Report on Guest Lecture, "Technology Migration from Microelectronics to Nanoelectronics"

The lecture started sharp at 9.00 AM in ED Cell by Dr. P. Venkata Ramana, Head of the department addressing the participants about the importance of the event. The participants for the expert lecture were 100 PG students of SVEC. The Resource person Dr P. Chakrabarti, Professor (HAG), Department of Electronics Engineering IIT-BHU Varanasi and former director of MNNIT Allahabad was introduced by Dr. N. Padmaja, Professor, Dept. of ECE.

The resource person took over the first session at 09:10 AM discussing overview, various scenarios and developments which made Nanoelectronics possible. He started the lecture from invention of the vacuum tube technology, introduced how first semiconductor transistor invented by Shockley and Bardeen. He discussed briefly about advancements in microelectronics and discussed IC technology-some ICs available like op-amp etc. He Briefly discussed the functionality of IC and fabrication technology behind it. He demonstrated how photolithography was being used to pattern the complex circuitry on a single substrate. He also focused on the importance of the silicon in IC technology and evolution of microprocessor based cores. He summarized how miniaturization reduces the power consumption and its importance in power reduction. He also introduced the significance of the Moore's law in IC technology. After discussing progress in microelectronics nicely he introduced the definition of the Nanoelectronics. He also nicely differentiated the Microelectronics to Nanoelectronics on the basis of their size and technology involved. He discussed the different fabrication techniques, characterization techniques like Nanophotolithraphy, Nanofabrication technique like MBE, PLD, MOCVD. In characterization session he discussed nicely about scanning electron microscopy (SEM), X-Ray diffraction (XRD).

During the second session after the tea break he discussed how particle size can be calculated from SEM and X-Ray diffraction using brag's law. Finally he focused on Nanotransistor based on different material like graphene, AlGaN/GaN. He also discussed some recently developed silicon based transistors. He also discussed application and significance of the Nanotransitor. In interactive session he interacted with participants and clarify their doubts in the field of Microelectronis and Nanoelectronics. He also suggested the future scope and research avenues availed in this domain.

The snapshots covering various phases of the event are:

Resource Person Dr. P. Chakrabarti being invited to deliver
Guest Lecture by Dr. C. Subhas, Dean (Academics) &
Professor of ECE on behalf of Faculty & Students

Participants listening to the lecture on fabrication steps from the Resource person
Participants listening to advancements in Nanoelectronics domain.

Participants interacting with the resource person inquiring recent research happenings in Nanoelectronics domain.

Dr. P.V. Ramana, Head of ECE Department, Dr. C. Subhas, Dean (Academics), Dr. A. B. Yadav, Convener for the program felicitating the Resource Person

Convener