (certificate and trophy) under Innovation Category. The award was presented by the Hon'ble Prime Minister Mr. Narendra Modi to the Collector Dungarpur, on the occasion of Civil Services Day 2017 held in New Delhi on April 20-21, 2017.

### National Geoscience Awards – 2016



Prof. Santanu Banerjee, Department of Earth Science, receiving the National Geoscience Award-2016 at the award ceremony in New Delhi

Prof. Santanu Banerjee, Department of Earth Sciences has been conferred National Geoscience Awards 2016 by the Hon'ble President of India Mr. Pranab Mukherjee in the presence of the Minister of State (Independent Charge) of Power, Coal, New & Renewable Energy and Mines Mr. Piyush Goyal on April 12, 2016 at New Delhi

**Prof. Nina Sabnani**, Industrial Design Centre, won the Rajat Kamal Award for the animation film "HUM CHITRA BANATE HAIN" at National Film Award. It was produced by IDC, IIT Bombay and animated by Mr. Piyush Verma and Mr. Shyam Sunder Chaterjee.

**Prof. Phani Tetali**, Industrial Design Centre, has won the runner up in the nation wide 'Cartoonist Hunt' competition held by the Times of India Group

Two short films/ documentary on proteomics based on the work of **Prof. Sanjeev Srivastava**, Department of Biosciences & Bioengineering have been selected for screening in international film festivals.

Following are the details:

#### INDIA BECKONS

<https://www.youtube.com/watch?v=nc1yW-BKdic>

- Berlin World International Film Festival
- New York International Film Festival
- Equality Festival
- EduDoc: Stories of Edupreneurs
- Festival de Cortometrajes "Jose Francisco Rosado" PACAS
- New York Film Screenings

#### PROTEOMICS: TRANSLATING THE CODE OF LIFE

<https://www.youtube.com/watch?v=m4U9bcnGtg4 feature=youtube>

- International Children's Film Festival (ICFF)
- This documentary is hosted on Human Proteome Organization (HUPO) home page

### Installation of ERP at IIT Bombay

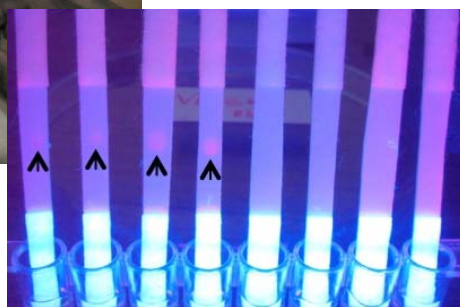
After two years of intense effort from all stakeholders, IIT Bombay has started phased release of ERP on **April 3, 2017**. Initially, only stand alone and low-impact SAP modules have been released. *More details will be published in the next issue of Campus Diary.*

Research in focus

**A Novel Point-Of-Care Detection Device Using Nanotechnology For Diagnosing Periprosthetic Infection Following Orthopedic Surgery**



Lateral flow immunoassay strips showing fluorescence spots and PorFloRTM



Periprosthetic infection becomes a dilemma when the signs and symptoms that commonly coincide are absent, or when infection occurs in the immediate post-operative period when the usual biologic markers such as erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) are still elevated from the surgical procedure. The use of interleukins has become increasingly utilized in the clinical setting, and their use, as prognostic and diagnostic markers in sepsis, trauma, and

critical care have started to expand. The interleukins, specifically interleukin-6 (IL-6), have been shown to be superior indicators of a post-operative inflammatory response due to its return to baseline levels forty eight to seventy two hours postoperatively whereas CRP and ESR levels are typically elevated well above normal for weeks.

Our major objective is to measure levels of IL-6 and CRP from blood / serum / synovial fluid / lavage fluid samples taken from human patients with a periprosthetic joint infection with our novel multiplex quantum dots (QDs) or colloidal gold nanoparticles (CGNs) based lateral flow immunoassay. Development of the fluorescence or colorimetric reader device, and prove our detection ability has improved sensitivity compared to standard ELISA techniques. In proposed work, we are trying to develop the lateral flow immunoassay using QDs and CGNs for diagnosis of orthopedic implant associated infection. We have successfully synthesized the MPA capped CdTe QDs by hydrothermal method and CGNs by salt reduction method. QDs and CGNs were characterized by various techniques. Following the optimization of synthesis process, QDs were bio-functionalized by SPA conjugation on the surface. Conjugation of protein on QDs was characterized by AFM, gel electrophoresis, circular dichroism, TEM analysis and FTIR. The biosensor i.e. IL-6 antibody bound on SPA-QDs and CGNs was developed. This biosensor has been used for the development of LFIA and we have tested IL-6 and CRP concentrations on the nitrocellulose strips.

