

Event Name: Lecture on Diode to Nanoscale Transistors: An overview

Date (s) of Conduction: 05-02-2024

Name of the Resource Person with Details (if any) : Dr. Satyabrata Jit, Professor (HAG Scale), Dept. of Electronics Engineering
Indian Institute of Technology,
Banaras Hindu University (IIT-BHU), Varanasi-UP

No. of Participants: 160

Organized by: Department of Electronics and Communication Engineering,
BVRIT HYDERABAD College of Engineering for Women.

About the Event: The speaker has started off with historical introduction to the developments that took place before the actual invention of p-n junction diode, vacuum tubes. He has explained the phenomena called rectification prior to p-n junction diode with light as the source.

Dr Jit has illustrated the special properties possessed by semiconductors compared to metals and insulators.

He has explained the Schottky diode that forms between the metal and semiconductor. Then he has covered p-n junction properties and Bipolar Junction Transistor characteristics. He has explained the audience why Junction Field Effect Transistors were designed ahead of BJT but were not available in the market. Next in the line are JFETS and Metal Oxide Semiconductor Field Effect Transistors (MOSFET). He has demonstrated why CMOS is the most dominant technology in the semiconductor era.

Later he has explained MESFET (metal–semiconductor field-effect transistor) is a field-effect transistor semiconductor device similar to a JFET with a Schottky (metal–semiconductor) junction instead of a p–n junction for a gate. He also explained a variation of MOSFET called Metal-insulator-semiconductor field-effect transistors (MISFETs) are a type of field-effect transistor. They are commonly made by oxidizing silicon in a controlled way. He has taken the discussion to most modern TFETs and FinFETs which are helpful for semiconductor industry to satisfy the

Morre's law. The speaker covered Shorted-Gate (SG) and Independent-Gate (IG) transistors which are found applications in specialized areas of electronics.

He has covered nano mater range transistors called CNTFETs that use a single carbon nanotube or an array of nanotubes as the channel material. He explained how CNTFETs are being studied as a potential successor to silicon MOSFETs.

His talk ends with question answer session.

Photos:



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| A Technical Talk on "DIODE TO NANOSCALE TRANSISTORS: AN OVERVIEW" By Dr. Satyabrata Jit Professor (HAG Scale) Dept. of Electronics Engineering Indian Institute of Technology Banaras Hindu University (BHU) Varanasi-UP | |
| 05-02-2024 02.00 PM - 03.00 PM DBSH-4 th Floor | |
| Department of ECE BVRIT HYDERABAD College of Engineering for Women (Autonomous) Bachupally, Hyderabad-90, TS | |

Faculty Co-ordinator

Head of the Department