Prajwalam

The Newsletter Vol-4 Issue-2 (September 2015)

Indian Institute of Technology Ropar

Director's Message

Dear friends,

We are going to a new mode in which the newsletter of IIT Ropar will come in a sleek and focused format more frequently. This is to apprise you of the fast changing scenario at IIT Ropar. The institute is all set to enter the transition phase from childhood to adolescence. In real terms, it means the task of defining its mission and vision through a consultative process among the stakeholders and to frame a strategic plan to achieve them. It has also started the task of defining its research goals and recast its academic programs in a fast changing national and global perspective.

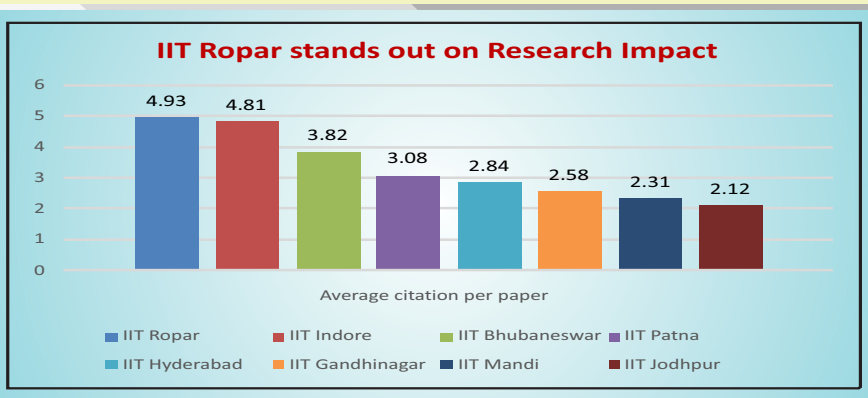
With young and enthusiastic stakeholders, the institute has taken up this task seriously and energetically. The time has come when IIT Ropar defines its goals with respect to contributions to the nation, the local needs and the global challenges in its endeavor to elevate itself to a world class institute. We look forward for support and suggestions from all of you: the students, the faculty, the staff as well as the scientific and technological community, the government and public at large.

I thank the institute's former Director, Prof. M.K. Surappa, for leading IIT Ropar during its difficult years of formation. I am sure with your support and wishes, we will march forward towards excellence and dedicate IIT Ropar to the service of the nation.

Jai Hind

Academic and Administrative Reforms

In the last few months, IIT Ropar has witnessed significant initiatives that aim to strengthen its administrative and academic structure. The institute Director has reframed the central administration of IIT Ropar with the appointment of Deans of Academics; Faculty Affairs and Administration and Sponsored Projects and Consultancy. The Deans' committee is further strengthened by the nominations of Associate Deans of UG; PG; Research; Industrial Relations, International and Alumni Affairs; Student Affairs and Campus Development. It is worth noting that this entire process of restructuring has been done with inputs from faculty members. Further, to meet the challenges posed by continuous evolution in science and technology, the institute has framed a *Curriculum Task Force* with a mandate to design engineering curricula best suited for the 21st century needs. The process of identifying institute research themes and departmental thrust areas has received overwhelming participation from the faculty members. The Director has also initiated an extensive dialogue mechanism with faculty, students and staff with the idea of addressing their concerns effectively. With a robust system in place, IIT Ropar seems to have a spring in its steps.



IIT Ropar Welcomes its New Director

Prof. Sarit K. Das assumed the charge of Director, IIT Ropar on 16th June, 2015. Prof. Das has served as Professor with the Mechanical Engineering Department and Dean (Academic Research) in the past at IIT Madras.

He has published four books and more than 250 research papers. He is a recipient of the DAAD and Alexander von Humboldt Fellowships of Germany. He is a fellow of the Indian National Academy of Engineering and the National Academy of Sciences, India. He has been bestowed with several awards, such as *India Citation Award 2012* by Thomson Reuters. He has also been awarded the *Peabody Visiting Professorship* at the Mechanical Engineering Department, Massachusetts Institute of Technology, Cambridge, USA, in 2011. He is the Editor-in-Chief of the International Journal of Micro/Nanoscale Transport and an Associate Editor of Heat Transfer Engineering journal.

