

## About STUTI:

The Scheme 'Synergistic Training program Utilizing the Scientific and Technological Infrastructure' (STUTI) is intended to build human resource and its knowledge capacity through open access S&T Infrastructure across the country. As a complement to the various schemes of DST funding for expansion of R&D Infrastructure at academic institutions, STUTI scheme envisions a hands-on training program and sensitization of the state-of-the-art equipment as well as towards sharing while ensuring transparent access of S&T facilities.

## Instruments covered for training:

- ❖ Transmission Electron Microscope (TEM)
- ❖ Small Angle X-ray Scattering (SAXS)
- ❖ Physical Property Measurement System (PPMS)
- ❖ X-ray Photoelectron Spectroscopy (XPS)
- ❖ Time of Flight Secondary Mass Spectroscopy (TOF-SIMS)
- ❖ X-Ray Diffractometer (XRD)

**Equipment Name:** Transmission Electron Microscope (TEM)

**Make:** Jeol

**Model:** JEM-ARM200F NEOARM

### **Applications:**

1. Study of crystal structure
2. Defects study
3. Grain boundary study
4. Tomography
5. Electron Energy Loss Spectroscopy



**Equipment Name:** Small Angle X-ray Scattering (SAXS)

**Make:** Anton Paar

**Model:** SAXS point 2.0

### **Applications:**

1. nanoparticle (1-100 nm) size distributions
2. shape
3. pore sizes
4. particle density
5. inter particle distance of partially ordered materials
6. surface to volume ratio

+ **EquipmentName:** Physical Property Measurement System (PPMS)

+ **Make:** Cryogenic Ltd. (the UK)

+ **Model:** CFMS 14T

+ **Applications:**

1. Magnetic transport properties (M-T, M-H, ACS)
2. Electrical Transport Properties (Hall, MR, R-T, AC resistivity)
3. Thermal Transport properties (Seebeck Coefficient, Thermal conductivity, Heat capacity)



+ **Equipment Name:** X-ray Photoelectron Spectroscopy (XPS)

+ **Make:** Kratos Analytical Ltd

+ **Model:** AXIS Supra

+ **Applications:**

1. Insight into the chemical composition, elemental and chemical distribution of species, defect sites and functional groups
2. Surface chemistry of 2D materials and nanomaterials
3. Biomaterials
4. Catalysis
5. Thin films and multilayer films
6. Surface properties of wood, wood fibre and bio-polymer samples
7. Polymers and Battery materials



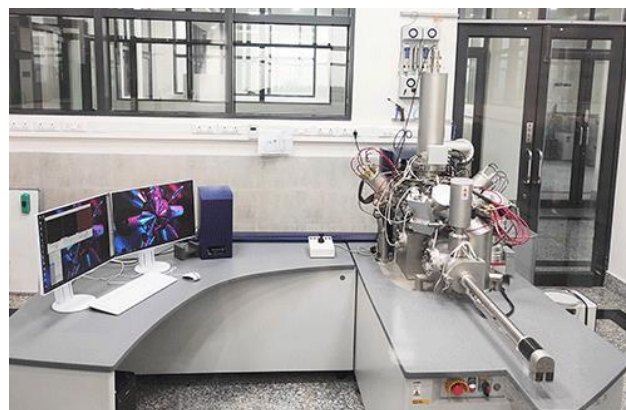
+ **Equipment Name:** Time of Flight Secondary Mass Spectroscopy (TOF-SIMS)

+ **Make:** IONTOF GmbH Germany

+ **Model:** TOF-SIMS 5

+ **Applications:**

1. Mass spectrum study of elements and organic materials
2. Mapping of elements and organic species on the surfaces
3. Composition & impurity measurements of thin films
4. Failure and root cause analysis of devices & materials
5. Dopant & impurity depth profiling.





+ **Equipment Name: X-ray Diffractometer**

+ **Make: Malvern PAN analytical**

+ **Model: Empyrean**

+ **Applications:**

1. Powder diffraction in either reflection or transmission geometries employing  $\theta/\theta$ .
2. Medium and high-resolution X-ray diffraction of Thin films including symmetrical, asymmetrical and grazing incidence diffraction, x-ray reflectivity, texture, stress, rocking curves, fast reciprocal lattice maps.
3. Medium and high-resolution X-ray diffraction studies of thin films and layered materials in the temperature range of 12 – 770 K (-261 – 500°C).