National Applied R&D Centre

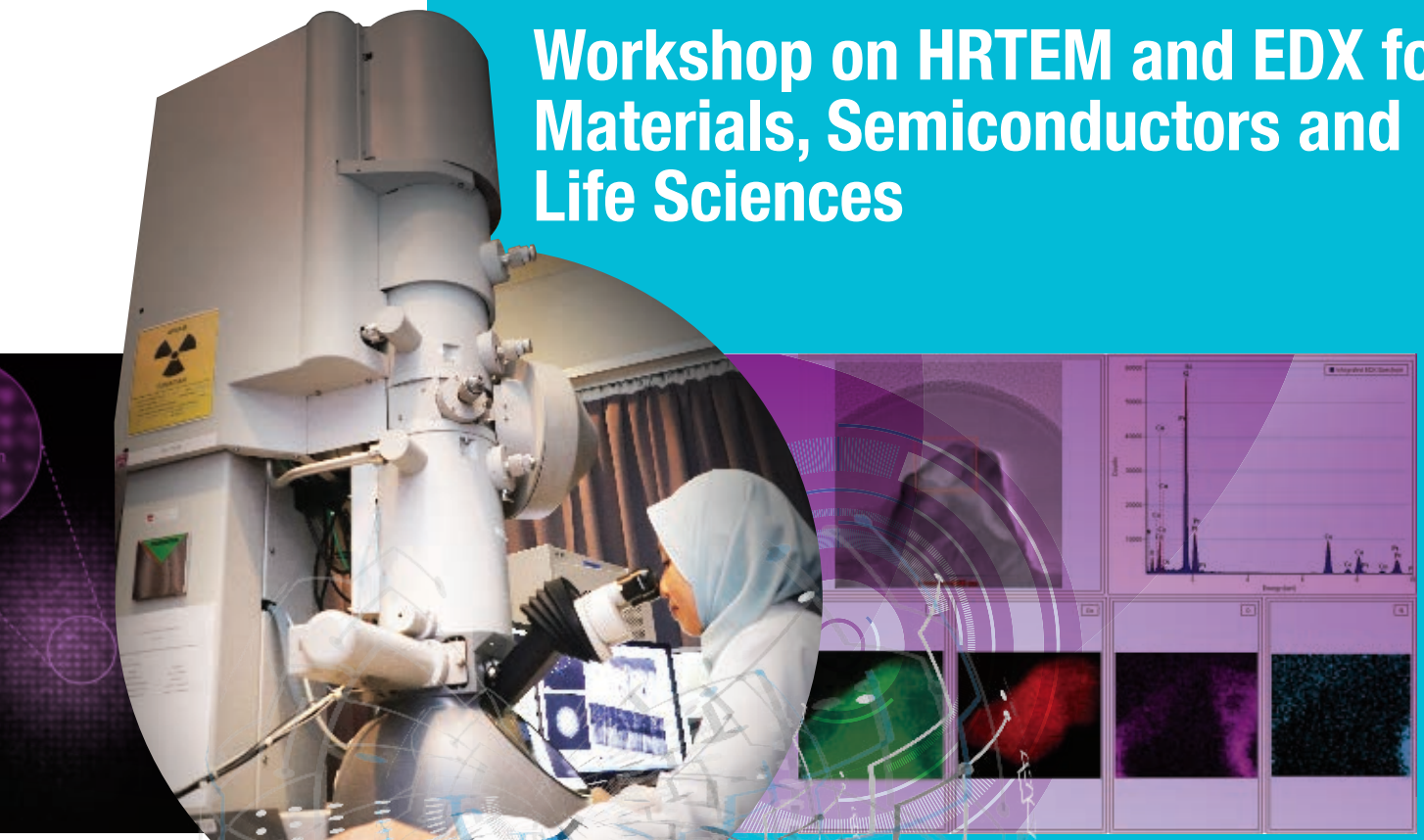
MIMOS

KEMENTERIAN TENAGA, SAINS, TEKNOLOGI, ALAM SEKITAR DAN PERUBAHAN IKLIM

UNIVERSITY OF MALAYA

The Leader in Research & Innovation

Workshop on HRTEM and EDX for Materials, Semiconductors and Life Sciences



12 - 13 NOVEMBER 2018

RM2900/PAX

EARLY BIRD BEFORE OR ON 31 OCTOBER 2018

Overview

Speakers will be sharing their fundamental knowledge of High Resolution Transmission Electron Microscopy (HRTEM) and Energy-Dispersive X-ray Spectroscopy (EDX) techniques. Sample preparation and application of HRTEM for different types of samples (materials, semiconductors, life science samples) will also be discussed in the workshop. In this workshop, participants will learn how to process the samples (hands-on session), up to optimizing the image under the HRTEM.

