



One week short-term course

on

## Emerging Materials: Synthesis and Characterization

June 06 - 10, 2016

National Institute of Technology, Kurukshetra, Haryana

### Coordinators

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### Organizing Committee

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### Introduction

Emerging materials at nanometer scale have been studied over several years and many physical properties related to the nanometer size have been explored. A better fundamental understanding and various potential applications increasingly demand the ability and instrumentation to observe measure and manipulate the individual nanomaterials and nanostructures. Characterization and manipulation of individual nanostructures require not only extreme sensitivity and accuracy, but also atomic level resolution. Various advance techniques play a central role in characterization and measurements of nanostructured materials and devices. The development of novel tools and instruments for handling these emerging materials is one of the greatest challenges in nanotechnology.

### Objectives of the Course

This course will highlight recent developments and advances in emerging materials and their Characterization techniques. The objective of this programme is to educate the young teachers and researchers about the nanomaterials based devices and to disseminate practical knowledge about this field. The course includes a series of informative lectures followed by laboratory visit to demonstrate the various characterization techniques e.g. XRD, XRF, SPM, SEM, UV-Visible and PL spectroscopy in an actual lab environment. An Overview of Nanomaterials; Various techniques for synthesis of nanomaterials: Sol-Gel method, Chemical Vapour Deposition, Sputtering and Pulse Laser Deposition techniques etc. as well as various characterization techniques e.g. X-Ray Diffraction, Transmission Electron Microscopy (TEM), Scanning Electron Microscopy (SEM), Scanning Probe Microscopy (SPM), X-Ray Florescence (XRF), UV-Visible Spectrophotometer, PL Spectroscopy, dielectric spectroscopy etc. will also be covered.

### About Kurukshetra

Kurukshetra-the land of the Mahabharata where the quest for wisdom and Absolute started with the rendering of sermon by Lord Krishna and also known as Dharmakshetra. This place from where knowledge spread far and wide was chosen as his capital by King Harshwardhana. The famous tourist spots are Brahasarovar, Jyotisar, Dharohar, Shek Chehli's Tomb, Panorma, Sannihit Sarovar, Kalpana Chawala Planitarium, etc. In addition to its spiritual significance, the town has steadily developed into a centre of academic excellence. Kurukshetra is a railway junction on the Delhi-Ambala section of the Northern Railway. It is about 160 kms from Delhi. The Institute is situated on the Kurukshetra- Pehowa Road, about 6 kms from the Railway station Kurukshetra. The nearest road junction is Pipli which is on the National Highway No.1 (Sher Shah Suri Marg). The Institute is about 10 kms from Pipli.

### **About the Physics Department, NITK**

The Department offers curricula consisting the basic principles of Physics besides emerging areas of Technology to the students of all B. Tech branches and a number of courses are offered as Non Departmental Electives in the 7th & 8th semesters as well. The Department also runs two 4-semester M.Tech. programme in Instrumentation and Nanotechnology and offers Ph.D. in different areas to keep synergy with the evolving innovations and developments in various fields of experimental and theoretical Physics.

Apart from this, the department has highly sophisticated instruments facilities. The faculty members hold various R & D Projects and also deliver expert lectures on different platforms.

### **Who should attend**

Faculty members/research scholars from academic institutes approved by the AICTE/ UGC/MHRD and Scientists/Engineers working in Private/Public/Government Organizations/ Industries, Research & Development establishments etc. can attend the course. Application should be made on the registration form and should accompany registration fee of **(Rs. 3000/- for faculty and Rs. 2000/- for students)** per person. Participants will be provided meals and tea during the sessions. However, accommodation can be arranged in hostel/guest house on nominal payment basis subject to the availability. No TA/DA will be paid to the participants. Participants will be selected on first-come-first serve basis up to a maximum of 30. The registration form, complete in all respects, duly forwarded by the Head of the Institution/Department, accompanied by demand draft of requisite amount and covering letter should reach the Course Coordinator on or before May 15, 2016. Registration fee is to be paid in advance through a crossed bank draft in favor of “**Director, NIT Kurukshetra**” payable at **Kurukshetra**. The brochure with registration form can be downloaded from Institute website [www.nitkr.ac.in](http://www.nitkr.ac.in)

### **Important Dates:**

**Last date of Registration: May 15, 2016**  
**Notification about selection: May 20, 2016**  
**Confirmation from participants: May 30, 2016**

### **Registration form should be sent to:**

**HOD/Coordinator – STC-2016**  
**Department of Physics**  
**National Institute of Technology Kurukshetra**  
**Kurukshetra 136119 Haryana**

**E-mail: stcnit2016@gmail.com**



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### Registration Form

- 1) Name :
- 2) Designation :
- 3) Affiliation :
- 4) (a) Address for Communication :
- (b) E-mail :
- (c) Contact No. :
- 5) Registration Fee details : (DD No., Amount, Date)
- 6) Accommodation required (Y/N) :

(Please specify the dates)

(Signature)

Forwarded by (Director/Principal/HOD):-

Please send the registration form and fees (Registration fee is to be paid in advance through a crossed bank draft in favor of “**Director, National Institute of Kurukshetra**” payable at Kurukshetra to the following address: **Coordinator, STC--2016, Physics Department, National Institute of Technology Kurukshetra-136119.** E-mail: [stcnit2016@gmail.com](mailto:stcnit2016@gmail.com)