UGC EXTENSION LECTURES

on

"Nano Technology"

This gives me pleasure to inform you that we are going to organize UGC extension lectures to be delivered by Dr. Prabhat Dwivedi from IIT Kanpur.

TITLE OF THE TALK:

"Towards a Smaller World! Lithography: A tool for Micro- and Nanofabrications "

Venue: School of Studies in Physics

Jiwaji University, Gwalior

Date: October 10, 2015

Time:

Lecture I: 11:00 am to 12:00 Noon

Lecture II: 12:30 Noon to 1:30 pm

Title of the talk: Towards a smaller world! Lithography: A Tool for Micro- and nanofabrication

Abstract: Micro-and nanofabrication techniques have revolutionized nanotechnology research. Application of nanotechnology is very diverse, ranging from electronics, optics, photonics, communication, medicine, sensing, biotechnology and biomaterials, and to clean energy production. This emerging technology is capable of creating many new materials and devices in micro/nano scale with a vast range of above applications. It is well established that many materials with minimum dimensions on the nanoscale have properties different than those observed for their bulk material. The challenges in nanotechnology research are mainly twofold- developing suitable one-step, reproducible and cost effective fabrication processes and further, integration of devices.

Nanofabrication is the process of making functional electronic, photonic, hierarchical or physico-chemical structures with desired patterns having one minimum dimensions in nanoscale. This talk will present the recent developments in micro/nano fabrication techniques. First, part of the talk covers optical lithography techniques used in micro-nano fabrication. These top-down techniques include photo, e-beam and focused ion beam lithography. In the second part of the talk soft lithography techniques will be discussed. Unconventional nanofabrication methods which include both bottom-up and top-down approaches are briefly covered.

Brief Bio-Data of Prabhat Dwivedi:

Prabhat K. Dwivedi is an experimental physicist and working in the micro/nano fabrication research domain from last 10 years. He received his Ph.D. from the ***Harcourt Butler Technological Institute, Kanpur*** in 1996. He has been a visiting researcher at the ***University of Alberta/TR Labs, Edmonton, Canada***, in the photonics group before joining ***Centre for Nanosciences*** at IIT Kanpur in 2006. Currently, he as a Senior Scientific Officer at Centre for Nanosciences, IIT Kanpur, Kanpur. His recent research project includes "Fabrication of 2-D and 3-D Microstructures for Sensor Application Using Gray-scale Maskless Lithography" and "A Solution Based Approach to the Fabrication of Novel Chalcogenide Glass Microlens Arrays for the 6-12 micron IR Optics Application". He has published around 25 peer-reviewed scientific publications in recent five years. His research includes micro-/nano-scale fabrication, microfluidics and miniaturized devices for the energy, environment and biological applications. Currently, he is working on top-down and bottom-up techniques for multi scale capabilities from FIB, e-beam, laser to photolithography together with the development of a variety of self assembly and self-organization based techniques for nano/micro fabrication of large area functional interfaces and devices. Also, he has wide experience in the area of optical materials and process development for various photonic applications.

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