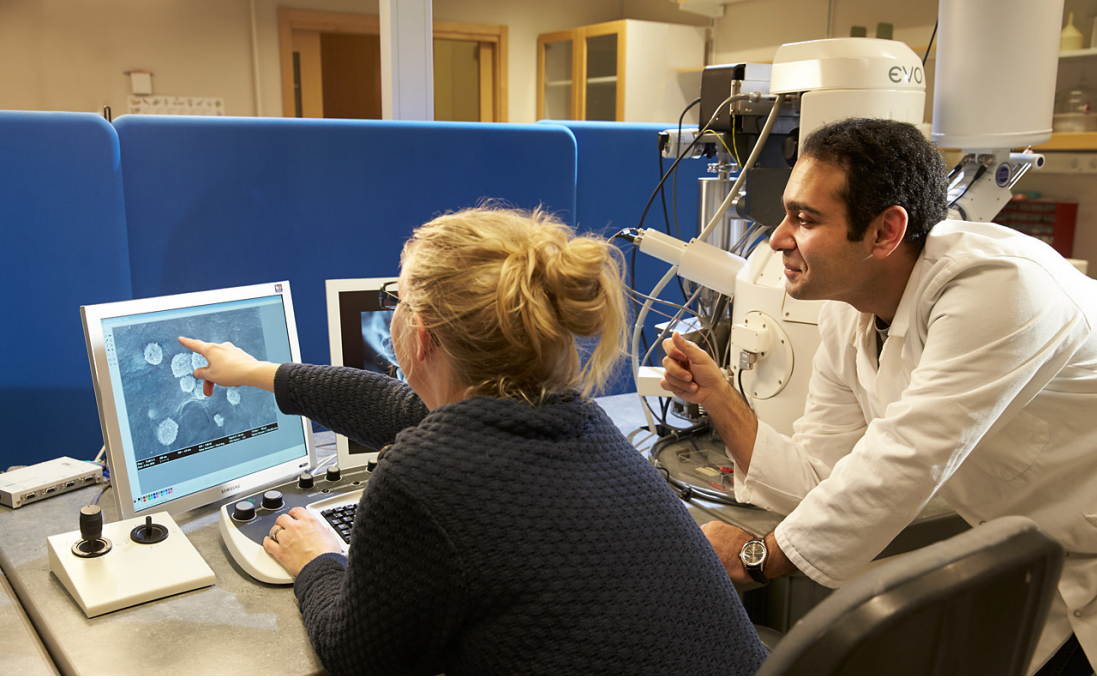

MILAB Workshop

Program

08:30 – 09:15	**Coffee and registration House O, O111**
09:15 – 09:30	MILAB Introduction
09:30 – 10:30	Talk: Horiba Raman Microscopy
10:30 – 11:30	Talk: Oxford Instruments, Low voltage EDS and advantages of WDS detectors over EDS
11:30 – 12:00	Talk: Tescan, electron microscopy with CL-detectors
12:00 – 13:00	**Lunch and poster session FSCN research centre House S** Bring your own posters or company presentations
13: 00 – 17:00	**Parallel demonstration sessions** - Raman Microscopy - SEM – CL - Low-voltage EDS

Welcome!
Magnus Hummelgård
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Region Västernorrland
KK-stiftelsen
EUROPEISKA UNIONEN
Europeiska regionala utvecklingsfonden
Mittuniversitetet
MID SWEDEN UNIVERSITY

As a continuation of the launch of the Material Innovations Laboratory (MILAB) at Mid Sweden University a dedicated laboratory workshop with focus on scientific equipment will be held on yearly basis. Each workshop will have a dedicated theme and this year's topic is scientific equipment related to optical techniques or research. Suppliers from Horiba, Oxford Instruments and Tescan will give presentations and parallel demonstration sessions during the afternoon. There will also be topics on low-voltage techniques in electron microscopy (SEM) together with a SEM-school 'light' hands-on training.

