MALAVIYA NATIONAL INSTITUTE OF TECHNOLOGY JAIPUR

DEPARTMENT OF PHYSICS

Workshop on X-ray Diffraction

Dates: 10 - 14th February 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 X-ray diffraction technique and those researchers working in the broad areas of physics, materials chemistry, materials science, and engineering.

Aim and scope of the workshop: X-ray diffraction (XRD) is an essential analytical technique to determine the structure and crystalline nature of materials under study. Hence, the analysis of X-ray diffraction data is of utmost importance. The scope of this workshop is firstly to acquaint participants with a fundamental understanding of the theoretical basis as well as the practical applications of powder diffractometry followed by a demonstration of XRD analysis techniques. Secondly, to provide hands-on training to determine the crystal and molecular structure from the measured X-ray diffraction data. During the workshop student will learn about how to use crystallographic software for phase analysis as well as crystal structure analysis, Rietveld refinement, estimation of grain size, lattice parameters, lattice strain, substitution/doping analysis, etc. All the required software, sample data for analysis and other information will be provided during the training sessions.

Further, the workshop will provide an apt opportunity to the participants to analyse their own research data and also clarify their doubts for better understanding.

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
10. 02. 2020 (3:00-5:00pm)	Basics of X-Ray Powder Diffraction and Powder Diffractometer-Instrument Details
11. 02. 2020 (3:00-5:00pm)	Practical Aspects of Sample Preparation for XRD and Profile Fitting for Quantitative Analysis
12. 02. 2020 (3:00-5:00pm)	Peak Indexing, Calculation of Lattice Parameters, Estimating Crystallite Size and Lattice Strain
13. 02. 2020 (3:00-5:00pm)	X-ray Technique for Thin film Study and Fundamentals of Rietveld Refinement XRD Simulation
14. 02. 2020 (3:00-5:00pm)	Rietveld Refinement Using Expert High-Score Plus and Analysis of Standard and Non-ideal Samples

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 03-02-2020

Also, check the details of the Series of 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