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# Workshop #1: Advanced Topics in Single Particle Cryo-EM & Cryo-ET

This workshop is no longer taking registrations as it is fully booked.

Date/Time	Friday, July 7, 2023 @ 9:00 AM ET	Registration Fees
Location	Laurel ABCD	Regular: \$50 Per Person Retired: \$50 Per Person PostDoc: \$50 Per Person Student: \$50 Per Person
Max Capacity	50	
Main Contact	<a href="#">Michael Cianfrocco</a>	

## Description

Cryo-electron microscopy (cryo-EM) is rapidly becoming the method of choice for structure determination of dynamic proteins, large macromolecular assemblies, and multi-protein complexes in vitro and in situ. This powerful technique is now capable of resolving biological specimens to better than 2 Å resolution and has been used to solve high-resolution structures of specimens as small as ~50 kilodaltons and ribosomes within cells. Cryo-EM instrumentation is being installed in many universities across the globe and is also available at large multi-user facilities both in the U.S. and worldwide. However, many practical aspects of cryo-EM are not covered in literature or research talks. We believe that this one-day workshop will cover many of the salient practical issues in single particle and cryo-electron tomography.

We will host a day-long workshop focusing on single particle cryo-EM and cryo-electron tomography (cryo-ET). In the morning, Dr. Cianfrocco will organize a workshop in single particle cryo-EM that will include lectures and panel discussions with leading experts. Topics will include identifying and dealing with challenging sample preparations, addressing or leveraging sample heterogeneity for structural biology, and validating 3D reconstructions.

Dr. Ho will organize an afternoon-long workshop focused on Cryo-ET. Cellular Cryo-ET is a burgeoning area of the field, with new, often transformational hardware and software advancements occurring on a monthly basis. This year's Advanced Topics in Cryo-ET Workshop is designed to provide scientists currently engaging in Cryo-ET research or scientists with a background in single-particle Cryo-EM who are interested in Cryo-ET with detailed coverage of the current status of the field and highlight major bottlenecks in Cryo-ET, with a particular focus on achieving sub-nanometer resolutions in cellular tomography. Lectures will focus on the major areas that are currently under active development in the field, from specimen preparation and tilt-series collection through to tomographic reconstruction, denoising, subtomogram averaged reconstruction, and segmentation.

## Schedule\*

Time	Instructor/Topic
9:00 AM - 9:15 AM ET	Michael Cianfrocco - Welcome & Introduction
9:15 AM - 12:00 PM ET	Lectures and discussions topics: <ul style="list-style-type: none"> <li>• How to identify and deal with challenging sample preparations</li> <li>• How to address or leverage sample heterogeneity for structural biology</li> <li>• Validation of 3D reconstructions.</li> </ul>
12:00 PM - 1:00 PM ET	Lunch (on your own)
1:00 PM - 1:15 PM ET	Mimi Ho - Welcome & Introduction
1:15 PM - 5:00 PM ET	Lectures and discussions topics: <ul style="list-style-type: none"> <li>• New Developments in CryoFIB Milling</li> <li>• Tilt-Series Collection Schemes for Cellular Cryo-ET</li> <li>• The State of the Art in Tomographic Reconstruction and Subtomogram Averaging</li> <li>• Overcoming Missing-Wedge Effects and Maximizing Contrast in Cryo-ET</li> <li>• Segmentation of Cellular Tomograms</li> <li>• Emerging Technology &amp; Software</li> </ul>
Post-Workshop Time TBD	Reception at a nearby bar (on your own)  TBD location

\*Tentative and subject to change.

## Instructors

## Quick Links

- [ACA Homepage](#)
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