



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

Malaysia-Japan  
International  
Institute of Technology  
(MJIIT)



# MJIIT MICROSCOPY LABORATORY WORKSHOP SERIES – 2: FESEM & STEM

22<sup>nd</sup> March 2018

### Lecture

- Relationship between creep deformation and microstructure of heat-resistant alloys
- Dislocation structure observation by SEM electron channelling contrast imaging.

### Demonstration

- Application of channeling contrast to dislocations in materials.

23<sup>rd</sup> March 2018

### Lecture

- Ultramicroscopy for advanced materials in Kyushu University,
- Recent development in imaging and analysis techniques with electron beam scanning in TEM

### Demonstration

- STEM technique for observation of dark field images

26-27<sup>th</sup> March 2018

### Lecture

- Basic TEM and STEM
- Practical operation of STEM
- Application of STEM to characterization of materials.

### Demonstration

- TEM and STEM (intermediate level)
- Practical observation of STEM.

### Hands-on

- Practical observation and analysis with STEM

RM50\*

RM100\*

RM1000\*

\*Price is GST Inclusive. All registration payment is **NON-REFUNDABLE**



Registration Link:

<https://goo.gl/ETFR3K>

Last Day for Registration &  
Payment: 20<sup>th</sup> Mar 2018



### **For Further Information:**

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**DETAILS WILL BE ANNOUNCED SOON**



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MJIIT MICROSCOPY LABORATORY

**WORKSHOP SERIES-2  
(FESEM & STEM)**

Date & Time

22nd March (Thu) afternoon <1> FESEM  
 23rd March (Fri) morning <2> STEM  
 26th March (Mon) full day  
 27th March (Tue) morning } <2> STEM –  
 Hands-on

<1> Advanced Observation Techniques  
of FESEM for Microstructure in  
Deformed Materials

<2> Advanced Observation Techniques  
of STEM for Microstructure in  
Practical Materials

Venue

Microscopy Laboratory , MJIT, UTM-KL  
(Jalan Sultan Yahya Petra, 50400 Kuala Lumpur)

The venue for lecture is subject to change.

Date	Time	Code	Contents	Fee
22 <sup>nd</sup> March (Thu)	14:00 14:10		Opening address	
	14:10 15:00	<1>-1	Lecture (Dr. Yamasaki, Kyushu Univ., Japan) ➤ “Relationship between Creep Deformation and Microstructure of Heat-Resistant Alloys” ➤ “Dislocation Structure Observation by FESEM	Free
	15:00 17:00	<1> -2	Demonstration (Dr. Yamasaki, Kyushu Univ., Japan) ➤ Application of Channeling Contrast to Dislocations	RM 50
23 <sup>rd</sup> March (Fri)	09:00 10:00	<2> -1	Lecture (Prof. Dr. Hata, Kyushu Univ., Japan) ➤ “Ultramicroscopy for Advanced Materials in Kyushu University” ➤ “Recent Development in Imaging and Analysis Techniques with Electron BEAM Scanning in STEM	Free
	10:00 13:00	<2> -2	Demonstration (Prof. Dr. Hata, Kyushu University) > STEM Technique for Observation of Dark-Field Images	RM 100
26 <sup>th</sup> March (Mon)	10:00  (Lunch) 16:30	<2> -3	Greeting Address Lecture (Prof. Dr. Hata, Kyushu Univ., Japan) ➤ Basics of TEM and STEM ➤ Practical Operation of STEM ➤ Application of STEM to Characterization	RM 1,000
27 <sup>th</sup> March (Tue)	10:00  12:30		Demonstration and hands-on Training (Prof. Dr. Hata, Kyushu Univ. & Dr. Oikawa ,JEOL) ➤ Practical Operation of STEM ➤ Practical Analysis with STEM	
	12:30 13:00 Lunch		Closing: Certificate-award , Photo session	

# Are you using SEM and STEM well?

If you consider that SEM (Scanning Electron Microscope) is a tool for observing an external shape of sample and/or STEM (Scanning Transmission Electron Microscope) is just a tool for observing a rather thick samples, you are wrong. Nowadays, SEM and STEM have been developed notably in terms of hardware as well as theories of image-formation. We can observe single dislocations inside a materials by using FESEM instead of TEM. We can observe dark-field images by using STEM instead of selected-area -imaging of conventional TEM.

Prof. Dr. Satoshi Hata and Dr. Shigeto Yamasaki (Graduate School of Engineering Sciences and Ultramicroscopy Research Center, Kyushu University, Japan) will visit MJIIT by invitation of MJIIT, Microscopy Laboratory and *i-Kohza* of Nano-Characterization (Nano3) in this March. They are experts of nano/micro-characterization of materials, and have rich experiences of application of FEM and STEM. Then Microscopy Laboratory of MJIIT and *i-Kohza* of Nano3 will organize a workshop to provide a good opportunity for you to witness the novel techniques of FESEM and STEM.

## Registration Fee

No	Date	Contents	Fee (GST inclusive)
<1>-1	22 March	Presentation/Lecture	Free
<1>-2	22 March	Demonstration (FESEM)	RM50
<2>-1	23 March	Presentation/Lecture	Free
<2>-2	23 March	Demonstration (STEM)	RM100
<2>-3	26-27 March	Lecture & hands-on (STEM)	RM1,000

You can select sessions for registration separately as you like. Even if you select sessions free o charge, you are requested to make registration in order to figure out the number of participants.

**Register at Google Form**  
<https://goo.gl/ETFR3K>

Last day for registration:  
20th Mar 2018

For further information  
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