



Michael Faraday -  
the 'Father of Electricity'

*The man who made electricity possible!*

Born: 22-09-1791  
Died: 25-08-1867

A blacksmith's son, Michael Faraday was born on 22 September, 1791, at Newington, Surrey (now Southwark), London.

Faraday began his career as a bookbinder. Later, on 1 March, 1813 he was engaged by the managers of the Royal Institution as a Laboratory Assistant. Faraday's thirst of knowledge and deep interest in 'science' soon found him appointed as an Assistant to Sir Humphry Davy, the noted English Chemist. He toured widely in Europe with Sir Humphry during 1813-1815 and an enlightened Napoleon allowed the visit even though Britain and France were at war. The travels had a tremendous educational impact on Faraday, motivating him to carry out his own researches later.

In 1821, Faraday discovered the principle of electric motor and built a primitive model of one. Two years later he was the first to liquify Chlorine. Convinced of the interrelation of electricity and magnetism, on 29-8-1831 he discovered the phenomenon of electromagnetic induction -- the production of electric current by a change in magnetic intensity: the discovery that revolutionized the world and Faraday came to be known as "the man who made electrical engineering possible..." - a statement made by Sir William Bragg in 1931 on the occasion of the celebration marking the centenary of the discovery of electromagnetic induction. In 1833, Faraday was appointed professor of Chemistry at the Royal Institution.

Among his other accomplishments, Faraday produced the first dynamo, stated the basic laws of Electrolysis, discovered that a magnetic field will rotate the plane of polarisation of light, and discovered, Benzene.

Lord Rutherford, the great English Scientist who split atom towards the beginning of the nineteenth century, wrote about Faraday: "The more we study the work of Faraday with the perspective of time, the more we are impressed by his unrivaled genius as an experimenter and natural philosopher. When we consider the magnitude and extent of his discoveries and their influences on the progress of science and industry, there is no honour too great to pay to the memory of Michael Faraday..."

Of many tributes paid to his memory, the unit of electric capacitance has been named as Farad.

Faraday died on 25 August, 1867, at Hampton Court, Surrey, England.

**Faraday's Laws of Electromagnetic Induction (discovered in 1831) are :**

1. a changing magnetic field induces an electromagnetic force in a conductor;
2. the electromagnetic force is proportional to the rate of change of the field;
3. the direction of the induced electromagnetic force depends on the orientation of the field.

**Faraday's Laws of Electrolysis (discovered in 1832-33) are:**

1. the amount of chemical change during electrolysis is proportional to the charge passing through the liquid;
2. the amount of chemical change produced in a substance by a given amount of electricity is proportional to the electro-chemical equivalent of that substance.



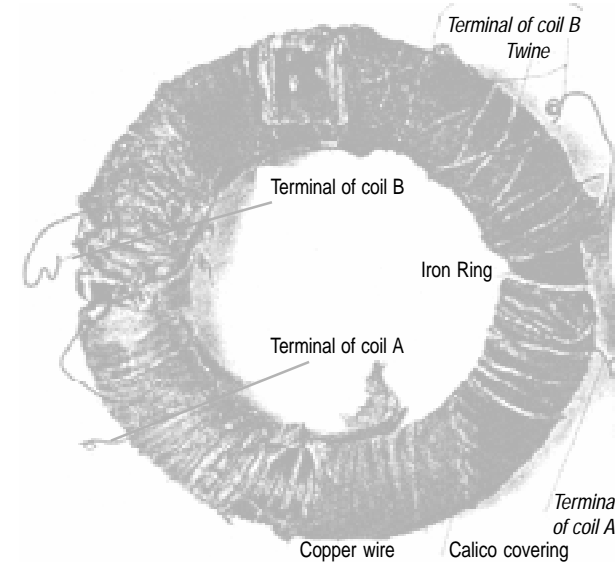
IEEE

**The Institute of Electrical and  
Electronics Engineers, Inc.**

HYDERABAD SECTION, India

and

**B.M. Birla Science Centre,  
Hyderabad**



[The 'RING' used by Faraday to "establish" his laws]

*Commemoration of The Genius!*

**Fourteenth**

**FARADAY MEMORIAL LECTURE**

on Wednesday, 22 September 2004, 6:30 pm

at

B.M. Birla Science Centre

Adarshnagar, Hyderabad 500 063

Today, mankind lives in the world of all kinds of comforts that could not be imagined even a decade ago. These have come about owing to the phenomenal progress of technology. The key to all technological developments has been the phenomenon called electricity.

