

# Characterization Facilities, Nano Characterization Laboratory, Centre for Materials Science & Nanotechnology (CMSNT)



**Atomic Force Microscopy (AFM)** provides images on the topography of a sample surface by scanning the cantilever over a region of interest. Any solid insulating/conducting film based samples may be characterized.



**Scanning Tunneling Microscopy (STM)** is based on the quantum mechanical phenomenon known as tunnelling. Any conducting solid into regions of space may be used as samples.



**Fourier Transform Infrared Spectroscopy (FTIR)** relies on the fact that most molecules absorb light in the infra-red region of the electromagnetic spectrum. Any powder and thin film based samples may be characterized to identify the bonding information.



**Optical Microscope** creates a magnified image of an object specimen. It is used extensively to study the microscopic nature of materials as used in microelectronics, biotechnology, pharmaceutical research, mineralogy and microbiology.



**Contact angle goniometer** using an optical subsystem to capture the profile of a pure liquid on a solid substrate based on the surface wetting behaviour with contact liquid. The angle formed between the liquid–solid interface and the liquid–vapor interface is the contact angle.



**Keithley Source Meter 2450 unit integrated with heating/gas sensing system** is used to measure the response of electrical parameters with temperature/gas sensing properties. In addition, an **Agilent LCR meter** is present to measure the inductance, capacitance and resistance of a circuit.

# Instrumental Facilities, Nanotechnology Laboratory, Centre for Materials Science & Nanotechnology (CMSNT)



**Electron Cyclotron Resonance Plasma Enhanced Chemical Vapour deposition** system is used to deposit the high quality thin film using chemical precursor. The equipment is widely used for amorphous Silicon thin film deposition for solar cell, TFT microelectronic applications.



The **Photocatalytic reactor** is used to degrade the organic waste such as dyes, pharmaceutical effluents etc.. The reacting species is stirred by magnetic stirrer.



**UV-Vis spectrophotometer** refers to absorption spectroscopy or reflectance spectroscopy in the ultraviolet-visible region. Any powder, liquid, thin film based samples may be characterised to find the optical band gap, surface plasmon resonance etc.



**Spin Coater** is an instrument to deal with coating technology for uniform deposition of thin films on flat substrates. Additionally, heating system is embedded with the same for better adhesion.



**Atmospheric Controller Furnace** are designed and manufactured to accommodate wide processing areas where inert atmosphere is required to protect heating samples that are prone to oxidation. Double shell atmosphere furnace with fan cooling; temperature range upto 1200°C.



**Magnetron DC Sputtering** is a Deposition technique in which positively charged ions from the plasma are accelerated towards the negatively charged electrode or "target". Any kinds of metals, Cu, Ag, Au, etc. may be deposited on flat substrates using this system.

# INSTRUMENTS AT NANOPROCESSING LABORATORY F114

## CENTRE FOR MATERIALS SCIENCE AND NANOTECHNOLOGY

### SIKKIM MANIPAL INSTITUTE OF TECHNOLOGY, MAJHITAR



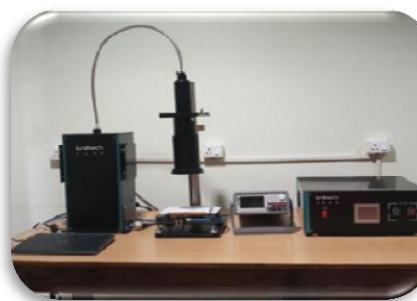
**Two probe** is most commonly used for the measurement of resistivity of very high resistivity samples like sheets/films of polymers. The resistivity measurement of such samples is beyond the range of Four Probe Method.



**CH instrument** is capable of a wide variety of electrochemical techniques, and is available with integrated simulation and fitting software functions for both impedance and cyclic voltammetry.



**Four probe** apparatus is one of the standard and most widely used apparatus for the measurement of resistivity of semiconductors.



**Solar simulator** provides a controllable indoor test facility under laboratory conditions, used for the testing of solar cells, sun screen, plastics, and other materials and devices.



**APCVD setup** is used to produce the desired thin film deposit process on the substrate surface in which the substrate is exposed to one or more volatile precursors, which react and/or decompose on the substrate surface to produce the desired thin film deposit.

# Request Form

## Centre for Materials Science & Nanotechnology (CMSNT), Sikkim Manipal Institute of Technology, Sikkim Manipal University

**Name of Instrument/Facility:** \_\_\_\_\_

Nature of Work: UG/PG/PhD./ Project (Please specify in brief)

### **User Information**

Name of Student: \_\_\_\_\_

Name of Supervisor: \_\_\_\_\_ Employee ID: \_\_\_\_\_

Name of Department: \_\_\_\_\_

Full address for communication \_\_\_\_\_

Phone Number: \_\_\_\_\_ Email: \_\_\_\_\_

Type of Sample: \_\_\_\_\_

No. of Samples: \_\_\_\_\_

Signature of Student

Date: \_\_\_\_\_

Signature of Supervisor

Date: \_\_\_\_\_

Signature of HOD

Date: \_\_\_\_\_

- Please send the duly filled form through Email to [Somenath.c@smit.smu.edu.in](mailto:Somenath.c@smit.smu.edu.in)