

Michael Faraday IET International Summit (MFIIS-2015)

The Institution of Engineering and Technology, Kolkata Network is going to organize an International Conference, Michael Faraday IET International Summit (MFIIS-2015)

with theme "Power, Control & Automation" in Kolkata during 12-13th September 2015. The International Conference is being planned as a Tribute to Michael Faraday. The event is supported by following IET Technical Professional Networks: IET Control & Automation (UK) and IET Power Electronics, Machines and Drives (UK). All researchers are invited to submit unpublished research paper for this conference. Contributions are invited in the following areas but not limited to following tracks: Track 1: Control Systems Track 2: Drives & Automation; Track 3: Power System; Track 4: Instrumentation & Measurements; Track 5: Power Electronics; Track 6: Energy. Last date of submission of manu-

script is February 28, 2015. Accepted and registered papers will be published in conference proceedings having ISBN and presented papers will be uploaded in IET Digital Library (after post conference review & plagiarism check) which can also be accessed through IEEE Xplore. Hope that the event is going to be a major platform where the scientists, academicians and technologists are expected to meet and discuss the trends and state-of-the-art in the important areas of Power, Control & Automation.

Editorial

Fate of Indian Industrial Research

For rapid sustainable economic development in the post-independence period, policy makers' attention was more and more shifting towards industrialization. Undoubtedly 'Technology' is the key to industrial development. For the same, product may vary according to the nature of raw materials, availability of electrical power, water, climate conditions, labour force, desired quality of product, etc. If indigenously developed, these factors are usually taken care of. If imported, some modifications may need incorporation. Import of technology may take various forms, for example, turnkey, parts of machinery, etc. depending on the technical adoption / absorption capability of the recipient. This part of the transaction between the owner of the technology and its recipient is usually called 'Technology Transfer'.

Because of the obvious economic considerations underlying technology transfer, it has acquired various connotations. These are the consequences of the changes (or in the emphasis) in the industrial and economic policies of the countries involved in the technology transfer and the attitude of owning or receiving those technologies for technology development. Technology transfer policy mostly takes place from developed countries to developing ones. It is rather one way process. However, so far no fixed pattern of technology transfer has emerged!

In India, the relation between Science and Science of Engineering and Technology is rather queer! Before it dawned upon the policy makers to formulate Science Policy (Science Policy Resolution of 1958), India had already established a number of laboratories which were intended to do research relevant to the development of technologies suitable for their transfer to industries. But nothing in this regard found place in the Science Policy Resolution. It was only 25 years later that a technology policy statement was made by the government, but not passed by the parliament. The most important point that was prominently emphasized in the Technology Policy Statement was 'Self Reliance' in Technology Development. In this context we may remember the landable Indian vehicle which led to the manufacture of 'cryo-engines', so essential for 'Space Expedition'.

A new technology policy was formulated in 1993, based on free import of technology, but there was no thought in that policy about the fate of the already established Industrial Research laboratories. Now they have been asked to fund for themselves and find funds for the research they are doing or planning to do with the help of what they can earn by selling their research results in the open market.

Efficient Blue Light Emitting LED invention wins Nobel Prize in Physics (2014)

by K K Bandyopadhyay, IET Kolkata



The Nobel Prize in Physics 2014 has been jointly awarded to two citizens of Japan Isamu Akasaki (b.1929), and Hiroshi Amano (b.1960), along with a Japanese born U.S. citizen Shuji Nakamura (b.1954). Akasaki is currently a distinguished Professor at Nagoya University, and Amano is a Professor of the same University of Japan. On the other hand Nakamura is currently a professor at the University of California, U.S.A.

They have earned Nobel Prize for the invention of efficient blue light emitting diodes (LED s). LED s are being used for more than half a century. They produce radiation by a process known as "electroluminescence" in the visible and in the invisible parts of the spectrum of electromagnetic waves,

except in

the blue end of the said spectrum.

Basically all LED s are made up of several layers of n – type and p – type semiconducting materials. An n – type material contains excess number of electrons that are not bound to any particular atom. This is achieved by adding certain "impurities" to the semiconducting material. A p – type material contain excess number of "holes", that are bound to a particular atom.