PorFloRTM - is the name of the device we have developed, it is portable fluorescence LFIA strip reader. It is a small hand held device that records the fluorescence spot and change in fluorescence intensity of the spot on the NCM strip. Detection of fluorescence as well as visual color change on the nitrocellulose strip, calibration and validation of the technique is being done using control, standard, infectious samples. We have started testing our LFIA as well as the reader system for the detection of the standard CRP as well as IL-6 antigens and clinical samples; the results are promising and we are in process of comparing the sensitivity of the developed system with the gold standard techniques such as ELISA.

The detection technique may be extended to detect more biomarkers such as polysaccharide intercellular adhesin (PIA), poly-1,6-N-acetylglucosamine (PNAG), etc. that are involved in process of implant associated infections specifically. This nanodiagnostic technique utilizes unique optical properties of QDs as well as CGNs. The antigenic biomarkers used for detection will provide sensitivity and specificity. This point-of-care (POC) nanodiagnostic test might be very useful for orthopedic surgeons to ensure about infection status of implanted device. We received the prestigious Tata Innovation Fellowship Award from DBT for this translational work on diagnosing orthopedic implant related infections.

**Prof. Rohit Srivastava**

Department of Biosciences and Bioengineering

[http://www.ircc.iitb.ac.in/IRCC-Webpage/rnd/PDF/GlimpseIITBResearch/A\\_NOVEL\\_POINT-OF-CARE\\_DETECTION\\_DEVICE\\_USING\\_NANOTECHNOLOGY\\_FOR\\_DIAGNOSING\\_PERIPROSTHETIC\\_INFECTION\\_FOLLOWING\\_ORTHOPEDIC\\_SURGERY.pdf](http://www.ircc.iitb.ac.in/IRCC-Webpage/rnd/PDF/GlimpseIITBResearch/A_NOVEL_POINT-OF-CARE_DETECTION_DEVICE_USING_NANOTECHNOLOGY_FOR_DIAGNOSING_PERIPROSTHETIC_INFECTION_FOLLOWING_ORTHOPEDIC_SURGERY.pdf)



## Blood Donation Camp



SAMWAD, student team of IIT Bombay and Sthaniya Lokadhikar in association with TATA Memorial Hospital organized a blood donation camp on April 18, 2017 in the Institute. Students, faculty, staff and their families participated in the event. 392 bottles of blood were collected through this drive. Dedicated efforts by Mrs. Neelam Choudankar and her team from Tata Memorial Hospital, along with SAMWAD volunteers and Institute authorities made it a successful drive.

## NOTIFICATION

**Prof Amitava De**, Department of Mechanical Engineering) has been appointed as the Dean Academic Programme w.e.f. March 17, 2017

**Prof. Narayan Rangaraj** has been appointed as the Convener of Industrial Engineering and Operation Research w.e.f. March 29, 2017

**Prof. Ravindra Gudi** has been appointed as the Head, Department of Chemical Engineering w.e.f. March 1, 2017

**Prof. Avijit Chatterjee** has been appointed as the Head, Department of Aerospace Engineering w.e.f. April 3, 2017

**Prof. T. N. Singh** has been appointed as the Head, Department of Earth Science w.e.f. April 3, 2017

**Prof. Subhasis Chaudhuri**, Department of Electrical Engineering has been appointed as the Professor In-charge, IITB-Monash Research Academy w.e.f. April 3, 2017

**Prof Rajesh Zele**, Department of Electrical Engineering has been appointed as Professor In-charge of IIT Bombay Research Park w.e.f. April 11, 2017

**Prof. P. C. Pandey**, Department of Electrical Engineering has been appointed as the Dean (Administrative Affairs) w.e.f. April 17, 2017

