

Department of Physics

Study Tour Report 2017-18

The study tour visit of the B.Sc. III Physics student was organized to visit **Department of Physics and School of Nano-science and Nanotechnology**, Shivaji University Kolhapur on **2nd February 2018** between **11:30 a.m. to 04:30 pm** under the guidance of **Dr. V.V. Killedar**. This visit is part of **B. Sc.III physics** curriculum of shivaji university Kolhapur. There is a provision of 10 marks for the study tour.

On **2nd February 2018, between 11:30 a.m.to 04:30 p.m.**, B.Sc.III students along with **Ms A. S. Patil** and **Mr. D. S. More** visited School of Nanoscience and Nanotechnology with the prior permission of **Prof. (Dr.) P. S. Patil**, Coordinator of school of nanoscience and technology. In the beginning, **Mr. Aviraj Teli** introduced us about the school and the instrumentation facilities available in this school. He told us about the importance of nanotechnology in coming future. He also given the information about the admission process, the courses run by this department.

Mr. Teli gave us information about various thin film deposition techniques such as Spray pyrolysis method, Electrospinning unit, SILAR method, Deep coating method, Spin coating method. He also gave information about the instruments which are used for the characterization of deposited thin films like Ultra probe Sonicator, UV- VIS spectrophotometer.

In the biology department of this school we have seen the refrigerator in which biological samples are maintained up to temperature -20°C . In this lab have seen centrifuge machines , electrophoresis unit autoclave biospectrometer etc.

After taking lunch break of half hour we went to Physics Department in the Shivaji University at **02.30 p.m.** with the prior permission of **Prof. (Dr.) V. J. Fulari**, Head department of physics. **Prof. K. Y. Rajpure** introduced us about the Department of Physics and the instrumentation facilities available in the department firstly we visited the solid state physics laboratory. In this laboratory we saw **Scanning Electron Microscope (SEM), Sputter Coater and FT-Raman spectrometer**. Then we visited to PIFC (Physics Instrumentation Facility Centre). In this centre we saw **X- ray diffractometer, IV characteristic of solar cell, Contact angle Goniometer, CT- Meter, Spectrofluorometer/ Fluoromax 4, LCR meter bridge, Field Emission- Scanning Electron Microscope (FE-SEM), surface area analyzer, Atomic Force Microscopy, Surface Profiler, Photoluminescence meter** etc.

Mr. Krushna gave information about scanning electron microscope (SEM). He told that scanning electron microscope is used to study morphology of any material. The cost of SEM is **65 lakhs**.

Then next instrument is sputter coater. It is used for preparation of samples using gold coating for SEM. The cost of sputter coater is **10 lakhs** rupees. Then Raman spectrometer, which is also used for the conformation of synthesized materials. It is cost **60 lakhs**. In common Facility centre there is surface area analyzer which is used to detect ion to the surface area of material by using wire atmosphere. The cost of these instruments is **12.5 lakhs**. He also gave information about FT-Raman, which is used to study chemical bonds in the material.

We also saw **LCR Meter Bridge** related to electronics this meter bridge is used for to measurement of inductance, capacitors and resistance.

Then we went to the important instrument which is **X-Ray Diffractometer**. Mr. Ram Surywanshi gave us information of X-ray diffractometer. X-ray diffraction is a powerful tool used to uniquely identify the crystalline phases present in materials and to study the structural properties like strain, grain size, phase composition, defect structure, and preferred orientation etc. The sample used for this instrument is in the form of powder or solid thin film.

Mr. Gopal Kulkarni gave us information about Surface profiler. This instrument is used to measure thickness of thin films. Also we saw solar stimulator and solar power system instruments like solar heater, solar P-V Panel etc. At the end we saw advanced FE-SEM which cost around **1.5 crore rupees**.

From this study tour we come to know that there are valuable & costly instruments useful for material characterization in research work. These instruments use basic principles of physics in their design. We are greatly inspired by the valuable information given by **Dr. K. Y. Rajpure**. We also know the scope of Physics subject in the development of technology.

We are very much thankful to **Dr. V. V. Killedar, HOD of physics** and **Ms. A. S. Patil & Mr. D.S. More** for arranging this study tour which creates awareness about research amongst the students. We are also thankful to **Principle Dr. C. J. Khilare** for giving permission to organize the study tour.

Study Tour To Visit Deptt.of Nanoscience & Deptt.of Physics, Shivaji University, Kolhapur(2/2/2018)

