Unravelling the Complexity of Biological Systems by Electron Microscopy

Lake Como School of Advanced Studies, 2-6 May 2022

Home

Thanks to the exceptional perspectives of Electron Microscopy an increasing number of molecular events are being positioned and understood within their detailed cellular context. Additionally, the possibility to investigate the molecular aspects of living matter at high resolution has recently come to reach thanks to Cryo-electron Microscopy.

This Advanced Course addresses early stage researchers and young scientists, exposing them the most advanced ultrastructural methods and techniques applied to the different branches of life sciences. The Course final aim is to advance the participants’ understanding on the potentials of Electron Microscopy as a new essential tool for their research.

Topics

- Unravelling the complexity of biological systems by electron microscopy
- Integrating structure and function: Correlative Microscopy in cell biology studies
- Cryo-EM and structural cell biology
- Tomography and Volume electron microscopy to explore tissue architecture
Unravelling the Complexity of Biological Systems by Electron Microscopy

Lake Como School of Advanced Studies, 2-6 May 2022

Organisers

- Elena Donetti, Maura Francolini, Nadia Santo – Università degli Studi di Milano, I
- Andrea Raimondi – Ospedale San Raffaele, I
- Paolo Ronchi – EMBL-Heidelberg, D
- Paul Verkade – University of Bristol, UK
Unravelling the Complexity of Biological Systems by Electron Microscopy

Lake Como School of Advanced Studies, 2-6 May 2022

Speakers
- Galina Beznusenko (Campus IFOM-IEO, I)
- Jemima Burden (MRC-LMCB, UK)
- Ruben Busnadiego (Georg-August Universität, D)
- Lucy Collinson (The Francis Crick Institute, UK)
- Matteo Ferroni (Università di Brescia, I)
- Christel Genoud (UNIL- Lausanne, CH)
- Helmut Gnaegi (DiATOME, CH)
- Anneke Kremer (VIB Ghent, B)
- Pedro Machado (King’s College of London, UK)
- Giulia Mizzon (University of Heidelberg, D)
- Rob Parton (University of Queensland, AU)
- Gaia Pigno (Human Technopole, I)
- Anna Sartori (Institut Pasteur – Paris, F)
- Tom Sharp (LUMC, Leiden, NL)
- Nico Sommerville (Radboudumc, NL)
- Carlo Tacchetti (Università Vita-Salute San Raffaele, I)
Programme

Click on the image to download the PDF of the programme.

Unravelling the Complexity of Biological Systems by Electron Microscopy
Lake Como School of Advanced Studies, 2-6 May 2022

Programme Details

[Programme details are not visible in the image.]
2021

About the course

Thanks to the exceptional perspectives of Electron Microscopy an increasing number of molecular events are being positioned and understood within their detailed cellular context. Additionally, the possibility to investigate the molecular aspects of living matter at high resolution has recently come into reach thanks to Cryo-electron Microscopy.

This Advanced Course addresses early stage researchers and young scientists, exposing them to the most advanced ultrastructural methods and techniques applied to the different branches of life sciences. The Course final aim is to advance the participants’ understanding on the potentials of Electron Microscopy as a new essential tool for their research.

Topics

Unravelling the complexity of biological systems by transmission electron microscopy

Integrating structure and function

Correlative Microscopy in cell biology studies

The cryo-EM resolution revolution

Tomography and Volume electron microscopy to unravel tissue architecture

Nanotechnology and other potential EM applications
Programme 2021

Programme

Day 1 (19 April 2021)

Advanced electron microscopy techniques: correlative and 3DEM (II) (14:00 – 15:45)
- Paul Verkade: An introduction to Correlative Light Electron Microscopy
- Roman Paluchuck: Use of Targeted Labelling in Pre-embedding CLEM
- Christel Genoud: The benefits and challenges offered by visualization of large volume with SEM Light Electron Microscopy

Virtual Coffee break and A virtual tour at NOLIMITS (with Prof. Alex Costa, Facility Scientific Director of NOLIMITS) and CryoEM-lab – Two of the technological platforms of Università degli Studi di Milano (15:45 – 16:15)

Advanced electron microscopy techniques: correlative and 3DEM (III) (16:15 – 18:00) (in volume with SEM
- Graham Knott: Correlating light and scanning electron microscopy to study brain connectivity
- Paolo Ronchi: Fluorescence-based 3D targeting of FIB-SEM acquisition of small volumes in large samples
- Gaia Pigno: Towards a mechanistic understanding of cellular processes by cryoEMand CLEM

Day 2 (20 April 2021)

CryoEM (14:00 – 15:45):
- Jurgen Plitzko: Behind the scenes of cryo-electron tomography or how can structural biology be carried out in situ?
- Francesca Coscia: The structure of human thyroglobulin
- Edoardo D’Imprima: Continuum resolution: from isolated protein complexes to organoids

Virtual Coffee break (DELMIC + ZEISS + FEI) (15:45 – 16:30)

Nanotechnology (16:30 – 18:00):
- Mauro Gemmi: 3D electron diffraction: the nanocrystallography revolution. Applications to pharmaceutics and macromolecules
- Roberto Marotta: The transmission electron microscope as a key tool in nanobiotechnology
Social Events

Tuesday, May 3rd

7:00 p.m. String concert