

# Molecular Beam Epitaxy (MBE) Technology in the Field of Material synthesis and Device Fabrication

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## Overview

The Molecular Beam Epitaxy (MBE) is a well-known technology for the synthesis of epitaxial layer mostly applicable for compound semiconductor (III-V, II-VI) device fabrication process. The technology deposited epi-layers of compound semiconductors from the gas phase to solid phase with a high optical quality on the large lattice mismatch substrate. There are lots of advantages of the technique compared with ancient liquid Phase Epitaxy (LPE) for the growth of multilayer and hetero-structures. In this course the following topics will be discussed elaborately

- The Technology and Design of Molecular Beam Epitaxy
- Impact made by MBE in research
- Semiconductor electronic devices
- Semiconductor optoelectronic/photovoltaic/ devices
- MBE as a production epitaxial technology

The technology is really important to develop the modern opto-electronic and electronic devices. The quantum well, multi-quantum well, quantum dot based laser devices need the MBE growth techniques in its initial stages. The solar cell, optical detectors, transistors, high electron mobility transistors (HEMT) and Metal Oxide Semiconductor based transistor required high quality epi-layer for their excellent performances. The MBE technique can fulfill the requirement of the above devices. Though the technique has lots of advantages in the research and commercial field, a very few researchers are trained by the same in India. Therefore it is mostly required in the present ages to get ideas and to train the Indians in the said field to cope up the cutting edge technology.

<b>Modules</b>	<b>Module A: Design of MBE : October 28 – October 29, 2016</b> <b>Module B : Applications of MBE: October 30- November 1, 2016</b> <b>Number of participants for the course will be limited to fifty.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>• <b>Executives, Scientists, engineers and researchers from Industries, educational Institute and R &amp; D laboratories.</b></li><li>• <b>Students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.</b></li></ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad : US \$200</b> <b>Industry/ Research Organizations: Rs. 6000</b> <b>Academic Institutions: Rs. 4000/-</b> <b>Students/ Research Scholars: Rs. 2000/-</b> The above fee include all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges. The participants will be provided with accommodation on payment basis.

## The Faculty



**Professor Mohamed Henini** is Professor of Applied Physics in the department of Physics and Astronomy in the University of Nottingham, UK. His research interests include Processing and upscaling of nanostructured materials by MBE process, Near Surface 2DEGs, Growth of p-Type Modulated Double Quantum Wells, Heterostructures on high-index planes, Quantum Dots and Quantum Rings on high-index planes, Novel Superlattices, MBE Growth of Dilute Nitrides and Bismides, Deep Level Transient Spectroscopy etc.



**Dr. Aniruddha Mondal** is an Assistant Professor of Physics department NIT Durgapur. His research interest is Fabrication of III-V, III-N semiconductor material, 1d metal oxide semiconductor nanostructure using glancing angle deposition technique and fabrication of UV-Vis detector, plasmonic detector, hybrid semiconductor detectors.



**Dr. Soumen Basu** is an Assistant Professor of Physics department NIT Durgapur. His research interest is Nanostructured materials, Multiferroics materials, Rare earth orthoferrites, Multiferroic polymer nanocomposites, Ferrite based gas sensing materials, Rare earth doped Bismuth ferrite, Graphene based materials, Rare earth chromate for SOFC.

## Course Co-ordinator

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&

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## Registration Process

Registration for GIAN course is not automatic because of the constraints on maximum number of participants allowed to register for a course. In order to register for one or multiple non-overlapping courses, you have to apply online using the following steps:

1. **Create login and password at [www.gian.iitkgp.ac.in](http://www.gian.iitkgp.ac.in)**
2. **Login and complete the registration form.**
3. **Select courses**
4. **Confirm your application and payment information.**
5. **Pay Rs.500 through online payment gateway.**

The course coordinator of the course will go through your application and confirm your selection as a participant one month before the starting date of the course. Once you are selected you will be informed and requested to pay the full fees through online gateway service.

## Venue:

**Dept. of Physics, NIT Durgapur, West Bengal, India, 713209**

<http://www.nitdgp.ac.in>