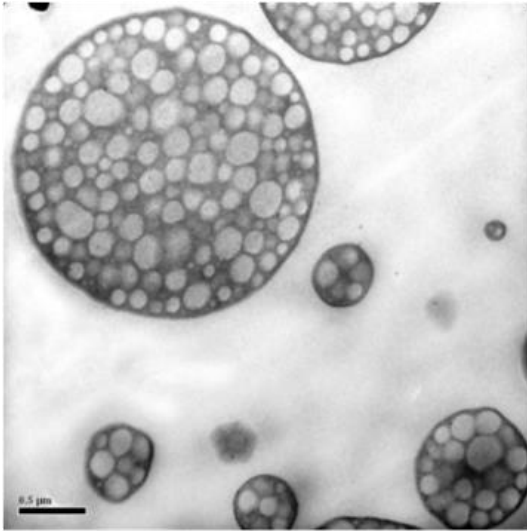


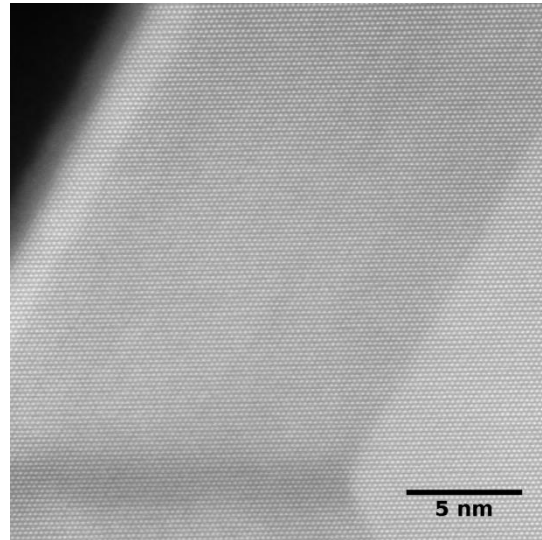
# EMS MICROSCOPY ACADEMY

## MATERIALS ULTRAMICROTOMY WORKSHOP

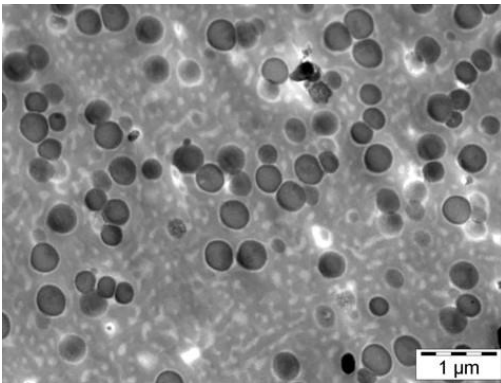
*Examples of the endless possibilities when doing materials microtomy*



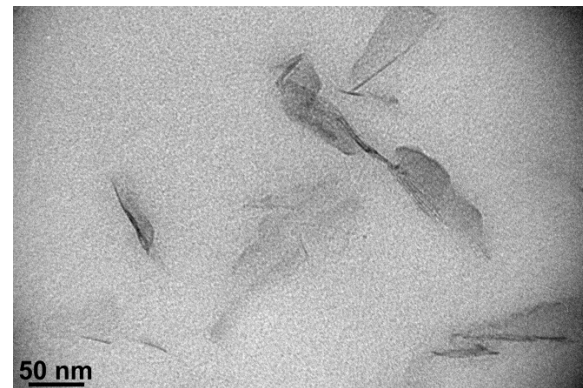
High Impact Polystyrene.  
Claudia Maymofer, TU Graz



GaAs-AlGaAs nanowires grown epitaxially on Si Substrate. Resin embedded and sectioned with a ultra 35 Degree diamond knife; HAADF-STEM. Hanne Kauko, Dept of Physics Trondheim