**Prof. S. B. Agnihotri**, CTARA has been appointed as the Head of Centre for Policy Studies w.e.f. June 1, 2016

## Appointment

**Prof. M.O. Garg**, Department of Chemical Engineering has been appointed as Professor w.e.f. January 4, 2017.



Retirements on  
March 31, 2017

**Mr. L. S. Mombasawala**, Sr. Research Engineer, C.R.N.T.S retired after 32 years of service



**Mr. Kachru G. Kusher**, Superintendent, Accounts Section retired after 37 years of service



**Ms. Usha Krishnamurthy**, Trained Graduate Teacher (Sr. Scale), Campus School retired after 25 years of service



**Mr. Suresh S. Jadhav**, Sr. Cleaner, Vehicle Section retired after 32 years of service



Retirements on  
April 30, 2017

**Prof. Anil K Singh**, Department of Chemistry retired after 34 years of service



**Ms. Chhaya B. Tatkare**, Jr. Superintendent, Administration, retired after 41 years of service



**Ms. Kiran R. Patwari**, Trained Graduate Teacher (Selection Scale), Campus School retired after 38 years of service



**Mr. Vijay L. Jadhav**, Attendant (SG), HCU, retired after 39 years of service



**Mr. Sanjay D. Dalvi**, Superintendent, Cash Section, retired after 41 years of service



**Mr. Sikander P. Solanki**, Sr. Cleaner, Hospital, retired after 36 years of service





**CEP courses scheduled during May - June - July 2017**

Date	Duration	Course Name	Faculty	Department
<b>Open Programmes : (May - June)</b>				
29-5-2017	12 days	Piping Engineering	Prof. A. S. Moharir	Chemical Engineering
29-5-2017	12 days	Certificate Course on Piping Engineering	Prof. Arun S Moharir	Chemical Engineering
2-6-2017	1 day	Fundamentals of Graph Signal Processing	Prof. Animesh Kumar	Electrical Engineering
5-6-2017	5 days	Biology for Engineers	Prof. Ambarish Kunwar	Bio-Medical Engineering
7-6-2017	2 days	Leadership Development Programme(LDP) on Entrepreneurial Leadership for Transformation	Prof. S. Bhargava	School of Management
8-6-2017	2 days	Best Practices for Service Provider Network Design in India	Prof. Ashwin Gumaste	Computer Science & Engineering
12-6-2017	5 days	Laboratory and Ergonomic Safety for Engineers	Prof. Ambarish Kunwar	Bio-Medical Engineering
19-6-2017	5 days	Introduction to Space Flight Mechanics (Spac eMech_17)	Prof. Ashok Joshi	Aerospace Engineering
19-6-2017	5 days	Advanced Heat Transfer	Prof. Sandip Kumar Sahu	Mechanical Engineering
26-6-2017	5 days	Finite Element Method & Applications in Civil Engineering	Prof. T.I. Eldho Prof. Y.M. Desai	Civil Engineering
27-6-2017	5 days	Proteomics: From Protein Purification to Characterization	Prof. Sanjeeva Srivastava	Bioscience and BioEngineering
28-6-2017	3 days	Research Approaches and Methods In Management and Social Sciences	Prof. Ashish Pandey	School of Management
<b>In House Programmes : (June)</b>				
5-6-2017	3 days	A-Mot Program nn People Management	Prof. Ashish Pandey	School of Management
29-6-2017	3 days	Mahindra & Mahindra : MLU Alchemy Workshop on Industry 4.0	Prof. Makarand S Kulkarni	Mechanical Engineering
<b>Open Programmes : (July)</b>				
1-7-2017	5 months	Analytics for Management	Prof. Usha Ananthakumar	School of Management
3-7-2017	5 days	Advances in Transportation Planning and Traffic Management	Prof. Gopal Patil	Civil Engineering
20-7-2017	2 days	Electrochemical Techniques for Research : Theory and Practicalal	Prof. Vngaranahalli S Raj	Metallurgical Engineering & Materials Science
23-7-2017	7 days	Parallel Computing with GPUS	Prof. Paluri Satya V Nataraj	Systems & Control Engineering
28-7-2017	3 days	Expo CD	Prof. Ravi Poovaiah	Industrial Design Centre
29-7-2017	10 months	XV Batch Of Executive Programme in Management with Specialization in Marketing and HRM	Prof. S. Bhargava	School of Management



In the  
Wilderness

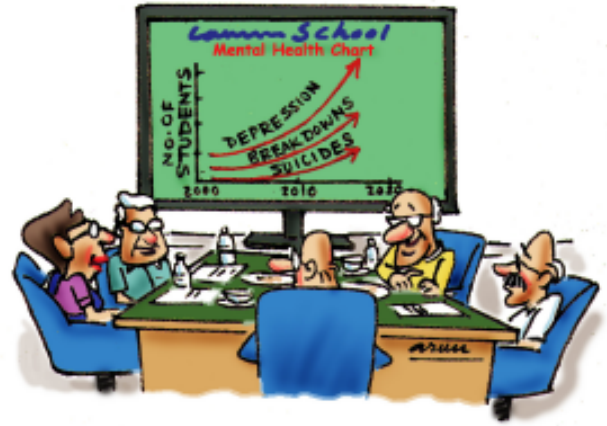


**Photo Credit :**  
**by Mr. Batu S. Kambale**  
Hospital, IIT Bombay

## SALT 'N PEPPER

by Dr. Arun Inamdar

"..As you can see, we've just two options, either deny it vehemently or outsource the management, like we do in all other cases !.."



**For Private Circulation Only.**

Material for publication in Campus Diary  
should reach PPR section by the 25th of  
every month

(email : campusdiary@iitb.ac.in)

BOOK POST

