Low Dimensional Structures and Devices: From Research to Industry

January 6 th to 12 th 2017 at Anna University, Chennai

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Overview

Molecular Beam Epitaxy (MBE) technology was developed in response to the increasing attention paid by the semiconductor community to GaAs devices of increasing complexity and more to low dimensional structures. MBE is an epitaxial deposition technique which involves laying down layers of materials with atomic thicknesses on to substrates. MBE has expanded in importance over the past thirty years from a pure research domain into commercial applications. MBE is important because it enables new device phenomena and facilitates the production of multiple layered structures with extremely fine dimensional and compositional control. The technique can be deployed wherever precise thin-film devices with enhanced and unique properties for computing, optics or photonics are required.

This course will include the research fundamentals technology and design of Molecular Beam Epitaxy, Impact made by MBE in research, an advanced deposition technique for semiconductor optoelectronic, photovoltaic and electronic devices and production epitaxial technology of MBE.

The main objective of this course is to train the participants to the fundamentals of technologically important semiconductors and functional materials and to enhance the capability of the participants to identify, control and manipulate device structures through better understanding of defects using DLTS.

The primary objectives of the course are as follows:

i) Training the participants to the fundamentals of technologically important semiconductors and functional materials
ii) Providing the technical details on Molecular Beam Epitaxy to realise quantum structures.
iii) Enabling the participants to design, integrate complex multiple systems including growth of layered structures of specific dimensions and characteristics
iv) Enhancing the capability of the participants to identify, control and manipulate device structures through better understanding of defects using DLTS.

Modules	**Course Start Date : 6 th Januray to 12 th Januray 2017** ▪ Technology and design of Molecular Beam Epitaxy. ▪ Manuscript Discussions ▪ Impact made by MBE in research ▪ Semiconductor optoelectronic, photovoltaic and electronic devices ▪ MBE as a production epitaxial technology ▪ Study of Defects ▪ Importance of DLTS and Analysis of Data ▪ Device Structure **Number of participants for the course will be limited to fifty.**
You Should Attend If…	▪ Executives, engineers and researchers from manufacturing, service and Government organizations including R&D laboratories. ▪ Student students at all levels (BTech/MSc/MTech/PhD) or Faculty from reputed academic institutions and technical institutions.
Fees	The participation fees for taking the course is as follows: **Participants from abroad: US $500** **Industry/ Research Organizations: Rs.3000** **Academic Institutions Staffs/faculty: Rs.2000** **Academic Institutions students: Rs.1000** The participants will have to take care of their travel, accommodation and food. For any queries regarding registration or other practical information, please contact the Coordinator/Local Coordinator.

The Faculty

Prof.Mohamed Henini is Professor of Applied Physics, School of Physics and Astronomy, University of Nottingham,England. He was awarded the PhD degree by the Nottingham University for research in Deep Level Transient Spectroscopy (DLTS) in 1984. He worked in the Electrical and Electronic Engineering Department in the area of Transmission Line Modelling (TLM). In September 1986 he transferred to the Physics Department where he is now the Professor of Applied Physics.He has over 20 years' experience of Molecular Beam Epitaxy (MBE) growth and has published more than 800 papers.

He has particular interests in the MBE growth and physics of self-assembled quantum dots using electronic, optical and structural techniques. His main research focuses on the physics and technology of Molecular Beam Epitaxy (MBE) growth for III-V electronic and optoelectronic devices. He has particular interests in MBE growth on high-index planes, two-dimensional systems and in self-assembled quantum dots. The semiconductor materials systems of interest include: (Ga,Al,In)(As,N) and GaAsBi . He is also interested in the study of electrically active defects (known as traps) in semiconductors. Deep Level Transient Spectroscopy (DLTS), which is a unique and powerful tool to study deep levels in semiconductors, is used to investigate a variety of semiconductor systems.

He has authored and co-authored over 750 papers in international journals and conference proceedings. **He is the founder of two international conferences namely, Low Dimensional Structures and Devices (LDSD) and Epitaxial Semiconductors on Patterned Substrates and Novel Index Surfaces (ESPS-NIS). He edited four books which were published by Elsevier and serves in the Editorial Board of several scientific journals.** He was selected in the 7th edition (2003-2004) and 9th edition (2006-2007) of Who's Who in Science and Engineering; 23rd Edition of Who's Who in the World (2005); 31st Edition of the Dictionary of International Biography (2004).

Dr.J.Kumar is the Director of Planning & Development and professor of Crystal Growth Centre, Anna University. He is also local coordinator of GIAN, Anna University. His area of specialization includes MOCVD, Semiconductor Crystal:Growth, Characterization and Device Fabrication.

Course Co-ordinator

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