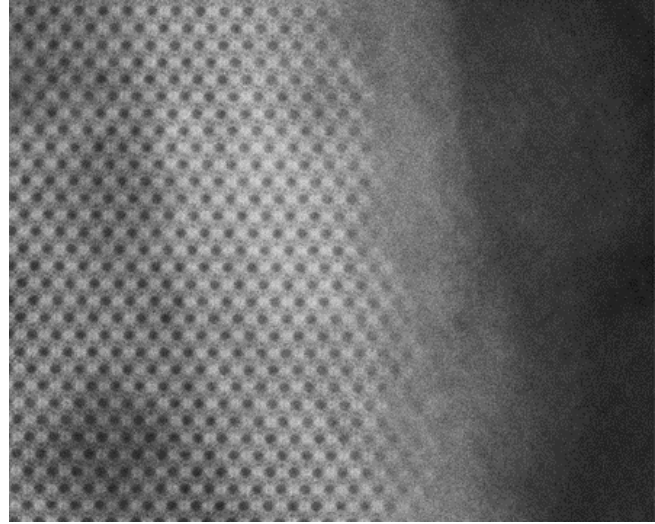
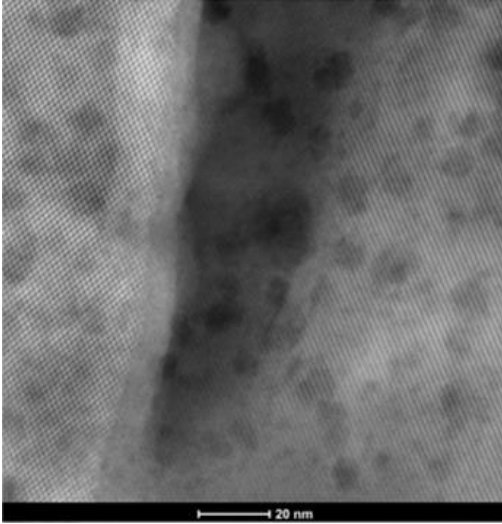
Polycarbonate modified with rubber.  
Jens Sicking, Bayer Technology Services,  
Leverkusen



Polypropylene with montmorillonite clay nanoparticles. Sectioning with the DiATOME Ultrasonic Knife.

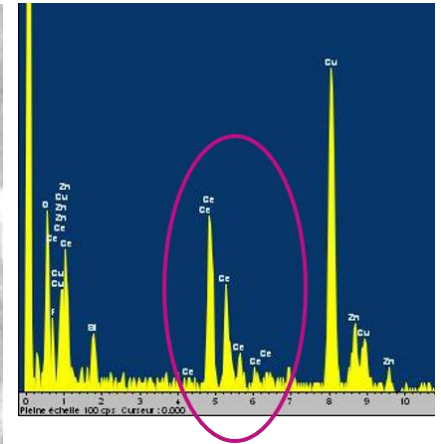
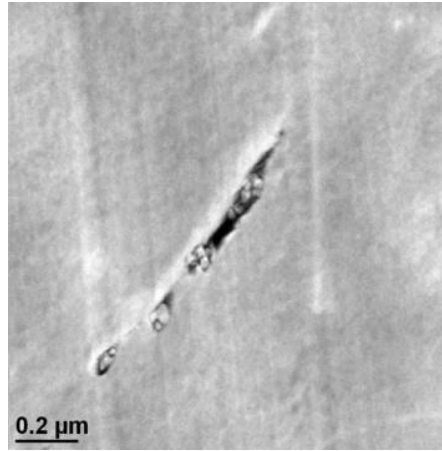
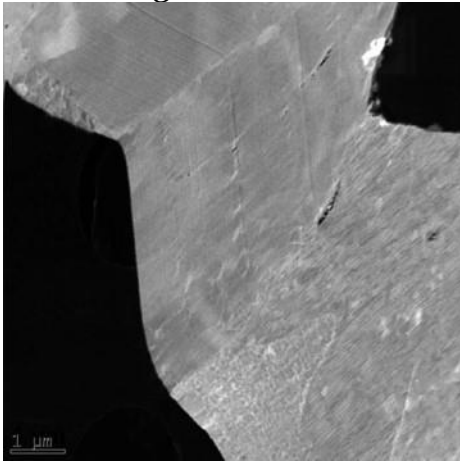
# EMS MICROSCOPY ACADEMY MATERIALS ULTRAMICROTOMY WORKSHOP

