MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

DEPARTMENT OF PHYSICS

"Workshop on AFM and STM"

Dates: 06-10th April 2020

Venue: Seminar Hall, Department of Physics

Who can participate? Ph. D. students, Undergraduate & Post-graduate students of MNIT Jaipur **only**, who are interested in learning about necessary tools used for research writing in the broad areas of physics, materials chemistry, materials science, and engineering.

Aim and scope of the workshop: Scanning Probe Microscopy (SPM) method which involves the local interactions of a probe with the surface of the specimen, is widely used in experimental research in various streams of science and engineering. The most commonly used methods in this category are scanning tunneling electron microscopy (STM) and atomic force microscopy (AFM). SPM started with the invention of the STM in 1981 while, AFM was invented in 1986. With atomic scale structural and spectroscopic imaging capabilities, Scanning Tunneling Microscopy and Spectroscopy (STM/S) has become a very important tool to study the surface structure, growth patterns and local electronic properties down to atomic scales. This workshop will deal with basic of these tools, different modes of operation, data acquisition, image processing, data analysis and instrumentation. Participants are advised to bring their own laptop computers. Further information will be provided before/during the training sessions.

This workshop is an attempt to provide answers for queries of the scholars and make their research work easier, more scientific, need-based, and genuine.

The workshop will include 2 hours' theory component and 2-3 hours of an exercise/assignment component (as needed) each day on the related topics. Tentative time schedule of the workshop is as follows:

Date/Time	Title/Topic
06. 04. 2020 (3:00-5:00pm)	Instrumentation and Modes of AFM, Operation and Applications STM: "Stairway to Heaven" to touch atoms and molecules
07. 04. 2020 (3:00-5:00pm)	AFM: Sample preparation, Data Acquisition, AFM Image Processing
08. 04. 2020 (3:00-5:00pm)	How to Gain the Best Performance from Your AFM Data: Data Treatment and Analysis
09. 04. 2020 (3:00-5:00pm)	STM Imaging: Imaging Crystalline Surfaces and Atomic States Spectroscopy: AC modulation Technique, Conductance Map and Data Analysis
10. 04. 2020 (3:00-5:00pm)	To Design a STM: Coarse and Fine Positioner, Piezoelectric Scanner and Walker, Vibration Isolation, Electronics and Control

There are no participation fees, and the maximum number of participants is limited to 40 students only. The participants will be selected based upon their statement-of-purpose filled in the registration form. A performance report/certificate will be issued to the successful candidates.

Contact: mnit.phy@gmail.com

Register Here

Before 03-04-2020

Also, check the details of upcoming workshops on the next page.

MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

DEPARTMENT OF PHYSICS

Details of the Series of Workshops

Dates: January-April 2020

Venue: Seminar Hall, Department of Physics

Aim and scope of the workshops: Below mentioned workshops will focus on the essential tools for experimental research in the broad areas of physics, material science, chemistry, and other allied streams. Training sessions on scientific writing tools like MS-Word, Excel, PowerPoint, Grammarly, Reference Manager, Mendeley, LaTeX, gnuplot and analytical techniques like XRD, SEM, TEM, STM, and AFM will be conducted. These tools and techniques are widely used in experimental research in various streams of science and engineering. Details of the fabrication methods for nanomaterials and thin films are considered crucial for the design and development of new devices. Cyclic voltammetry is generally used to study the electrochemical properties of an analyte in a solution. LabVIEW is a powerful tool for customization of the experimental setups for efficient data acquisition and data analysis. The scope of these workshops includes basic and working knowledge on various characterization techniques along with lectures, tutorials, demonstrations and hands-on experience on some of these techniques.

On successful completion, the student will be able to compile reports/manuscripts based upon the analysis of his own/standard data using these technique(s).

Each workshop will include 2 hours' theory component and 2-3 hours of an exercise/assignment component (as needed) each day on the related topics.

Tentative schedule of the workshops:

S. No.	Name of the activity	Duration	Registration links
1.	**Workshop on Basic Research Tools**	20-24 January, 2020	Register Here
2.	**Workshop on Nanomaterials and Thin-Film Fabrication**	27-31 January, 2020	Register Here
3.	**Workshop on X-ray diffraction**	10-14 February, 2020	Register Here
4.	**Workshop on Electrochemical Techniques**	17-21 February, 2020	Register Here
5.	**Workshop on Electron Microscopy**	16-20 March, 2020	Register Here
6.	**Workshop on Programming with LabVIEW**	30 March – 03 April, 2020	Register Here
7.	**Workshop on AFM and STM**	06–10 April, 2020	Register Here

There will be no participation fees for all these workshops. The participants will be selected based upon their statement-of-purpose filled in the registration form. A performance report/certificate will be issued to the successful candidates.

For further details please contact: mnit.phy@gmail.com

Co-ordinators:
Prof. Kanupriya Sachdev, Dr. Srinivasa Rao N., Dr. Subhayan Mandal, Dr. Kamlendra Awasthi, Dr. Manoj Kumar, Dr. Anirban Dutta, and Dr. Debasish Sarkar