INSA Young Scientist Medal

Dr. Rajesh V. Nair, Assistant Professor, Department of Physics has been selected by Indian National Academy (INSA) to receive the Young Scientist medal in Physical Sciences for the year 2015. This medal is given for his outstanding contributions to the experimental development of photonic crystals in India by way of research and publications in high-impact international journals. IIT Ropar is the only new IIT to receive this honour in 2015.

Details of his research activities are available on page 2.

IIT Ropar Research Makes a Mark

IIT Ropar is leading in research impact among newer IITs. As per the latest Scopus data dated 9-9-2015, an average citation per paper (ACPP) of IIT Ropar is 4.93 with an h-index of 23. With approximately 100 publications annually alongwith impressive citations, IIT Ropar has indeed come a long way in establishing its research credentials.

IIT Ropar and PGIMER Make Strides in Plastic Surgery

Dr. Prabir Sarkar and Dr. S. S. Padhee of the School of Mechanical, Materials and Energy Engineering, IIT Ropar alongwith Dr. Sunil Gaba of the Post Graduate Institute of Medical Education and Research, Chandigarh have developed an improved cutter for plastic surgery. This is a special cutter with a surgical knife, which is meant to be used for bone grafting. During this kind of surgery, a very small piece of a bone from ribs is being removed and used as a replacement bone for critical bones such as nose bone. Removing such a small piece from rib was a challenge. The space between two ribs is very small and the ribs themselves are of small diameter. Normal scalpels cannot work in such as small space. This limitation is being eliminated by developing a bent scalpel. Additionally, while cutting, often it is difficult to maintain equal depth consistently throughout the cut. The new device has a long extension as a guide that allows maintaining equal depth of cut. Research is ongoing for incorporating additional features in this device.

Research Highlights

1. Our research work in the area of mathematical ecology has received international acclaim. Notably, the research paper titled *Stochasticity and bistability in insect outbreak dynamics*, Theoretical Ecology, 8 (2) has been recommended in F1000Prime as being of special significance in its field.
2. The collaborative research work in the area of Linguistics and Cognitive Science titled *The neurophysiology of language processing shapes the evolution of grammar: evidence from case marking,* PLoS ONE, 10 (8) has received worldwide plaudits, reports the Science Daily.
3. Our research work on nuclear physics titled *Spin Distribution Measurements in 16O+159Tb System: Incomplete Fusion Reaction* has featured in the cover page of Journal of Physics G: Nuclear and Particle Physics, 42 (5).

Awards and Recognition

- **Dr. Rajesh V. Nair** has been awarded the prestigious Indian National Science Academy (INSA) Medal for young scientist in Physical Sciences for the year 2015.
- **Dr. Rohit Y. Sharma** has been elected to the grade of IEEE Senior Member by the Institution of Electrical and Electronics Engineers.
- **Dr. Mukesh Kumar** has received Young Scientist Research Award from Department of Atomic Energy.
- **Dr. Manoranjan Mishra** has received the JSPS Invitation Fellowship for Research by the Japan Society for the Promotion of Science.
- **Dr. Prabir Sarkar** received the Outstanding Researcher award in the category of Engineering / Mechanical for the year 2015 from Centre for Advanced Research and Design, Venus International Foundation.
- **Dr. Ranjan Das** has been awarded as an outstanding reviewer from Energy Conversion and Management journal, Elsevier.
- **Dr. Mukesh Kumar** has been awarded the prestigious Bhaskara Advanced Solar Energy Fellowship by the Indo-US Science and Technology Forum.
- **Somesh Kumar**, PhD student, Department of Electrical Engineering awarded the prestigious CEFIPRA - ESONN Fellowship 2015 by the Indo-French Centre for the Promotion of Advanced Research.
- **Aman Kumar**, B. Tech. student, SMMEE received the Best Paper Award in the National Conference on Emerging Fields in Engineering and Sciences for his paper titled *Validation of Variational Asymptotic Method based solution for bimetallic strip.*

