

## Electron Microscopy Workshop: A Two-Day Event

### Featuring Scanning Electron Microscopy and High-Resolution Transmission Electron Microscopy

Characterization is one of the very essential requirements of material research. PSG institute of Advanced Studies is equipped with state of the art facilities for nanomaterial synthesis, device fabrication and characterization.

#### High Resolution Transmission Electron Microscope facility:

The JEOL JEM-2100 High Resolution Transmission Electron Microscope (HRTEM) provides one of the best-in-class solutions to problems in diverse fields ranging from Materials Science to Biology. The instrument can be operated in several acceleration voltages according to the material requirement and is equipped with analysis techniques such as Bright Field (BF) and Dark Field (DF) imaging, High Resolution Imaging, Selected Area Electron Diffraction (SAED), Energy Dispersive X-ray Analysis (EDS), Nano Beam Diffraction (NBD) and Convergent Beam Electron Diffraction (CBED). The image recording is done with Gatan Orious CCD camera. The HRTEM facility is also equipped with sophisticated specimen preparation equipments to prepare TEM specimens.

#### Scanning Electron Microscope facility:

Scanning Electron Microscopy (SEM) is a non-destructive technique that uses an electron beam to analyze surface details down to the nano-scale. PSGIAS has Carl Zeiss EVO 18 Scanning Electron Microscope with low vacuum Gatan cryostage and EDAX energy dispersive spectrometer (EDS). This provides surface topography with a resolution of 200 nm, material composition and distribution of samples ranging from materials science to biology. It has secondary electron and backscattered electron detection systems along with energy-dispersive X-ray spectroscopy for elemental analysis and mapping.



**Zeiss EVO-18**

The SEM can operate at several acceleration voltages according to the material requirement and is equipped with various analysis techniques of imaging and composition analysis. The facility is also equipped with sophisticated specimen coating equipment for gold and palladium coating.

#### About the Workshop:

The main aim of two-day workshop on 19th and 20th August 2024 at PSG Institute of Advanced Studies is to bring awareness and enrich the understanding about Scanning Electron Microscopy & Transmission Electron Microscopy. The participants will be given a comprehensive understanding about the theory and various techniques involved in material characterization using SEM & HRTEM.

#### **The main activities of the workshop are listed below**

- Lecture on Electron Microscopy, Principles, methods of analysis.
- Invited lecture on Advanced Instrumentation and Techniques.
- Detailed demonstration of the Instruments and their usage.
- Demonstration on specimen preparation for biological and bulk sample
- Training and Insights for performing basic level interpretation of HR-TEM and SEM data using freely available softwares.



**JEOL JEM-2100**



**PSG INSTITUTE OF  
ADVANCED STUDIES**

**DEPARTMENT OF PHYSICS  
PSG INSTITUTE OF ADVANCED  
STUDIES,  
COIMBATORE.**

*Organises*

## **"Two-day Workshop on Electron Microscopy"**

**19th & 20th August 2024**



**PSG institute of Advanced Studies,  
Avinashi Road, Peelamedu,  
Coimbatore -641004.**

[www.psgias.ac.in](http://www.psgias.ac.in)

## Day 1

### Forenoon Session

Theory on Basic Principles, Instrumentation & Analysis techniques of HRTEM and SEM by Dr. Anuradha M Ashok

### Afternoon session

Data Analysis – Group A  
Demonstration for HR-TEM, SEM & Specimen Preparation – Group B

## Day 2

### Forenoon Session

Lecture on Advanced Analytical Electron Microscopy and Techniques by Dr. Arup Dasgupta

TEM Specimen preparation for Biological and Organic samples by Dr. Anuradha M Ashok

### Afternoon session

Data Analysis – Group B  
Demonstration for HR-TEM, SEM & Specimen Preparation – Group A

## Convenors

Dr. J. Kanchana  
Deputy Director,  
PSG IAS

Dr. Anuradha M Ashok  
Professor & Head,  
Department of Physics,  
PSGIAS

## Co-Convenors

Department of Physics

Dr. Geetha Priyadarshini B,  
Associate Professor

Dr. Abinash Das,  
Assistant Professor

Dr. Sebin Devasia ,  
Assistant Professor

## About the resource persons

Dr. Anuradha M Ashok, Professor & Head, Department of Physics at PSG Institute of Advanced Studies has expertise in various types, material characterization techniques, theory and data analysis in electron microscopy, X-Ray diffraction, crystallography, and analysis of structure-property relationships. Her research group at PSG IAS is working on development of functional materials and prototype devices for clean energy applications. She is currently in-charge of the electron microscopy and X-Ray diffraction facilities at PSG IAS and has been invited as a resource person to give lectures on these characterisation techniques in several programs.



## About the Invited speaker

Dr. Arup Dasgupta is a Scientific Officer 'H' at Indra Gandhi Centre for Atomic Research, Kalpakkam. He is leading Physical Metallurgy Division of Metallurgy and Materials group at IGCAR. In addition, he is also serving as Professor at Homi Bhabha National Institute. His areas of specification are the film photovoltaics and advanced electron microscopy. His academic journey, which began with a solid foundation in physics and materials science from IIT Kharagpur, led to a distinguished Ph.D. from Jadavpur University while working at the Indian Association for the Cultivation of Science (IACS) in Kolkata. His postdoctoral work at Forschungszentrum Juelich in Germany further honed his expertise, which he has been applying at the Indira Gandhi Centre for Atomic Research (IGCAR) since 2000.

Dr. Dasgupta's work with Ultra High Resolution Analytical Transmission Electron Microscopy (TEM) stands out as a testament to his dedication to advancing materials development and characterization. The state-of-the-art 300kV probe aberration corrected TEM equipped with advanced detectors has been pivotal in analyzing metallic and ceramic samples, contributing to the understanding of their structure-property relationships. His research has led to over 180 publications and three patents, showcasing his role as a leading figure in the scientific community.



The details of the programme and application form for participation are available in the website [www.psgias.ac.in](http://www.psgias.ac.in)

### Registration Fee

Rs. 1750/- (including 18% of GST) for students.  
Rs. 2250/- (including 18% of GST) for faculty members.  
Number of participants is restricted to 50.  
<https://forms.gle/AYZyJmtMmVb3XjHW7>

**Last date for registration is  
15th Aug 2024.**

Accommodation will be provided on payment and first come first reserve basis.

### Bank Account details

Name of the account	PSGIAS
Bank Name	Central Bank of India
Branch	Peelamedu, Coimbatore
Account no.	1481412317
IFSC Code	CBIN0280913
Account type	SB



Scan to register

## Contact Details:

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### For Queries:

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PSG IAS

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