



# Tidings

A biannual newsletter published by the School of Engineering, Indian Institute of Technology Mandi

February 2016

## Chief Patron

**Prof. T.A. Gonsalves**  
(Director, IIT Mandi)

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**Prof. S.Ray**  
**Prof. S.C.Jain**

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## Director's message...

The School of Engineering is a diverse collection of faculty from several different disciplines. Their overarching common goal is to develop and apply novel technologies to the physical world for the benefit of society. Thus, the School has mechanical and civil engineers, materials scientists, even chemists and physicists in its number. Faculty of the School are leading Institute focus areas such as clean energy and mountain infrastructure.

I am pleased that the School of Engineering is publishing its first periodic newsletter. Indeed, this is the first such newsletter from IIT Mandi. This first issue highlights the strengths and achievements of the School. The most important strength is the highly talented and mostly young faculty with an average age of only 35. I am confident that their vigorous activities will make their future newsletters eagerly anticipated reading!

*Prof. T. A. Gonsalves*

## Chairperson's message...

It gives me immense pleasure to introduce the first edition of the biannual newsletter of the School of Engineering beginning this academic year. 'TIDINGS' will highlight the endeavors being made by the School towards the development of curriculum and research in the streams of mechanical, civil and energy engineering at IIT Mandi.

I congratulate the faculty, staff and students for their efforts to achieve excellence and wish them all the best for the future. The School also owes a special gratitude to Prof. S. Ray and Prof. S.C. Jain for their valuable guidance in strengthening the teaching, research and administrative practices. I am sure, the School will have new directions and scale great heights in the times to come.

*Dr. R. Kumar*

## Academic Programmes

- B.TECH.** - Mechanical Engineering
- B.TECH.** - Civil Engineering
- M.TECH.** - Energy Engineering (Materials)
- M.S.** - Mechanical design, Materials,
- &Ph.D.** -Manufacturing, Thermo-Fluids, Structures, Water resources, Geotechnical engineering

## Faculty Strength

<b>Regular:</b>	21
<b>Average Age:</b>	35
<b>Visiting:</b>	2
<b>Mentors:</b>	2

## Publications (as per Scopus)

**Till date:** 92  
**During 2015:** 52

## Research Expertise

### Design:

Computer aided design, Finite element method, Biomechanics, Smart structures, Acoustics & Vibration, Concrete, Landslide

### Thermo-fluids:

Renewable energy, IC engine, Computational fluid dynamics, Multi-phase and Complex fluids, Solar & Thermal radiation, Nano-fluidics, Ground water flow

### Materials:

Solid state refrigeration, Piezoelectric/ Pyroelectric energy harvesting, Glasses & Glass-ceramics, Smart materials, Electron microscopy, Nano-mechanics, Nano-manufacturing, Functional & Thermoelectric materials, Electrochemical biosensors, self-assembly processes, Solar photovoltaic, Energy storage, Energy from waste, Waste heat recovery using thermoelectric materials, Low cost instrumentation, Concrete

## Placements (2014 batch)

### VISITORS

Directi, GridAnts, eClerx, Grofers, Khosla Labs, Amber Group, L&T, Tata Motors, Cognizant, TCS

### OFFERS

65% of the eligible students were placed with more than one offer in average

## Courses organized during 2015

**A short course (27 Oct.-5 Nov.) on Parallel Programming using MPI, openMP and CUDA**

**Organizer:** *Dr. D.V. Patil*

**4-day short term course (13-17 Jul.) on Practical Finite Element Method**

**Organizers:** *Dr. R. Kumar & Dr. V. S. Chauhan*

**1-day workshop (17 Jul.) on the Applications of Smart Materials.** The event included talks by Dr. Jens Twiefel from the Leibniz University, Germany, Prof. B.N. Singh from IIT Kharagpur & Prof. Michael Sinapius from the German Aerospace Centre

**Organizers:** *Dr. R. Kumar & Dr. V. S. Chauhan*

**A 2-day workshop (18-19 Dec.) on Product Design and Innovation** was conducted under the aegis of the Design Innovation Centre, IIT Mandi

**Organizers:** *Dr. O. P. Singh, Dr. A. Dhar & Dr. M. Talha*

Life@  
Mandi



Look! Look! Look deep into nature and you will understand everything (Albert Einstein)

## Projects under progress

### Within the School

Glass-based materials for electrical energy storage applications

**PI: Dr. R. Vaish;** Budget: INR 35.40 lakhs;  
Sponsor: DST; Duration: 5 years

Site specific growth and nano manufacturing of aligned carbon nanotube (CNT) for device applications

**PI: Dr. V. Balakrishnan;** Budget: INR 28.56 lakhs; Sponsor: DST; Duration: 3 years

Photocatalytic transparent glass nano/micro crystal composites for wastewater treatment

**PI: Dr. R. Vaish;** Budget: INR 28.56 lakhs; Sponsor: DST; Duration: 3 years

Arsenic and Heavy Metal Mapping in Water, Coal & Fly-Ash Samples from Urjanchal (Singrauli) area of central India