According to quantum mechanics these "active" layers exist. When a forward bias is applied, holes from p – type layer and electrons from an n – type layer meet in the active layer. They annihilate each other by recombination and produce "photons" of light in the process. Practically no heat is generated in this process of recombination of holes and electrons. The wave – length photon depends entirely on nature of the semiconducting material.

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The blue light emitting diode consist of several layers of Gallium Nitride GaN (this has a high band gap energy). By mixing GaN with Indium and aluminium these Nobel Prize winning Physicist succeeded in increasing the lamp's efficiency to 300 lumens/watt, compared to 16 lumens /watt for incandescent lamps and 70 lumens/watt for fluorescent lamps. Blue LEDs may be used to excite a phosphor for conversion to white light.

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Book Review

by K K Bandyopadhyay, IET Kolkata

Energy Opportunities & social Responsibility

by Chakraborty Satyes.C. Pub. Jaico Publishing House, Kolkata. Price – Rs 395/- pp-370

Energy is an indispensable resource that is required to run the economy and sustain the well being of people. The rapidly developing economics of third world countries like India and China need to generate increasing amount of energy as they grow. However, the situation has become complicated after discovery of the functional linkages between CO₂ emissions from fossil fuels like coal and petroleum. Hence there is a global search for carbon free energy technology.

Generation of energy is both a technological issue as well as a social commitment. The author has addressed these issues covering all major methods of energy generation. He believes that without social support, the technologists cannot derive effective gains from their discoveries. While dealing with each type of technology for generation, reciprocity between theory and social response has been maintained throughout the book.

The information used in this book has been presented in 30 chapters, each having a specific focus. Those have been grouped into 13 parts to highlight broader themes that define the proximity of the ideas handled in the so grouped chapters.

Those parts are: Energy as seen in science and technology.

Social dimensions of energy use. Polluting coal & Social Impacts.

Petroleum – The Liquid Gold & its Social Impacts.

Water is a Non-polluting Source of Energy. Atoms as Source of Energy.

Direct Energy from the Sun.

Harnessing Energy from the Agitated Atmosphere.

Harnessing Indirect Solar Energy from vegetation.

Energy from the womb of the Earth.

Hydrogen as a Source of Energy and

Where do we go now?

In conclusion, we get puzzled when we see the gap between the ideas nurtured by scientists who do not believe that energy can be produced. They say that one or the other form of energy that otherwise exists in the universe can only be harnessed by us. In contrast, in our ordinary expressions we believe that energy can be produced! A paradox, indeed!!

Sudeshna from Kolkata Network is winner of PATW 2014 Grand Final

Kolkata PATW winner Sudeshna Saha won grand final of Present Around The



World Competition—2014 held in London. Sudeshna is Electrical Engineering final year student of Techno India Salt Lake. She is also an active IET student member. She has already got a job offer from campus interview from a reputed company.

Plant Visit by IET Student Members



On 16th December, Techno India, in collaboration with the Institution of Engineering and Technology(IET) Kolkata YPS Local Network, conducted for students of Electrical engineering, a visit to a transformer manufacturing plant, **Eastern Transformer Equipment Limited**.

The training was scheduled from 1:30 pm to 5:00 pm. It started with the addressing of the students by the director and the manager of the company where a brief knowledge about the construction of transformers was also imparted

to them. This was followed by a visit to the transformer manufacturing factory. Here the various parts of a transformer and the materials needed for their construction were explained and demonstrated in great details. The director and the manager took an earnest and enthusiastic initiative to answer the various inquisitive queries of the trainees regarding transformers. Mr. S Bhowmick, Coordinator of this program from Techno India Informed that all in the whole, it was an enriching experience altogether and a worthy plant visit and Techno India is grateful to IET for its help and support every time and looks forward to more such productive events.

Workshop on Process Instrumentation Technologies in Bhubaneswar

Two days workshop was organized on "PROCESS INSTRUMENTATION TECHNOLOGIES" By KIIT UNIVERSITY jointly with IET KOLKATA NETWORK on 31ST OCTOBER-1ST NOVEMBER, 2014 in Bhubaneswar, Odisha. The workshop was organized with a view to introduce participants on both theory and applications in the broad areas of industrial instrumentation, control and automation. Modern industries are mainly based on automation and control. Fortunately, it has myriad application in Instrumentation, Electronics, Electrical and other engineering fields. Mainly under graduate engineering students and faculties members attended this workshop.