## *Sectioning Brittle Samples*



Zeolite USY30 Crystal morphology STEM Analysis. The Mesopores (2-50 nm) (left) and the Crystalline micropores (0.7 nm) (right) are clearly visualized.  
Tom Wilhammar, Sara Bals EMAT, Antwerp

## *Sectioning Metals*



Cerium inclusions in a zinc coating.  
Philippe Steyer and Emile Calvie INSA, Lyon

EDS spectra showing the cerium peak.

# **EMS MICROSCOPY ACADEMY**

## **MATERIALS ULTRAMICROTOMY WORKSHOP**

Three days of hands-on training for technicians, researchers, and students who want to apply a faster and cleaner preparation method that provides samples with uniform thickness, no embedded contamination, and is cheaper than a FIB.

### **Details**

Monday\*

September 21, 2020 (for Beginners)

Tuesday - Thursday

September 22 - 24, 2020 (for All)

8:30 a.m. - 4:30 p.m.

Hatfield, Pennsylvania, USA

### **Facility**

#### **The EMS Microscopy Academy**

Located in Hatfield, Pennsylvania, the Academy provides electron microscopy classes, workshops and training sessions for all fields of microscopy, including materials science and biological science.

### **Faculty**

**Helmut Gnaegi**, Diatome Ltd., Switzerland

Helmut's background is in engineering and is one of the founders of Diatome, the leading supplier of diamond knives and related accessories, such as ionizers and manipulators, etc. He is also one of the leading instructors for ultramicrotomy courses (Biological and Materials) around the world.

**Michael Kostrna** was the program director of the Electron Microscopy Technician program at Madison Area Technical College and has more than 35 years in EM technical education and research experience. He has been training EM students for 30 years and has developed curricula and lab exercises for TEM, SEM, OLM, lab safety, introductory and advanced biological EM, EM, maintenance, and x-Ray microanalysis. He has worked with companies such as SC Johnson Polymer, Dow Chemicals, Io Genetics, Virent Technologies, ABS Global, NanoOnocology, and Microscopy Innovations, and in the process gained insight to the various applications of EM.

**Al Coritz** has been working in the Electron Microscopy field for 39 years, beginning at the Yale School of Medicine and ending up on the commercial side with several key EM companies. His specialty is Cryo-techniques and Thin Film Technology: i.e. Freeze Fracture/Rotary Shadowing, High Pressure Freezing, and more. He is currently with Electron Microscopy Sciences where he has been the Technical Director for over 20 years.

# **EMS MICROSCOPY ACADEMY**

## **MATERIALS ULTRAMICROTOMY WORKSHOP**

### **Scope of class**

Introduce individuals to the unique application of ultramicrotomy to materials, which provides several advantages over other common techniques, such as ion milling, FIB, and tripod polishing for TEM analysis. The thin ( $\leq 30$  nm) sectioning of metals, embedded powders, and polymers is a technique that provides samples with a uniform thickness, retention of elemental distribution, lack of ion implantation contamination, and proves to be much faster than other preparation methods such as ion milling, tripod polishing and FIB milling.

### **Format**

Lecture demonstration and hands-on practice as well as round table discussion. Participants may bring their own samples to work on during lab time.

### **Main Curriculum**

Sample discussion/evaluation to determine method of support.  
Embedment in Epofix or Cyanoacrylate glue if necessary  
Trimming using razor blades, diamond trim blades or the TXP for precision trimming  
Sectioning of brittle materials and brittle water sensitive materials at room temperature  
Sectioning polymers at room temperature using ultra sonic knife  
Cryo trimming and sectioning softer polymers  
OsO<sub>4</sub> and RuO<sub>4</sub> staining of sectioned polymers

### **Instruments Available**

<b>Leica UC7</b>	<b>Leica TXP</b>	<b>Diatome Ultrasonic</b>
<b>Boeckler Autotome</b>	<b>DM4</b>	<b>Diatome Diamond Knives</b>

### **Schedule**

*\*Monday, September 21, 2020*

Monday's class is for individuals who are unfamiliar with microtomy. This day will be spent covering microtomy basics to prepare the individual for the advanced materials portion of the workshop.

