QIP sponsored short term course on

Nanotechnology for electronic & photonic applications

October 3 – October 17, 2012

Venue: Materials Science Centre, IIT, Kharagpur

Organized by
Continuing Education Programme (CEP)
Indian Institute of Technology, Kharagpur

About the Course

Nanotechnology is concerned with materials, structures and systems whose components exhibit novel and significantly modified physical, chemical and biological properties due to their nanoscale sizes. A principal goal of Nanotechnology is to control and exploit these properties in structures and devices. Revolutionary changes in the ability to measure, organize and manipulate matter on the nanoscale are highly beneficial for electronics with its persistent trend of downscaling devices, components and integrated systems.

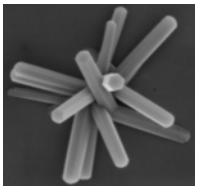
Practical implementations of nanoscience and nanotechnology have great importance and they depend critically on training people in these fields. Thus modern education needs to address the rapidly evolving facets of nanoscience and nanotechnology. A new generation of researchers, technologists and engineers has to be trained in the emerging nanodisciplines. Miniaturization required by electronics & photonics is one of the major driving forces for nanoscience and nanotechnology. The course will provide the basic ideas and understanding on the recent developments in nanoscience and nanotechnology as applied to electronics and photonics. Apart from theoretical lectures there will be laboratory sessions as well.

Course Coordinators

Principal Coordinator: Prof. Pallab Banerji, Associate Professor, Materials Science Centre, IIT, Kharagpur

Co-Coordinator: Prof. S. Ram, Professor & Head, Materials Science Centre, IIT, Kharagpur

Course Content



1. Materials for nanoelectronics

- Semiconductors
- Semiconductor heterostructures
- Organic Semiconductors
- Carbon nanomaterials: nanotubes and fullerenes

2. Growth, fabrication and characterization for nanostructures

- Nanolithography, etching and other means for fabrication
- Techniques for characterization
- Spontaneous formation and ordering of nanostructures
- Clusters and nanocrystals
- Methods of nanotube growth
- Chemical and biological methods for nanoscale fabrication
- Fabrication of nanoelectromechanical systems

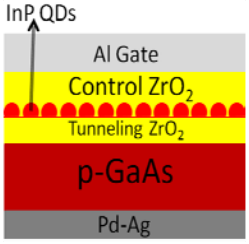
3. Electron transport in nanostructures

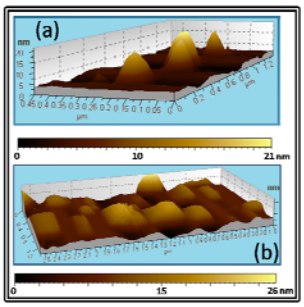
4. Traditional low dimensional structures

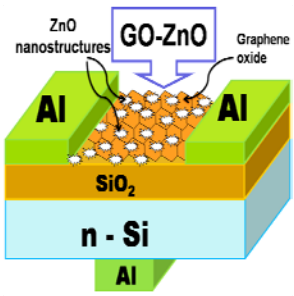
- Quantum Well, Quantum wire and Quantum Dot

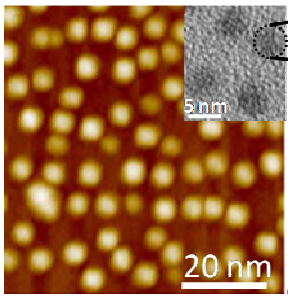
5. Nanostructure Devices

- Resonant tunneling diode
- Field effect transistor
- Single electron transfer device
- Light emitting diode and Lasers
- Nanoelectromechanical system device









Resource Persons

Nanostructures: Synthesis, growth & characterization

Prof. S. Ram, IIT Kharagpur
Prof. R. Mitra, IIT Kharagpur
Prof. D. Bhattacharya, IIT Kharagpur
Prof. C. Jacob, IIT Kharagpur
Prof. S. Bhunia, SINP, Kolkata
Prof. R. Mukherjee, IIT Kharagpur
Prof. A. Chandra, IIT Kharagpur
Prof. S. Basu Majumder, IIT Kharagpur
Prof. D. Pradhan, IIT Kharagpur

Nanoelectronics, photonics, organic devices & other applications

Prof. S.K. Ray, IIT Kharagpur
Prof. A.J. Pal, IACS, Kolkata
Prof. S. Chakraborty, IIT Kharagpur
Prof. C.K. Sarkar, Jadavpur University, Kolkata
Prof. S. Chattopadhyay, Calcutta University, Kolkata
Prof. S. Banerjee, IIT Kharagpur
Prof. A. Dhar, IIT Kharagpur
Prof. D. Biswas, IIT Kharagpur
Prof. T.K. Bhattacharya, IIT Kharagpur
Prof. S. Das, IIT Kharagpur
Prof. S.K. Varshney, IIT Kharagpur

Participation

Teachers from AICTE approved institutions are eligible to attend this course. Application (format attached) duly filled in and endorsed by the Principal/Director may be sent to the Course Coordinator latest by September 10, 2012 with a copy by e-mail for quick processing.

Course Fee

There is no course fee. TA will be paid as well as boarding & lodging will be provided to the participants.

How to reach

Kharagpur is an important Railway junction and it is well connected to almost all parts of the country. Kharagpur, 116 Km. west of Kolkata, is two hours motor drive from Kolkata and also is connected to Howrah Railway Station by frequent local trains. The Institute is about 4 Kms. away from Kharagpur Railway Station. Taxis, Auto-rickshaws, cycle rickshaws are available.

Accommodation

Shared accommodation (in guest houses/hostels) will be provided in IIT Kharagpur during October 3 to October 17, 2012 for outstation participants only.

All contacts should be made to:

Prof. Pallab Banerji
Course Coordinator: QIP sponsored short term course on
Nanotechnology for electronic & photonic applications
Materials Science Centre
Indian Institute of Technology
Kharagpur -721 302
Email: pallab@matsc.iitkgp.ernet.in;
pallab_banerji@yahoo.com

Phone No. : 03222-283984/281658/282273
Fax: 03222-255303/282700

Registration Form

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Continuing Education Programme (CEP)

Indian Institute of Technology, Kharagpur

Venue: Materials Science Centre, IIT, Kharagpur

Name of the faculty participant:_____

Designation:_____

Department:_____

Educational Qualification:_____

Institution:_____

Address:_____

_____

Teaching/Research/Industry Experience:

Organization(s)	From (Month/Year)	To (month/Year)

Whether the institute is an Engineering/Management institute or University department:_____

Contact Address of the Applicant:_____

_____

_____

Tel/Mobile:_____

E-mail:_____

Endorsement by Head of the Department/Supervisory Authority of the Participant:

The above applicant is a member of faculty in the _____ Department of our institute. If the applicant's registration application is accepted, we will allow him/her to participate. We understand that if the candidate is selected for the course, he/she will be paid TA as per AICTE norms and accommodation/local hospitality will be taken care of by the organizers of the course. We further note that participation in this programme will be counted towards professional growth and career development of the participant.

Signature_____

Designation_____

(with seal)