Invited Speakers included experts from industry as well as academic institutions. Prof. Alok Kanti Deb from Department of Electrical Engineering, IIT Kharagpur, delivered lecture on Car Automation. Prof. Rajib Bandyopadhyay from Electronics & Instrumentation Department, Jadavpur University discussed about Artificial Nose & Tongue. Prof. S. K. Mishra, Chief Scientist, CSIR-IMMT, Bhubaneswar covered Process Instrumentation. Prof. Arun Ghosh from Electrical Engineering Department, IIT Bhubaneswar gave vivid explanation about PID Control & its application. Mrs. R. Mahalakshmi, Head of Training Department, Yokogawa India Pvt. Ltd, described distributed control system and interfacing with real world.

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Technotica-2014

Technotica-2014 is an event for technical project exhibition and presentation for engineering students. Like previous years, MCKV Institute of Engineering organized the event in this year also. At initial stage around fifty projects were submitted. From those projects selected projects were exhibited on November 22, 2014 at MCKVIE, Liluah, Howrah. A competition was organized among exhibited projects. Best projects were selected based on the model developed and demonstrated by an expert consisting of senior professors and industry person and awarded.

IET Collaborated International Conference

International Conference on Computing, Communication and Manufacturing (ICCCM-14) was organized by MCKV Institute of Engineering in technical collaboration with IET Kolkata Network at Liluah, Howrah on 22-23 December, 2014. Dr. Subhas Mukhopadhyay from Massey University, New Zealand delivered keynote in the conference. Mr. J K Roy, Mr. Tamal Roy and Mrs Nabamita Banerjee Roy from IET Kolkata Local Network were actively involved in organizing the event. Papers presented in the conference were published in conference proceedings.

Tech News:: LiFi: Data Through Light

by K K Bandyopadhyay, IET Kolkata

Light Fidelity (LiFi) is a technology that uses Light Emitting Diodes (LEDs) to transmit data wirelessly. It was first demonstrated by German physicist Herald Haas, during his talk in 2011.

Its Working Principle: By switching an LED that is filled with a microchip "on" and "off" several thousand times a second, it is able to transmit information. If it is lit it sends a "1-bit", if it is off a "0-bit".

A light-sensitive receiver on the receiving device picks up the signal and converts it back into data.

What are "LiFi"s pulses? A free band that does not need licence. Hence it is cheaper than "Wi-Fi". 10,000 times the visible light wave spectrum is larger than the radio wave spectrum. Communication over a very high speed with theoretical limit of 1GB/sec.

Since optical waves cannot pass through building walls this could be used as a means of secured communication.

Capability of "Li Fi" Technology: It is capable of transferring thousands of streams of data simultaneously parallel at higher speeds, with the help of special modulation, using a unique signal processing technology.

Where "Li Fi" can be used? It can be used where it is difficult to lay optical fibres.

- At traffic signals, it can be used to communicate with LED light of cars, thus controlling traffic congestions.
- In Aircrafts, the overhead light can be used for data transmission.
- In operations threats. [Source The Economic Times, Kolkata, January 14, 2013.]

World's Fastest Fibre Line: Can Transmit 255 Terabits/sec: An international team of researchers has developed the fastest fibre optic line in the world. It can transmit 32 terabytes / sec. (255 terabits / sec). Currently the fastest fibre optic line in the market tops out at 100 gigabits / sec. (12.5 gigabytes per second), which is 2500 times slower than its latest counterpart. It is amazingly quick to transfer the entire contents of 1 TB hard drive in just three tenths of a second. Presently the entire internet consists of single mode optical fibre cables, that can only carry the data from a single laser at a time, whereas, the new cable is a multi-core cable containing seven cores and therefore can transmit seven different signals simultaneously. (source: Science Reporter, Dec, 2014.)

IET Kolkata Newsletter

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