Target Group

Everyone who is currently doing materials, semiconductors or life sciences applications with HRTEM would find this course beneficial.

HRDF CLAIMABLE

Learning Outcome

Upon completion, participants should be able to demonstrate/understand each of the following:

In this course, participants will learn how to process the sample from scratch, up to optimising the image under the TEM for both materials, semiconductors and life sciences. Participant can expect practical hands-on sessions on how to process various types of materials and life sciences specimens and optimising the best TEM parameters. Moreover, the working principle of HRTEM, HADDF STEM, EDX will be shared with all participants.

Methodology

The workshop is divided into four categories:

- Knowledge sharing on theory/working principle of HRTEM, HADDF STEM and EDX
- Presenting TEM sample preparation methodology of materials, semiconductors and life sciences
- Demo on sample preparation for TEM samples (Materials, semiconductors and life sciences)
- Demo on HRTEM operation

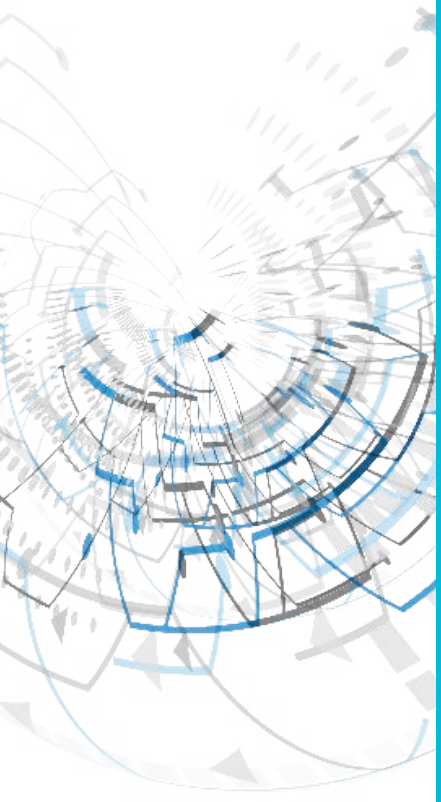
Pre-requisite

(Prior knowledge required to participate in this programme, if any)

Knowledge in semiconductor industry is an added advantage (EXAMPLE)

No prior experience with HRTEM or any sample preparation knowledge is needed for this course.

Outline/Contents



Day 1:

- Sample preparation and handling
  - Sample preparation of liquid/ powder sample
  - Cryo Ultra Microtome preparation
- TEM equipment set up
  - Sample loading and unloading
  - TEM alignment
- Eucentric Height
- Kukichi pattern
- Direct alignment
- HRTEM Imaging
  - Bright field HR imaging
- Objective aperture set up
- Optimizing beam intensity
- Optimizing focus and stigmator
- Capturing an image
- SAED Analysis
- SAED aperture setup
- Capturing SAED image

Day 2:

- STEM and EDS operation and data interpretation
  - Set up of STEM
  - Sample alignment
  - STEM imaging
  - Set up EDS Parameters
  - Acquire spectrum
- Spectrum collection
- Peak identification – all peaks are labelled
- Overlapped peak
- Quantification
  - EDS capabilities
- EDS point analysis
- EDS area analysis
- EDS line scan analysis
- EDS mapping analysis
  - Data interpretation

Instructor Profile

Dr Leo graduated with her PhD from Imperial College London (UK). Before her PhD studies, she worked as a R&D engineer in Infineon technologies (Advanced Logic) Sdn Bhd. Currently, she is serving as an electron microscopy service manager and consultant of the Central Unit of Advanced Research Imaging (CENTUARI, UM). Her research interest revolves around the characterization of nanomaterials, toxicology and corrosion studies using high-resolution analytical electron microscopes such as FIB-SEM, HRTEM, STEM-EDX, EELS. Besides, she has developed a workflow to map the spatial localization of nanomaterials and enzymes using a combination of TOF-SIMS, confocal microscopy and EM techniques. Dr Leo and her research group has established multiple electron microscopy project collaboration between UM, local universities and private industries in Malaysia, Imperial College London, Leeds University, Cardiff University and Diamond Light Source at Oxfordshire (UK). Many of her peer reviewed papers on the topics including: nanomaterials synthesis and characterisation, nanotoxicology, biosensors etc. have been published in high impact journals. Moreover, the first-authored paper 'The Stability of Silver Nanoparticles in a Model of Pulmonary Surfactant' that has been published in the ES&T and noted as a science highlight in the UK Diamond Light Source Annual review. Besides, Dr. Leo also serves as manuscript reviewer for scientific papers including New Journal of Chemistry, Scientific Reports (Nature), Aquatic Toxicology, RSC Advances and conference papers etc.

