



3rd Single-Particle Electron Microscopy Workshop

CRYO-ELECTRON MICROSCOPY LABORATORY



UNIVERSITÀ
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Info 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.

Dates from 26th to 28th February 2020

Venue Cryo-EM Laboratory, Dipartimento di BioScienze
Via Celoria 26, MILANO - 20133

Fees Academic Fee **450,00 €**, Non-academic Fee **750,00 €**
(26th and 27th lunch breaks included, accommodation not included - Bursaries available for AIC or SIB members)

How to apply The course is limited to 8 participants. For selection purposes applicants are required to submit a brief scientific CV by 26th January 2020 to the following mail address: paolo.swuec@unimi.it. In the CV, applicants should specifically state (1) current position, (2) techniques employed in the lab, (3) active membership to Associazione Italiana di Cristallografia (AIC) or Società Italiana di Biochimica (SIB). Selected participants will be notified shortly after the submission deadline, together with logistics and participation details.

Day 1

- 10:30 - 11:00 Workshop introduction and welcoming
- 11:00 - 11:45 [Theory] The Anatomy of a transmission electron microscope
- 11:45 - 12:30 [Theory] What, how and why negative stain EM?
- 12:30 - 14:00 Lunch break
- 14:00 - 16:30 [Practice] Each applicant will perform specimen preparation and screening by negative stain EM
- 16:30 - 17:30 [Q&A] Applicants projects review (best practices and experimental design)

Day 2

- 9:30 - 10:15 [Theory] Let's get physical: the electron-matter interaction
- 10:15 - 11:00 [Theory] Cryo-EM sample preparation: DOs and DONTs of vitrification
- 11:00 - 12:30 [Practice] Cryo-EM sample vitrification on ThermoScientific Vitrobot
- 12:30 - 13:30 Lunch break
- 13:30 - 15:30 [Practice] Cryo-EM sample vitrification on ThermoScientific Vitrobot
- 15:30 - 17:30 [Demo] Cryo-EM screening, setup of data collection and "managing expectations"

Day 3

- 9:30 - 10:30 [Theory] From an Image to a Figure: data analyses (part I)
- 10:30 - 10:45 Coffee break
- 10:45 - 11:45 [Theory] From an Image to a Figure: data analyses (part II)
- 11:45 - 12:30 [Demo] Typical data analysis workflow on real life examples

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Organizing committee: Paolo Swuec, Antonio Chaves-Sanjuan, Martina Palamini, Chiara Marabelli, Martino Bolognesi.