*Tuesday, September 22, 2020*

8:30-9:00 Introduction of staff and participants  
9:00-10:00 Introduction to room temperature microtomy and ultramicrotome instrument  
10:00-10:30 Break  
10:30-11:30 Introduction to cryo temperature ultramicrotomy (Polymers)  
11:30-12:30 Leica TXP and other trimming methods  
12:30-1:00 Provided lunch  
1:00-2:00 Demo embedment/trimming  
2:00-4:30 Individual embedment and trimming, (Demo RT sectioning)?  
6.00 p.m. Host Dinner

# **EMS MICROSCOPY ACADEMY**

## **MATERIALS ULTRAMICROTOMY WORKSHOP**

*Wednesday, September 23, 2020*

8:30-9:00 Debrief on previous day's activities  
9:00-10:00 Demo room temperature sectioning and checking under OLM  
10:00-10:30 Break  
10:30-12:00 Finish individual trimming, begin sectioning  
12:00-12:30 Provided lunch  
12:30- 4:30 Individual RT microtomy

*Thursday, September 24, 2020*

8:30-9:00 Roundtable discussion of previous days activities  
9:00-9:30 Demonstration of cryo temperature microtomy  
9:30-12:00 Individual cryo and RT ultramicrotomy  
12:00-12:30 Provided lunch  
12:20-1:30 Staining of polymers  
1:30-4:30 Individual activities

***Schedule subject to change***

### **Lodging**

Participants are responsible for making their own hotel reservations.  
The following hotel has been designated as the host hotel:

#### **Homewood Suites**

1200 Pennbrook Parkway  
Lansdale, PA 19446  
Phone: 215-362-6400

The special rates are \$119.00 per night (plus tax) which includes a hot breakfast and a light dinner in the evening.

Please make your reservations and mention you are participating in the EMS Workshop.  
GROUP CODE: EMS WORKSHOP

Everyone should plan to arrive the night before class begins.

### **Enrollment Note**

Registration will be limited to a maximum of 15 participants.  
EMS/DiATOME will provide samples to those who prefer not to bring their own.

### **Registration Fee \$1,200.00 Includes**

A workshop syllabus, all supplies, reagents and solutions, lunches, coffee, tea, and dinner on the opening evening of the workshop.

**EMS MICROSCOPY ACADEMY**  
**MATERIALS ULTRAMICROTOMY WORKSHOP**

**PRINTABLE REGISTRATION FORM**

\_\_\_\_\_ M / F  
Name / Title

\_\_\_\_\_  
Institution

\_\_\_\_\_  
Department

\_\_\_\_\_  
Mailing address

\_\_\_\_\_  
City / Zip

\_\_\_\_\_  
Country

\_\_\_\_\_  
Telephone / Fax

\_\_\_\_\_  
E-Mail

Will you bring your own specimens? Yes\_ / No\_ (See note on prior page)  
What samples are you bringing and most interested in?

\_\_\_\_\_

All registrations must include payment.

Rate \$1,200.00 per person \_\_\_\_\_

Number of participants \_\_\_\_\_

Total \$ \_\_\_\_\_

Pay by check: make payable to EMS and reference "Materials Workshop Sep20".

Pay by credit card: Credit Card Type \_\_\_\_\_

Credit Card Number \_\_\_\_\_

Exp Date \_\_\_\_\_ 3 Digit Code \_\_\_\_\_

\_\_\_\_\_  
Signature / Date

Return your registration to:

Stacie Kirsch

1560 Industry Road

Hatfield, PA 19440 USA

Phone: 215-412-8402

E-Mail: [info@emsdiasum.com](mailto:info@emsdiasum.com) or Fax: 215-412-8452

**TO REGISTER ONLINE, CLICK [HERE](#).**