Talk: Horiba Raman Microscopy
The optical inelastic scattering response, raman-scattering, gives characteristic information from bonding and structure of materials, a close relative to this technique is perhaps the more commonly known IR-spectroscopy. Here this raman-technique is combined with an optical microscopy system that brings together these characteristics of the material with a highly resolved lateral position of the sample. That is the method gives answer to what and where at the same time sort of.

Talk: Oxford Instruments, Low voltage EDS and advantages of WDS detectors over EDS
Energy dispersive Spectroscopy a standard technique for elemental analysis in electron microscopy. Normally this is done at high accelerating voltage of the electron microscope. Research needs of lower accelerating voltage has also brought altered usage of EDS. This talk will be about advantages and drawbacks of low-voltage techniques in EDS-work. Also, WDS, wavelength dispersive spectroscopy, an alternative technique for elemental analysis will be mentioned in the context.

Talk: Tescan, electron microscopy with CL-detectors
General talk on detectorsystems for scanning electron microscopy (SEM) with Cathode Luminescence Cathode Luminescence (SEM-CL) detectors applications. This talk will be both a general talk about special techniques/detectors ad-on's for SEM such as CL-detectors, but also FIB (focused ion beam) and other advanced techniques will be mentioned. One of the advantages of combining cathode luminescence with electron microscopy is the high lateral resolution in the range of nanometers. Band-gap of semiconductors, plasmon-resonance of nanoparticles, optical active material as fiber optics could be studied with cathode luminescence techniques.

Lunch and poster session FSCN research centre
Lunch will be a buffet and there's room for interaction among the workshop visitors. One goal of the workshop is to bring people together from diverse backgrounds but sharing some common needs. Visitors are therefore suggested to bring posters from there currently ongoing research, company roll-ups or similar for the poster-session.

Raman Microscopy
Demonstration of the newly invested raman microscope Xplora plus from Horiba will be made. Both general demonstrations of the capabilities of this type of technique were raman is combined with microscopy as well the special features of this particular machine will be shown.

SEM – CL
Cathode Luminescence in scanning electron microscopy will be demonstrated. For the day Tescan brings a demo-detector to show the advantages of this technique combination, its capabilities and limitations. The detector used will be a panchromatic compact CL version.

Low-voltage EDS
EDS is a standard technique for atomic elemental composition studies done together with electron microscopy, traditionally this is conducted at high accelerating voltages settings of the microscope, however there is an ongoing trend of reducing the voltage levels and it's mainly driven by new demands of new types of materials being examined. EDS at lower voltages do bring many challenges and here we demonstrate how low-voltage EDS operation in scanning electron microscopy is achieved, its capabilities, drawbacks and hints for best usage.

SEM-school
This is a dedicated SEM-school in mini-format. Insight on low-voltage operation, although these kinds of techniques exist in one form or another on different brands of instruments. The main purpose and best usage of this SEM-school will be for users that uses or plan to use the microscopy-facilities at MILAB and have need for low-voltage operation, that is extreme surface studies, sensitive soft-material samples etc.

Program MILAB workshop, April 26th 2018

Although given great interest in attending SEM-school we had to restrict this session to only external visitors due to limited resources. The announced program included a dinner session this was however canceled due to too few participants.

The parallel sessions during afternoon is split into four groups, depending on your interest you have been assigned one of the groups. Group 1 are for those only interested in raman. Group 2 for those with interest in SEM-CL and raman. Group 3 gives sessions for all techniques. Group 4 sessions with all techniques and SEM-school.

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12:00-13:00	LUNCH & Poster session FSCN research centre			
Parallel Sessions	Group 1 (raman)	Group 2 (sem-cl)	Group 3 (low-EDS)	Group 4 (school)
13:00-13:30	Raman group 1a	SEM-CL	poster session FSCN research centre	
13:30-14:00		Raman	low-EDS	SEM-school pt 1
14:00-14:30			Raman	low-EDS
14:30-15:00	coffebreak/poster session FSCN research centre			
15:00-15:30			SEM-CL	Raman
15:30-16:00	Raman group 1b			SEM-CL
16:00-17:00				SEM-school pt II
17:00	End			


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