

OPTOELECTRONICS AND NANOFABRICATION LAB

Lab Incharge: Dr. Utpal Das

1. General

Name of the lab	OptoElectronics and NanoFabrication Lab
Location	ACES122/123(NanoFabrication Laboratory) ACES 129 (Optoelectronics Laboratory)
Phone number	91(512) 259-7360

2. Research areas

Sl no	Research areas
1	Multiquantum Well Intermixed Waveguide Grating Assisted Couplers
2	High Speed Waveguide Photodiodes
3	Photodiode Arrays
4	SiGeC/SiC Quantum Dash LEDs on silicon by spin-on technique
5	Laser assisted vision through Fog

3. Facilities in the lab(equipments/workstations etc)

(a) Optoelectronics Lab

Sl no	Name of equipment/workstation/software etc	Quantity
1	Optical Bench and Optical waveguiding setup	1
2	ps-pulsed laser source at 980nm, 1550nm, and 400nm	1
3.	Sorption pump	1
4.	CO2 laser (10W)	1
5.	Laser Scanner (1kHz)	1
6.	MCT detectors (4kHz, 4kV/W)	1
7.	Motorized positioners(0.1micron)for optical waveguide measurements	1
8.	Data acquisition cards and systems (GHz).	1
9.	Tunable laser (1270-1650nm)	1
10.	Lock-in Amplifiers.	1
11.	Oscilloscopes (60MHz)	1
12.	Signal Generators	1

13.	Power Supplies	1
14.	Blue DPSS laser	1
15.	White light source	1

(b) Nano-Fabrication Lab

Sl no	Name of equipment/workstation/software etc	Quantity
1	MJB3 Mask Aligner (i-line, 3inch substrates)	1
2	Baking Oven (1100 Deg. C)	1
3.	Ziess Microscope (50X obj)	1
4.	Photoresist Spinner (4800rpm)	1
5.	Optical surface profiler (vertical 0.01nm, Horizontal 2.5micron)	1
6.	Millipore Ultrapure water system	1
7.	Reactive Ion Etch System (Methane Chenistry)	1
8.	E-Beam evaporator (turbopump driven, 6kW, 4pocket, 6cc)	1
9.	Class 100 Developing Station, Acid station, and Solvent ststion	1
10.	Ultrasonic cleaner	1
11.	Home built Rapid Thermal Lamp Anneal System (850C at 5s)	1

4. Ongoing projects

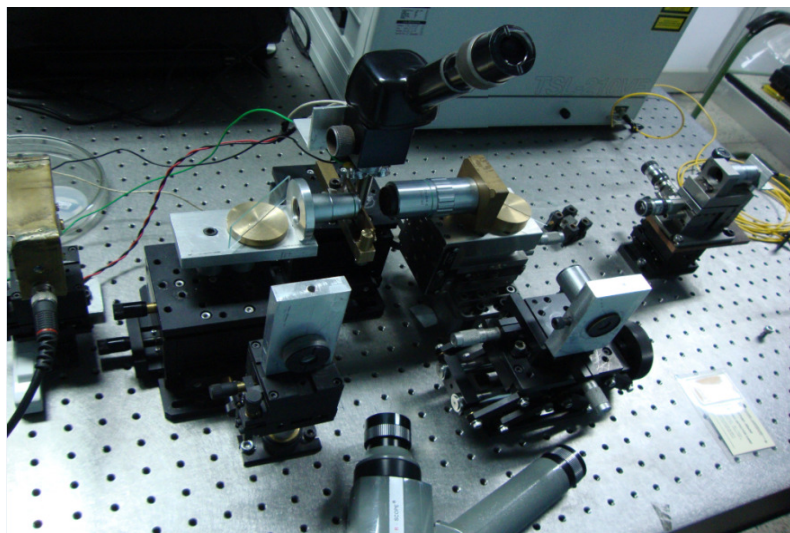
Sl no	Ongoing project name	YEAR	ORGANIZATION
1	Nano-sized SiC based quantum structures on Si by spin-on techniques.	2010	IITK
2	Intelligent Sensors Lab: Photodiode array is to be developed for visual sensing	2010	IITK