Generation of this magic element that is electricity is due to the genius of **Michael Faraday**, an English 'Scientist' who invented the fundamental laws of Electromagnetic Induction more than 150 years ago. No wonder the man has always been known as the "Father of Electricity"! The IEEE Hyderabad Section launched the Annual Faraday Memorial Lecture in 1991, the year

of 200th birthday of Michael Faraday, to commemorate his genius, *especially aimed to benefit young students of science and engineering and general public.*

Since then the Section has organised the lecture jointly with Birla Science Centre, Hyderabad held on 22nd September every year. The speakers have been eminent power engineers and scientists, from within India and abroad. Notable among these were Prof. M. Ramamurthy, Prof. Amulya K.N. Reddy, Prof P.V. Indiresan, Dr. K. Kasturirangan, Prof. C.C. Chan, Prof. M. Poloujadoff, Prof. Bimal K. Bose, Dr. Chandra Krishnayya, Prof. Arun G. Phadke and Prof. Keene M. Matsuda.

*You are cordially invited to*

The 2004 Faraday Memorial Lecture

## **MULTIPLE FACETS OF ELECTRICAL ENGINEERING**

by

**Bulusu Lakshmana Deekshatulu**

at

B.M. Birla Science Centre  
Adarshnagar, Hyderabad 500 063

Lecture : 6.30 pm

Tea : 6.00 pm

*(Please be seated by 6.15 pm)*

Information on the Lecture is also available on web page  
<http://www.ewh.ieee.org/r10/hyderabad/faraday.html>

### **The Lecture**

#### **MULTIPLE FACETS OF ELECTRICAL ENGINEERING**

Basic electrical engineering is more conceptual and all pervasive. Normally, what we see in electrical engineering is mostly mechanical engineering and what we are unable to see are the electrical parameters such as voltage, current, flux, etc. The spanning of electrical engineering is multi-

dimensional, into a host of other disciplines from physics to psychology. This is evinced by the phenomenal growth in the Transactions of the IEEE.

After mentioning the growth of electrical engineering tree, this lecture deals with some advances in a few topics such as signal processing, image processing, bionics, computing, etc.

### **The Speaker**



Dr. B.L. Deekshatulu has distinguished himself in the fields of control systems, digital image processing and remote sensing. Prof. Deekshatulu obtained Ph. D. degree from the Indian Institute of Science, Bangalore. He was awarded Martin Foster Medal by I.I.Sc., for Best Ph.D. thesis. He joined as Lecturer in 1964 at I.I.Sc. and became Professor in 1970 and continued in that position till 1976. Dr. Deekshatulu visited USSR during 1968 as a Government of India delegate for setting up School of Automation at I.I.Sc., Bangalore.

Dr. Deekshatulu was a Visiting Scientist at the IBM Watson Research Centre, York Town Heights, New York, and at the Environment Research Institute of Michigan during 1971-72 on Digital Image Processing and Remote Sensing. He designed and fabricated for the first time in India, Grey scale and color Drum Scanners for computer picture processing which won him an NRDC Award.

Dr. Deekshatulu joined the National Remote Sensing Agency, Hyderabad as Head, Technical Division in 1976 and became Director in 1982 – promoted to the grade "Outstanding Scientist" in 1989. He has over 118 research publications to his credit. He has guided 12 Ph.D. scholars and over 50 M.Tech. students. He has visited 27 countries in the world. His current interests are Remote Sensing Data Analysis, Digital Image Processing and Neural Networks.

He is fellow of very many Indian Scientific Academies, Fellow IEEE, Fellow THIRD WORLD ACADEMY OF SCIENCES (ITALY).

He is a recipient of many awards such as the Bharat Ratna Sir M. VISWESWARAYA AWARD for "Outstanding Engineer" in 1984, NRDC Invention Awards in 1986 and in 1993, and Dr. Biren Roy Space Science Award in 1988, "PADAMSRI" medal in 1991, BRAHM PRAKASH MEDAL for significant contributions to Engineering Technology, OM PRAKASH BHASIN AWARD for Science and Technology for 1995, "Sivananda Eminent Citizen Award" from Vice-President of India in 1998. He was Chairman, National Committee on International Geosphere, Biosphere Programme (IGBP) during 1994-97, Chairman of Remote Sensing Applications Missions, India, 1987-96. He was awarded Boon Indrambarya GOLD MEDAL by Thailand Remote Sensing. Awarded 2002 Aryabhata Award by Astronautical Society of India, for life time contributions to Remote Sensing.

Dr. Deekshatulu was a UN / FAO consultant in Beijing during November, 1981. He was the Government representative in the UN/ESCAP/RSSP Directors' meetings and Inter-Governmental Consultative Committee meetings from 1985-95. He was a UN/ESCAP Senior Consultant during September-November, 1996.

He was Director of Centre for Space Science and Technology Education in Asia and the Pacific (CSSTE-AP), affiliated to the United Nations, IIRS Campus, Dehradun, India from November 1995 to April 2002. Currently, Dr. Deekshatulu is a ISRO Visiting Professor in the Dept. of Computer and Information Sciences, University of Hyderabad.