Industry Academia Conclave

The School of Mechanical, Materials and Energy Engineering of IIT Ropar organized its first Industry Academia Conclave (IAC 2015) during May 2015. 35 representatives from different industries including Siemens, Tata Motors, General Electric, Bhabha Atomic Research Centre, Mahindra and Mahindra, National Instruments participated in this conclave. Mr. Dinesh Dua, Vice Chairman, Confederation of Indian Industry (CII), Chandigarh who also acts as CEO and Director, Nectar Lifescience Ltd. inaugurated the conclave. Director, IIT Ropar presiding over the event strongly emphasized on the need for active Industry-Academia partnership. He mentioned that faculties should work in close association with industries on real world problems and must give competitive solutions to industries. Further, he welcomed the inputs from the industrialists in refining the syllabi, as per industry requirements.

Mr. Dua, emphasized on the need to bridge the gap between academia and industry during his inaugural address. He emphasized that industries and academic institutions should play pro-active role in working together on real world problems, so that the young minds could be nurtured as per the specific requirements of the industry. He highlighted that industry-academia collaboration is basically a win-win situation for both industry and academic institutes. He also mentioned about the skill development mapping, a concept proposed by Hon'ble Prime Minister of India, Mr. Narendra Modi, which basically speaks about need-based training to our youth.

Faculties from IIT Ropar and neighboring institutes were also present on the inaugural day session. During IAC 2015, inputs from industrialists with regard to UG and PG curriculum, industrial internship, undergraduate projects, research, consultancy, innovation and entrepreneurship were sought.

Research activities of Dr. Rajesh V. Nair

Dr. Nair is initiating an ambitious research theme in the area of nanophotonics which offers an unprecedented way of controlling light emission and propagation. A state-of-art Nanophotonics laboratory is being set-up at IIT Ropar to investigate light transport and emission in nano-scale photonic structures and meta-materials. The objective here is to study the underlying novel optical processes at a single photon level. His research interests also include development of nano-lasers, disorder-induced light transport, nano-scale wave-guides and optical switches. This has wide applications in lasing, solid-state lighting, sensing, optical communication and quantum information processing.

External Funded Projects

1. *Synthesis of Mono-Cationic and Multi-Cationic Ionic Liquids and Their Application in Catalysis and Material Synthesis* sponsored by Council of Scientific and Industrial Research. **PI: Dr. Rajendra Srivastava**, Department of Chemistry
2. *Quantum dynamics of energy transfer processes in atom-molecular ion interaction* sponsored by Department of Science and Technology. **PI: Dr. T. J. Dhilip Kumar**, Department of Chemistry
3. *Investigations on new nano-composite materials for electrical insulation* sponsored by Central Power Research Institute. **PI: Dr. C. C. Reddy**, Department of Electrical Engineering
4. *Special Manpower Development Programme for Chips to System Design* sponsored by Department of Electronics and Information Technology. **PI: Dr. Rohit Y. Sharma**, Department of Electrical Engineering
5. *Visvesvaraya PhD Scheme for Electronics and IT* sponsored by Department of Electronics and Information Technology. **PI: Dr. Rohit Y. Sharma**, Department of Electrical Engineering
6. *Growth and characterization of 2-D MoS2 monolayers for high sensitivity gas sensor device* sponsored by Department of Atomic Energy. **PI: Dr. Mukesh Kumar**, Department of Physics
7. *Studies on the growth kinetics of earth abundant Cu-Zn-Sn-S solar cell material and enhancing the device efficiency through photon management* sponsored by Department of Science and Technology. **PI: Dr. Mukesh Kumar**, Department of Physics
8. *Finite-size and disorder-induced modification of spontaneous emission in nano photonic structures* sponsored by Department of Science and Technology. **PI: Dr. Rajesh V. Nair**, Department of Physics
9. *DST-FIST Program* sponsored by Department of Science and Technology. **PI: Dr. Harpreet Singh**, School of Mechanical Materials and Energy Engineering

Industrial Consultancy

1. *Tire Engineering / Mechanics* sponsored by Ralson India Ltd., Ludhiana. **PI: Dr. Jitendra Prasad** and **Dr. Anshu Dhar Jayal**, School of Mechanical Materials and Energy Engineering

Design Exhibition

The School of Mechanical, Materials and Energy Engineering conducted Design Exhibition and BTP presentation on April 28, 2015. Students of all branches displayed their products designed in the *Product Design and Realization* courses. Also, final year students of Mechanical Engineering presented their BTP projects during this exhibition. In addition to these, some students of the institute along with workshop staffs and a faculty displayed the largest ballpoint pen and fountain pen in the world. These pens are 23 meters in length.

