

Coordinators:

- Dr. Brajesh Tiwari (Associate Professor of Physics)
- Dr. Mahuya Bandyopadhyay (Associate Professor of Chemistry)

Co-coordinators:

- Dr. Sourav Das (Associate professor of Chemistry)
- Dr. Ravi Kashikar (Assistant Professor of Physics)

Who Can Attend?

- Research Scholars (PhD, MS & M.Tech)
- Academicians
- Scientists, Engineers from R&D institutions & industry

Accommodation:

Suitably furnished accommodation will be made available for students if requested in advance in the IITRAM hostels on a nominal payment basis for outstation candidates on a sharing basis, subject to vacancy.

Invited Speakers:

- Prof. Anil Bhardwaj, Director PRL, Ahmedabad
- Prof. Indradev S. Samajdar, Metallurgical Engineering and Materials Science, IIT Bombay
- Prof. Sudhakar Chandran, Physics, IIT Madras
- Prof. Ambesh Dixit, Physics, IIT Jodhpur
- Prof. Deepak Chopra, Chemistry, IISER Bhopal
- Prof. P.K. Jha, Physics, M.S. University, Vadodara
- Dr. Rajesh Kumar Kushwaha, PRL, Ahmedabad
- Dr. Dheeraj Kumar Singh, Nano Sciences, CUG, Vadodara
- Dr. Mahuya Bandyopadhyay, Chemistry, IITRAM Ahmedabad
- Dr. Sourav Das, Chemistry, IITRAM Ahmedabad
- Dr. Brajesh Tiwari, Physics, IITRAM Ahmedabad

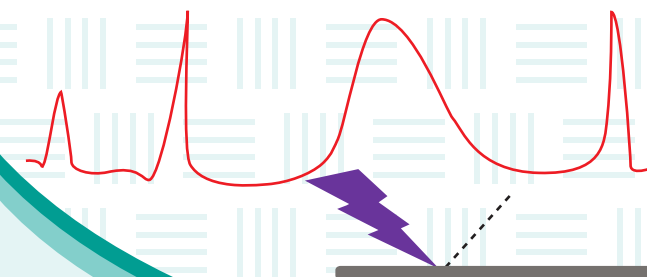
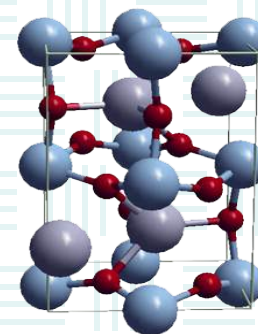


Scan Registration



6 Days 2nd Workshop on MATERIALS CHARACTERIZATION: STRUCTURE, SPECTROSCOPY AND MICROSCOPY

August 18-23, 2025



Organized by Department of Basic Sciences



**Institute of Infrastructure, Technology,
Research and Management (IITRAM)**
(An Autonomous University established by Government of Gujarat)

About the Institute:

Institute of Infrastructure, Technology, Research And Management has been established by the Government of Gujarat as an Autonomous University and has been mandated to bring about significant change in Engineering Education with respect to Technical and Managerial knowledge in the area of Infrastructure. The objective of this Institute is to serve as a Center of excellence in Research and Teaching in all areas pertaining to Infrastructure, and the Institute has a vision of acquiring a status of National importance in Infrastructure and related areas.

IITRAM offers Bachelor and Master of Technology programs in Civil Engineering, Mechanical Engineering, and Electrical Engineering. The Institute also offers Ph.D. in various discipline in Physics, Chemistry, Mathematics, Computer, Civil, Electrical, Mechanical Engineering, Humanities and Social Sciences. The medium of instruction is English and the examination is also conducted in English.

About the Department of Basic Sciences

Department of Basic Sciences fosters a culture of curiosity, logic and rigour with moral and ethical values. Physics, Chemistry and Mathematics are major disciplines of the department that offer core and elective courses to undergraduate and PhD students. Department of Basic Sciences at IITRAM has a strong and dynamic research environment enabling our PhD students to learn and do impactful research in frontier areas of their work with the motivation and able guidance of faculty members. Our faculty are from diverse fields of research, including experimental and computational condensed matter physics, magnetism and superconductivity, ferroics and topological materials, energy conversion and storage materials, molecular magnets, organometallic compounds, porous and nanomaterials for applications from Physics and Chemistry disciplines.

About the Workshop

Comprehensive understanding of materials properties is vital for innovative design for new and improved applications. Macroscopic properties crucially depend on composition and structure; the crystal and micro-structure of materials. This six-day 2nd workshop will introduce the fundamental framework for diffraction, spectroscopy and imaging methods for structural and compositional characterization of materials. This workshop will be fruitful to those who are planning to use or using essential materials characterization tools such as x-ray diffraction for structural analysis, Uv-Vis spectroscopy for electronic and optical properties, IR and Raman spectroscopy for vibrational analysis, x-ray photoelectron and energy dispersive x-ray spectroscopy for compositional analysis, electron microscopies for microstructural and texture analysis, scanning probe microscopy for surface topography and microstructure.

The workshop will help understand the relation between structure and materials' properties essential for materials scientists and engineers, that expands the knowledge base in the field of Materials Characterization. For new researchers, this workshop can be a great opportunity to learn, explore and make lifelong collaborations.

The first 6 Days Workshop on "Materials Characterization: Structure, Spectroscopy and Microscopy" August 19-24, 2019 was attended by more than 80 participants, mostly PhD students and some early career scientists and academicians.

Topics

The following broad topics will be covered :

- Structure, symmetry and diffraction: theoretical framework
- X-ray diffraction: structural analysis by Rietveld Refinement
- Uv-Vis spectroscopy: electronic and optical properties
- Ultrafast Spectroscopy and Quantum Molecular Reactions

- IR and Raman spectroscopy: vibrational analysis
- X-ray photoelectron and energy dispersive x-ray spectroscopy for compositional analysis
- Raman and IR spectral mapping
- Scanning and transmission electron microscopies (SEM and TEM): theory of image formation, microstructural and texture analysis, possible artifacts
- Electron diffraction and defect analysis by TEM and SEM

Highlights

- Hands-on Rietveld refinement of powder x-ray diffraction patterns using Full-Prof software.
- Estimation of lattice parameters, atomic positions, bond length and angles, particle size, micro-strain, space group, etc.
- Hands-on data analysis, UV-Visible absorption for optical bandgap, FTIR and Raman spectra.
- Raman and IR modes identification of some selected materials and molecules.
- Detailed image analysis of electron microscopy and crystallographic texture.
- Indexing of electron diffraction patterns.

Patron:

- Prof. P. K. Jain, Director General, IITRAM
- Prof. M. K. Barua, Director, IITRAM

Mentor:

- Dr. Prakash Dabhi, Head, Basic Sciences, IITRAM

Important Dates:

- Registration Opens: April 24, 2025
- Registration closes: July 23, 2025
- Registration Fees: Rs. 3500/-
- Link : <https://iitram.in/workshop/index41/index.php>

For query contact: Dr. Brajesh Tiwari

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E-mail: brajeshtiwari@iitram.ac.in

Total Seats: 60 (First come first served basis)