**PI: Dr. D. P. Shukla;** Budget: INR 22.10 lakhs; Sponsor: DST; Duration: 2.3 years

Electromagnetic radiation response of metals and alloys during deformation at low temperature conditions

**PI: Dr. V. S. Chauhan;** Co-PI: Dr. R. Kumar; Budget: INR 18.40 lakhs; Sponsor: DST; Duration: 3 years

A study on photocatalytic activity in ferroelectric ceramics

**PI: Dr. R. Vaish;** Budget: INR 15.00 lakhs; Sponsor: INSA; Duration: 3 years

Nonlinear analysis of piezo-laminated composite structure

**PI: Dr. R. Kumar;** Budget: INR 3.06 lakhs; Sponsor: DST; Duration: 3 years

## Projects under progress

### In collaboration

Novel routes for nano-crystallization of energetic compounds

**PI: Dr. Prem Felix Siril (SBS, IIT Mandi);** Co-PI: Dr. P. P. Jose (SBS, IIT Mandi),  
Dr. J. K. Randhawa; Budget: INR 68.00 lakhs; Sponsor: ARMREB, DRDO; Duration: 3 years

Design & development of high performance synchronous machine (PMSM) based drives for motion control

**PI: Dr. B. S. Rajpurohit (SCEE, IIT Mandi);** Co-PI: Dr. R. Kumar; Budget: INR 25.00 lakhs; Sponsor: NRB; Duration: 3 years

Modelling of contaminants due to radioactive liquid effluents in Rana Pratap Sagar Lake, Rajasthan

**PI: Dr. R. Ray (SBS, IIT Mandi);** Co-PI: Dr. O. P. Singh; Budget: 22.00 lakhs; Sponsor: BRNS; Duration: 3 years

Development of analytical method to determine transient torques developed under faults and its grid interaction effects on turbine generator shaft system

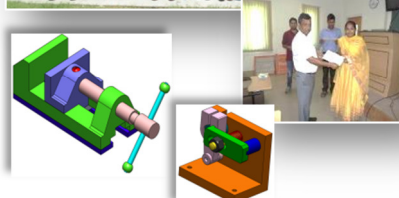
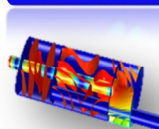
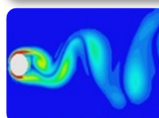
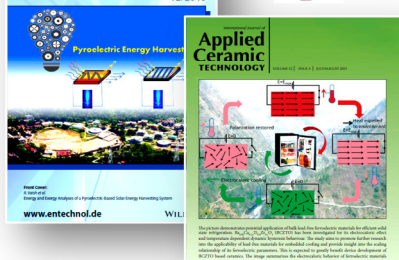
**PI: Dr. R. Kumar;** Co-PI: Dr. B. S. Rajpurohit (SCEE, IIT Mandi); Budget: INR 20.00 lakhs; Sponsor: BHEL Haridwar; Duration: 1.5 years

Web enabled automatic medicine dispenser for the elderly

**PI: Dr. K. K. Patnaik (IIITM Gwalior);** Co-PI: Dr. V. S. Chauhan; Budget: INR 16.69 lakhs; Sponsor: DST; Duration: 2 years

*Tidings* (February 2016)

Energy Technology  
Generation, Conversion, Storage, Distribution  
12/2015



## Distinguished visitors

**Prof. K. Ramamurthi (IIT Madras)** conducted a course on Thermodynamics of Combustion

**Dr. Koushik Vaidya (Applied Materials Inc., USA)** conducted a course on Renewable Energy

**Prof. Anindya Chatterjee (IIT Kanpur)** delivered a lecture on the topic "Nonlinear oscillations and multiscale modelling"

**Dr. Devlina Chatterjee (IIT Kanpur)** delivered a talk on "Linear regression and its assumptions"

**Prof. Quek Ser Tong (NUS, Singapore)** visited campus in the month of September and interacted with the students and faculty members. He also gave a talk on "Identification of faulty sensor using relative partial decomposition via independent component analysis"

## Achievements made by faculty & students

**Mr. Vishrut Shah (M.S. student)** was selected to work at the François Rabelais University/ University of Tours in France under the Charpak Scholarship program

**Mr. Himmat Singh (Ph.D. student)** attended fully sponsored workshops in Russia, Brazil and Switzerland

**Mr. Aditya Chauhan (M.S. student)** was awarded Ramanujan fellowship to pursue Ph.D. in Cambridge University, UK. He was also conferred with the Young Scientist Award-2014 by the Indian Science Congress

**Ms. Monisha Rastogi (M.S. student)** achieved 2<sup>nd</sup> position in the IMPRINT Essay competition

**Dr. A. Dhar** was conferred with the Young Scientist Award at the 7<sup>th</sup> ISEES international workshop on Sustainable Energy, Environment & Safety with railway centric theme organized under the auspices of the International Society for Energy, Environment and Sustainability

**Dr. D. V. Patil** was appointed as a guest editor for the Journal of Computational Science (Elsevier)

IIT Mandi's campus photographs appeared in the cover of international journals: "Energy Technology" and "Applied Ceramic Technology" in appreciation of the research contributions made by **Dr. R. Vaish and his team**

Thanks for reading!! Feel free to contact us for further details