Workshops

1. *Challenges, Tricks and Tips of Precision Semiconductor Characterization for various Applications* organized by **Dr. Mukesh Kumar** in collaboration with Keithley Instruments on April 21, 2015.
2. One-day workshop on *Intellectual Property Rights* conducted by **Dr. Prabir Sarkar** on March 3, 2015.
3. *Workshop on Sustainability* conducted by **Dr. Prabir Sarkar** at the International Conference on Research in Design 2015, Bangalore on January 7-9, 2015.

Seminars and Invited Lectures

1. *Measurement, Mathematics and Information Technology* by **Prof. M. Ram Murty**, FRSC, FNA, FNASc, Queen's University, Kingston, Canada on May 18, 2015.
2. *Multiband Matching Networks* by **Dr. Shouribrata Chatterjee**, Indian Institute of Technology Delhi on March 16, 2015.
3. *From optical interconnects & multistage interconnection networks to internet of things* by **Dr. Navneet Singh Aulakh**, Central Scientific Instruments Organization, Chandigarh on April 7, 2015.
4. *Total Syntheses of Architecturally Interesting and Biologically Active Alkaloids Sharing All-Carbon Quaternary Stereocenters* by **Dr. Alakesh Bisai**, Indian Institute of Science Education and Research, Bhopal on March 4, 2015.
5. *Charge separation and extraction from colloidally synthesized nanostructures* by **Dr. Sameer Sapra**, Indian Institute of Technology Delhi on June 5, 2015.
6. *All-Metal Aromaticity and Conceptual DFT* by **Prof. Pratim K. Chattaraj**, Indian Institute of Technology Kharagpur on June 29, 2015.
7. *International Robotics: Past, Present and Future* by **Prof. Gurvinder Virk**, University of Gävle and KTH Royal Institute of Technology, Stockholm, Sweden on January 20, 2015.

International Collaborations and Exchange Visits

1. **Dr. Mukesh Kumar** visited the Advanced Center for Photovoltaics, South Dakota State University for three months. His visit was supported by the Indo-US Science and Technology Forum under the Bhaskara Advanced Solar Energy Fellowship.
2. **Dr. Manoranjan Mishra** visited the Tokyo University of Agriculture and Technology for seven weeks. His research stay was supported by the Japan Society for the Promotion of Science.
3. **Dr. Partha Sharathi Dutta** visited the University of Oldenburg, Germany under an Indo-German joint research project funded by the DST and the German Academic Exchange Service (DAAD) for three weeks.
4. **Dr. Pushpendra Pal Singh** was invited at the Facility for Antiproton and Ion Research GmBH, Darmstadt, Germany as a guest researcher to participate in the R&D activities of NuStAR for one month.
5. **Dr. M. Prabhakar** visited the Osaka City University, Japan under DST - JSPC research project for two weeks

Internships Abroad

Name	Place
Aashish Bhardwaj	*California Institute of Technology*, USA under S N Bose Scholars Program
Amogh Agarwal	*University of Ulm,* Germany under DAAD-RISE Summer Internship Program
Arushi Gupta	*University of Toledo*, USA.
Kishan Govind	*Ruhr-Universität Bochum*, Germany
Nekkanti akhil	*University of Duisburg- Essen*, Germany
Abhishek Kalsi	*Chulalongkorn University*, Bangkok
Deepak Bareth	*Mitacs*, Canada

Permanent Campus of IIT Ropar Gathers Pace

Construction work at the permanent campus site is at full swing. IIT Ropar is slated to shift to its permanent campus by May 2017. In phase- I, following facilities are planned to be available at the permanent campus:

Academic
Departments of Chemistry, Computer Science & Engineering, Electrical Engineering, School of Mechanical, Materials & Energy Engineering, Lecture Halls, Administrative Block, Computer Centre, Central Library and Workshops.
Residential
Boys Hostel, Girls Hostel, Dining Hall, T4 Residences (56 Units), T2 Residences (56 Units) and Director's Residence.
Others
Utility Block, School, Health centre and Sports fields.

