



2nd Workshop on Single Particle Electron Microscopy: from Theory to Practice

Dates: 27th February – 1st March 2019

Venue: Cryo-EM Lab, Dip. BioScienze, Università di Milano, Via Celoria 26.

Max participants: 8 (a few bursaries will be available)

Single-particle Electron Microscopy (SP-EM) has stepped up as the mainstream technology for studying the structure of cells, viruses and protein complexes at molecular resolution. Despite recent advances in microscope design, imaging hardware and enhanced image processing, the experiments' outcome still depends on many practical aspects of sample preparation and image acquisition.

The Workshop is particularly aimed at PhD-Students, PostDocs and Scientists in general who wish to learn single-particle EM theory and practice. The course will provide a comprehensive overview of sample preparation, image acquisition and data analysis. Tutored sessions will allow each participant to practice sample preparation through both negative staining EM and cryo-EM (sample vitrification will be practiced on a Thermo Fischer FEI Vitrobot™ Mark IV).

The course will also cover theoretical and practical aspects regarding the anatomy of a transmission electron microscope, setup of image collection, image analysis. After the workshop, attendants will be able to understand the foundations of SP-EM sample preparation, data collection and image processing. Most notably, they will be able to apply these techniques to their own research projects.

How to apply: The course is limited to 8 participants. For selection purposes applicants are required to submit a brief scientific CV and letter of motivation (max 200 words explaining why your project/research group will benefit from the workshop), **by 1st February 2018** to the following mail address: martino.bolognesi@unimi.it. Selected participants will be notified one week after the submission deadline, together with logistics and participation details.

Registration Fees: Academic Fee 350 € | Non-Academic Fee 650 €

Programme:

*** Day 1 ***

10:30 - 11:00	Welcome: participants will also introduce their lab and projects
11:00 – 11:45	[Theory] Anatomy of a transmission electron microscope
11:45 – 12:30	[Theory] Sample preparation by negative staining EM

12:30 – 14:00	Lunch break
14:00 – 15:30	[Practice] Sample preparation by negative staining EM
15:30 – 16:30	[Practice] Negative staining sample screening on TEM
16:30 – 17:30	Discussion panel: Q&A about Negative Stain EM + Projects review (discussion about potential projects, best approaches, experimental design)

*** Day 2 ***

9:00 - 9:45	[Theory] When Electron met Sample
9:30 - 10:15	[Theory] Sample preparation by vitrification: DOs and DONTs
10:15 - 10:30	Coffee Break
10:30 - 12:30	[Practice] Cryo-EM Sample Preparation using the Thermo Scientific Vitrobot Mk IV
12:30 – 14:00	Lunch break
14:00 – 16:30	[Practice] Cryo-EM Screening and setup a data collection using FEI EPU
16:30 – 17:30	Discussion panel: Q&A about Cryo-EM + Projects review (discussion about potential projects, best approaches, experimental design)

*** Day 3 ***

9:00 – 9:45	[Theory] From the image to the Figure: image processing - Part 1
9:45 – 10:30	[Theory] From the image to the Figure: image processing - Part 2
10:30 – 10:45	Coffee Break
10:45 – 12:00	[Demo] Data analysis workflow: from the raw image to a high-resolution 3-D structure

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