Siti Rahmah Esa received her bachelor's degree in Microelectronic Engineering from Universiti Malaysia Perlis (UNIMAP) in 2006 and Master in Science from University of Malaya (UM) in 2017. She has a very good industrial experience in the semiconductor industry. She was a Failure Analysis Engineer in Infineon Technologies Kulim from 2006 – 2013. During her experience as Failure Analysis Engineer, she has been exposed to physical failure analysis techniques and material analysis, such as Field Emission Scanning Electron Microscope (FESEM), Dual Beam, Transmission Electron Microscope (TEM), Energy Dispersive X-ray Spectroscopy (EDS), Electron Energy Loss Spectroscopy (EELS) and Auger Electron Spectroscopy (AES). In June 2013, she joined MIMOS Berhad as a Failure Analysis Engineer. In 2016, she became a Leader of Material Analysis Lab. She has an experience in going through the accreditation and sustaining of MIMOS Failure Analysis labs under ISO/IEC 17025. She is one of the approve signatories for Energy Dispersive X-ray Spectroscopy (EDS) of Dual Beam equipment. She has conducted a series of technical training for students and E&E engineers on the operation, techniques and application of Failure Analysis and Material Analysis Equipment. She is the key technical personnel of Dual Beam, Transmission Electron Microscope (TEM), Energy Dispersive X-ray Spectroscopy (EDS), Electron Energy Loss Spectroscopy (EELS), Auger Electron Spectroscopy (AES) and Time of Flight Secondary Ion Mass Spectrometry (ToF-SIMS).

Register Now!

(Limited seats available)

REGISTRATION FORM

Workshop on HRTEM and EDX for Materials, Semiconductors and Life Sciences

MIMOS @ Technology Park Malaysia

12 - 13 November 2018 (Early bird date 31 October 2018)

Please complete this form and fax or email to us

COURSE FEE (HRDF Malaysia claimable)	Fee per participant
☐ Standard Registration	RM 2,900.00
☐ Early Bird Registration	RM 2,700.00
☐ Group Discount (3 participants and above)	RM 2,500.00

No	PARTICIPANT DETAILS	CONTACT INFORMATION	MEAL PREFERENCE
1	Name: Designation:	Email: Mobile No.:	☐ Vegetarian ☐ Non-Vegetarian
2	Name: Designation:	Email: Mobile No.:	☐ Vegetarian ☐ Non-Vegetarian
3	Name: Designation:	Email: Mobile No.:	☐ Vegetarian ☐ Non-Vegetarian
4	Name: Designation:	Email: Mobile No.:	☐ Vegetarian ☐ Non-Vegetarian
5	Name: Designation:	Email: Mobile No.:	☐ Vegetarian ☐ Non-Vegetarian

Organisation : .....

Postal Address : .....

Tel: : ..... Fax: .....

Contact Person : ..... Position: .....

Email : .....

Signature and Company Stamp:

AUTHORISATION

I understand and agree to MIMOS Berhad terms and conditions (Signatory must be authorised to sign on behalf of the Organisation)

Name of the Authorised Person : .....

Position : ..... Date : .....

To Register & for More Information:

Business Development (MSSB), MIMOS Berhad

Call : +603-8995 5000 ext. 55279 (Fara)
55642 (Amy)

Email : faradaya.machmud@mimos.my
letchumy@mimos.my

Central Unit of Advanced Research Imaging (CENTURY, UM)

Dr. Leo Bey Fen

Email: beyfenleo@um.edu.my

Please complete this form and fax or email to us.

Refered by:

☐ MIMOS Berhad

☐ Central Unit of Advanced Research Imaging (CENTURY, UM)

Terms & Conditions:

1) Upon received of this registration form (MIMOS), we will invoice to the contact-person for payment processing.

2) Payment is required within 30 days upon receipt of the invoice. All payment must be received 7 working days prior to the training date. The fee shall includes luncheon, coffee/tea breaks and training materials.

3) Mode of Payment - **Crossed Cheque** or **Bank Transfer** to **MIMOS Semiconductor (M) Sdn Bhd**
Maybank Account : 51-441-340235-8

4) Cancellation or postponement - Must be in writing with reason:
   a. 10 days before course – No charge
   b. 4 days before course – 50% charge
   c. 2 days before course – 100% charge
   d. Replacement participant can be accepted at no additional charge

6) Our instructor(s) and topics are confirmed at the time of this print. However, circumstances beyond the control of theorganizers' may occur and MIMOS Berhad reserves the rights to alter or modify the advertised speakers/ topics if necessary.

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