The construction work at the site is in full swing. Currently, there is a workforce of about 800 workers and engineers engaged in various activities related to IIT Ropar permanent campus project. As of now, the construction of most of the buildings listed above has been brought upto the plinth level. Structural design for most of them is complete and other details are being worked in full swing as per the plan. Tendering process for new/pending items is in progress and is expected to complete within their planned timelines. Another important task that the core team has started working on is chalking out plans for subsequent phases of campus development. This is to ensure that we do not lag behind in planning and other activities when we initiate the construction of subsequent phases of the permanent campus.

In order to ensure that stated target deadlines are met by various agencies that are involved in building the permanent campus, following measures have been put in place by the institute. This includes formation of a core team comprising of Associate Dean Campus Development and an external expert (Mr. S. Ramanujam, former Head, Architecture & Civil Engineering Division, BARC) to monitor and troubleshoot major issues, and assist the director on matters related to permanent campus development project. A Quality Monitoring Committee, comprising of members from the institute and external experts, has been constituted to closely monitor various deliverables for quality.

Student Activities

Inter IIT Tech Meet

In the 3rd Inter IIT Tech meet held at IIT Kharagpur, our students participated in various events. It was a proud moment for IIT Ropar when its team for the business case study competition bagged Silver medal. The team comprising of Akshay Dahiya, Archit Aggarwal, Paras Garg and Swapnil Rai presented their novel analysis and proposed solutions for the problem at hand, which attracted praise and appreciation.

IEEE Student Branch Activities - *Workshop on VLSI Design using FPGA*

The IEEE student branch of IIT Ropar organized a two-day workshop on August 15-16, 2015. The workshop was organized in collaboration with DKOP Labs, New Delhi. It consisted of 5 technical sessions introducing the students to the rudiments of VLSI Design. The inaugural session had *Semiconductor Industry Awareness* session by Mr. H. S. Jatana, Group Director, Semiconductor Lab, ISRO. The workshop was co-ordinated by Dr. Rohit Y. Sharma, IEEE Student Branch Counselor and received enthusiastic participation from UG & PG students of all branches.

New Programmes

From the 2015-16 academic year, IIT Ropar has commenced several postgraduate programmes. The institute is offering M. Tech. programme in Mechanical Engineering and MS –Research programmes in Electrical Engineering and Computer Science and Engineering. Additionally, M.Sc. – MS / PhD Dual degree programmes in Chemistry and Physics and M.Sc. in Mathematics have also been introduced.

हिन्दी कार्यशाला

भारत की राजभाषा, हिन्दी के प्रोत्साहन के लिए भारतीय प्रौद्योगिकी संस्थान रोपड़ ने गत 29 जून 2015 को **''प्रौद्योगिकी और हिन्दी''** विषय पर हिन्दी कार्यशाला का आयोजन किया। इस कार्यशाला में संस्थान के विद्यार्थीयों, कर्मचारियों एंव प्राध्यापकों ने बढ़–चढ़ कर हिस्सा लिया। वैश्वीकरण के इस दौर में हमारी राजभाषा हिन्दी का सरल एंव सार्थक उपयोग कैसे हो यह एक सोचनीय विषय है। विदित है कि भारतीय प्रौद्योगिकी संस्थान की कार्य प्रणाली में हिन्दी का भरपूर उपयोग किया जाता है। इस कार्यशाला के द्वारा प्रतियोगियों ने हिन्दी निबंध प्रतियोगिता में भाग लिया। इस कार्यक्रम में पंजाब यूनिवर्सिटी, चंडीगढ़ के हिंदी विभाग के प्रो0 बैजनाथ प्रसाद मुख्य अतिथि थे।

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