# One Day Workshop On Terahertz Technology and its Applications

A Continuing Education Programme of
Indian Institute of Technology
Kharagpur

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***Coordinator***

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*Organized by*

**Kalpana Chawla Space Technology Cell,**
**Indian Institute of Technology**
**Kharagpur – 721 302**

## OBJECTIVES AND INTRODUCTION

The Terahertz region of the electromagnetic spectrum that lies between the microwave and the optical, corresponding to frequencies of about 300 billion hertz to 10 trillion hertz (wavelengths of 1 millimeter down to 30 micrometers). This radiation does have some uniquely attractive qualities: For example, it can yield extremely high-resolution images and move vast amounts of data quickly. And yet it is non-ionizing, meaning its photons are not energetic enough to knock electrons off atoms and molecules in human tissue, which could trigger harmful chemical reactions. The waves also stimulate molecular and electronic motions in many materials—reflecting off some, propagating through others, and being absorbed by the rest. These features have been exploited in laboratory demonstrations to identify explosives, reveal hidden weapons, check for defects in tiles on the space shuttle, and screen for skin cancer and tooth decay. Due to these, it has attracted a lot of attention in recent years in developing THz technology as an imaging technique for biomedical, industry, and security applications.

For a long time the generation of THz radiation was a major issue. In the past 20 years the possible approaches to generation and detection of THz radiation have evolved. The workshop gives an overview over radiation in this spectral region and its possible applications. Main focus of the lecture are concepts for THz generation that are based on optical principles (quantum cascade lasers, gas and pulse lasers) as well as electronic means (mixers, tunnel diodes, superconducting contacts). Special attention is paid to time domain spectroscopy which has become a commercially available technology in the past few years.

## SCOPE

This workshop provides with an overview of the unique properties of terahertz waves and potential applications as well as the state of the current terahertz systems and their major technological challenges.

The topics covered in this workshop include:

1. Terahertz sources
2. Terahertz detectors
3. Sensing with terahertz radiation (terahertz spectroscopy and imaging)
4. Terahertz Antenna
5. Terahertz Applications

## COURSE FACULTY

1. Prof. B.K.Sarkar
   IIT Kharagpur

2. Prof. S.K. Ray
   IIT Kharagpur

3. Dr. Goutam Chattopadhyay
   Jet Propulsion Laboratory,
   Los Angles, USA

4. Dr. Arabinda Ghosh
   RCI, DRDO
   Hyderabad

## WHO SHOULD ATTEND

Faculty members and students of University and engineering colleges , scientists/ engineers of R&D institutions and those who want a thorough guided tour on Terahertz Technology and its applications.
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## ELIGIBILITY

Final year students of B.E. / B.Tech/ M.E / M.Tech or equivalent courses or degree in Electronics/ Telecommunication / Electrical Engineering.

## REGISTRATION

**Participants should apply by 07th July, 2014. Course fee is Rs. 2,000/- per participant**. Participants will be provided course materials in a CD, working lunch, tea & snacks during the course hours.
**(Due to limited capacity of the lecture hall, the no. of the participants** will be limited. Participants will be selected as first come first basis.)
The registration fees in Bank Draft should be in favour of ***'CEP - STC, IIT, Kharagpur'*** payable at Kharagpur along with completed registration form to be sent to Prof. B.K. Sarkar, Kalpana Chawla Space Technology Cell, I.I.T., Kharagpur – 721 302, West Bengal, INDIA.

## LOCATION OF WORKSHOP

**IIT Kharagpur – Calcutta Extension Center.**
**HC Block, Sector III, Salt Lake City Kolkata, West Bengal - 700106**

**Telephone no. : 033-23379793**
**TeleFax : 033-23348091**

**Enquires should be addressed to :**
Prof. B.K. Sarkar,
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**Phone : 91-3222-282298**
**Telefax : 91-3222-282299**
**Fax : 91-3222-255303**


## REGISTRATION FORM

**One Day Workshop**

**On**

**Terahertz Technology and its Applications**

**August 01, 2014**

***Please complete the details below and mail it to the address overleaf along with the registration fee.***

1. Name :……

2. Designation :……

3.Address (College/Office):……

:……

4. Phone (Mob.) :……...
Phone (Res.) :…….

E-mail (compulsory) :……

5. Male/Female:……..…

6. Highest academic qualification:……...

7. Bank Draft No…….. Date……..

Amounting Rs……drawn on…….Bank

Date : Signature of the Applicant

Place :