



The spring, 2015 courses are each two-day intensives, and will take place in the greater Boston area. Each course mixes lecture with labwork on the basics of atomic force microscopy and its specific application to either imaging polymer materials or nanoparticles. Students will have hands-on instrument time with AFMs from AFMWorkshop, but the techniques learned will be applicable to any make or model of AFM.

AFMWorkshop announces TWO EXCITING NEW APPLICATION-ORIENTED AFM COURSES

Taught by *Dalia Yablon, Ph.D.*

In April, 2015, AFMWorkshop is pleased to offer two new application-oriented Atomic Force Microscopy (AFM) courses: **AFM for Characterization of Polymer Materials**, and **AFM for Characterization of Nanoparticles**. The courses will be taught by Dalia Yablon, Ph.D., an expert in AFM operation and applications from SurfaceChar LLC.

Class size is limited to 10 students. The price for each two day class is:

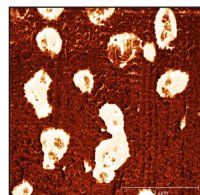
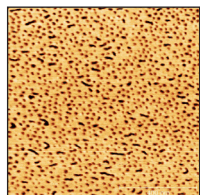
■ **\$1495*** before April 1st

■ **\$1750*** after April 1st

TAKE BOTH COURSES AND SAVE!

■ **\$2500*** before April 1st ; **\$3000*** after April 1st

(* includes lunch)



Topics to be covered:

- Overview of AFM operation and different modes
- Polymer sample preparation
- Overview of AFM hardware
- Overview of AFM software and image processing
- Imaging artifacts and best practices
- Tapping mode and phase imaging for best contrast of polymers
- Imaging mechanical properties of polymers
- Force spectroscopy and associated mechanical measurements of polymers
- Common models to interpret force distance curves
- Hybrid AFM-spectroscopy characterization (Raman and IR)

Labwork:

- Scanning standard and reference samples
- Polymer blends and films imaging
- Polymer blends image processing
- AFM calibration

▶ **Atomic Force Microscopy for Characterization of Polymer Materials**

April 27-28, 2015 | Norwood, Massachusetts

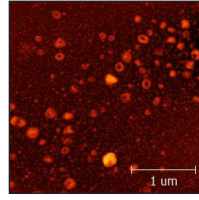
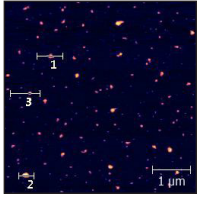
For polymer applications, Atomic Force Microscopy (AFM) now resides alongside optical microscopy and electron microscopy as an essential tool for nanoscale characterization of polymer structure, morphology, and material properties.

The Atomic Force Microscope provides several important advantages over other microscopy methods, including an unmatched ability to provide contrast with minimal sample preparation. Additionally, because the AFM operates through a mechanical interaction between the tip and sample, it provides unparalleled material-based contrast together with the ability to measure mechanical properties such as stiffness and adhesion on the nanoscale in many polymer materials.

The ability to discriminate materials based on their mechanical properties, coupled with nanometer lateral resolution, makes AFM the method of choice to characterize a variety of polymer materials including blends and composites.

This AFMWorkshop two day course mixes lecture with labwork on the basics of atomic force microscopy and its specific application to imaging polymer materials. AFM hardware and software will be reviewed, with special emphasis on the imaging modes and image processing needed to study polymer materials. While we utilize AFMs from AFMWorkshop to teach basic concepts and demonstrate AFM operation, attendees with experience on any make or model of Atomic Force Microscope will find the labwork relevant and practical.





▶ Atomic Force Microscopy to Characterize Nanoparticles

April 29-30, 2015 | Norwood, Massachusetts

The Atomic Force Microscope (AFM) allows for 3D characterization of nanoparticles with sub-nanometer resolution. Nanoparticle characterization using Atomic Force Microscopy has a number of advantages over dynamic light scattering, electron microscopy and optical characterization methods. The AFM provides powerful information on size, distribution, and geometries of nanoparticles.

Topics to be covered:

- Overview of AFM operation and different modes
- Nanoscale resolution
- Overview of AFM hardware
- Overview of AFM software
- Imaging modes for nanoparticles
- Topography measurements on nanoparticles
- Imaging artifacts and best practices
- Image processing for important measurements on nanoparticles

Labwork:

- Scanning standard and reference samples
- Nanoparticle imaging and image processing
- AFM calibration

Some of the unique advantages of nanoparticle characterization with an AFM include:

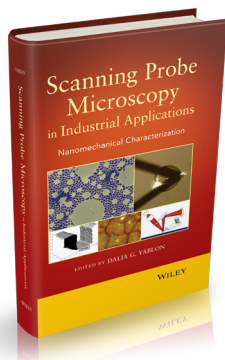
- Characterization of nanoparticles that are .5 nm and up.
- Nanoparticle mixture distributions below 30 nm.
- Characterization of variable geometry nanoparticles.
- Direct visualization of hydrated nanoparticles/liquid medium.
- Characterization of nanoparticle physical properties such as magnetic fields.

This two day AFMWorkshop course mixes lecture with labwork on atomic force microscopy operation specifically as it applies to characterizing nanoparticles. AFM hardware and software will be reviewed, with special emphasis on the imaging modes and image processing needed to study nanoparticles. We will utilize AFMs from AFMWorkshop to teach basic concepts and demonstrate AFM operation, however attendees with experience on any make of AFM instrument will find the labwork relevant and practical.



Dalia Yablon Ph.D. is a physical chemist with 15 years of experience in the field of scanning probe microscopy (SPM). Dalia's 2013 book **Scanning Probe Microscopy in Industrial Applications: Nanomechanical Characterization** was published by Wiley. Dr. Yablon spent over a decade in the energy industry developing and leading a state of the art scanning probe microscopy/nanomechanical characterization facility at ExxonMobil Corporation's flagship R&D center in New Jersey. During this time, she developed and applied SPM methods to characterize, conduct failure analysis, and probe structure-property relationships across various sectors of ExxonMobil's business including polymers, tribology, corrosion, geochemistry, and metallurgy. In 2013, Dalia founded SurfaceChar LLC, a scientific consulting company in the greater Boston area specializing in surface and interface characterization and measurement with a focus on scanning probe microscopy/atomic force microscopy.

Dr. Yablon holds an A.B. in Chemistry from Harvard University and a Ph.D. in physical chemistry from Columbia University.



TO REGISTER **Contact AFMWorkshop**
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