5. Recent publications –

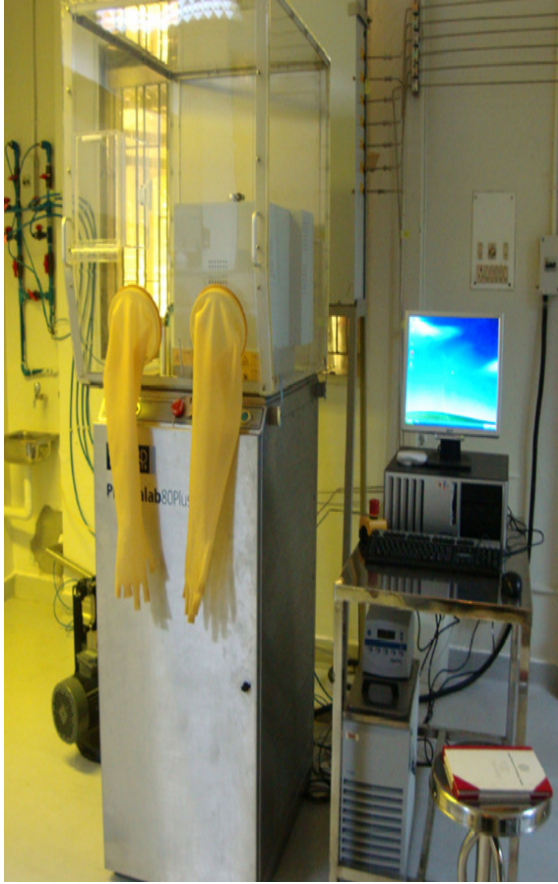
Sl no	Paper title	Journal name and issue
1	“Optical Quality SiC nano-structures by Spin-On Technique and Anneal on Si”, A Mondal and U Das.	J. Phys. D: Appl. Phys. <u>42</u> , 234002-234006 (2009)
2	“Design of a Grating-Assisted Lateral Directional Coupler by Impurity-Induced Quantum Well Intermixing of InGaAs/GaAs”, A. V. Barve and U. Das.	Special Issue, joint publication of IEEE J. Lightwave Technol., <u>25</u> , 2448(2007) and Optical Society of America.

6. PHOTO GALLERY:-

Optical Waveguide setup with tunable laser



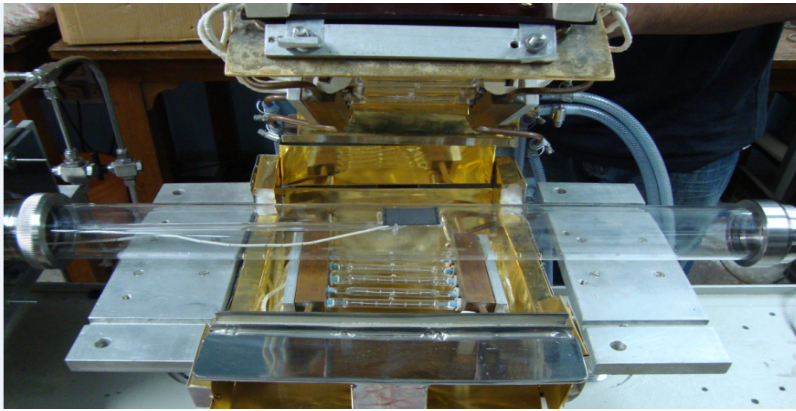
REACTIVE ION ETCH SYSTEM



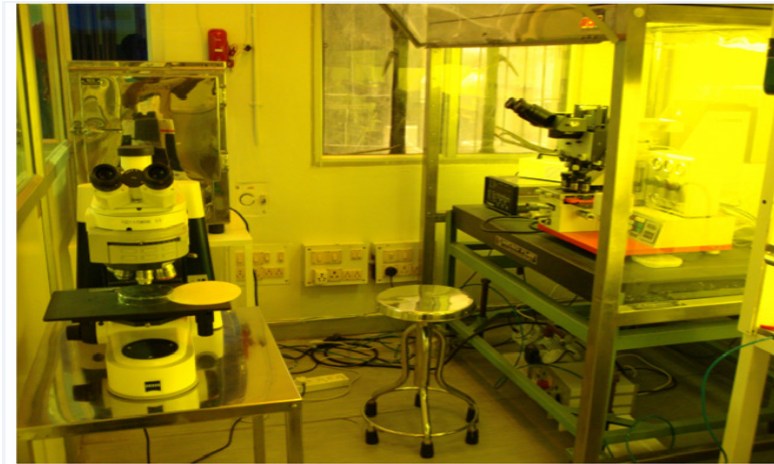
OPTICAL SURFACE PROFILER



LAMP ANNEAL SYSTEM



PHOTOLITHOGRAPHY ROOM



FOG VISION INSTRUMENT

