

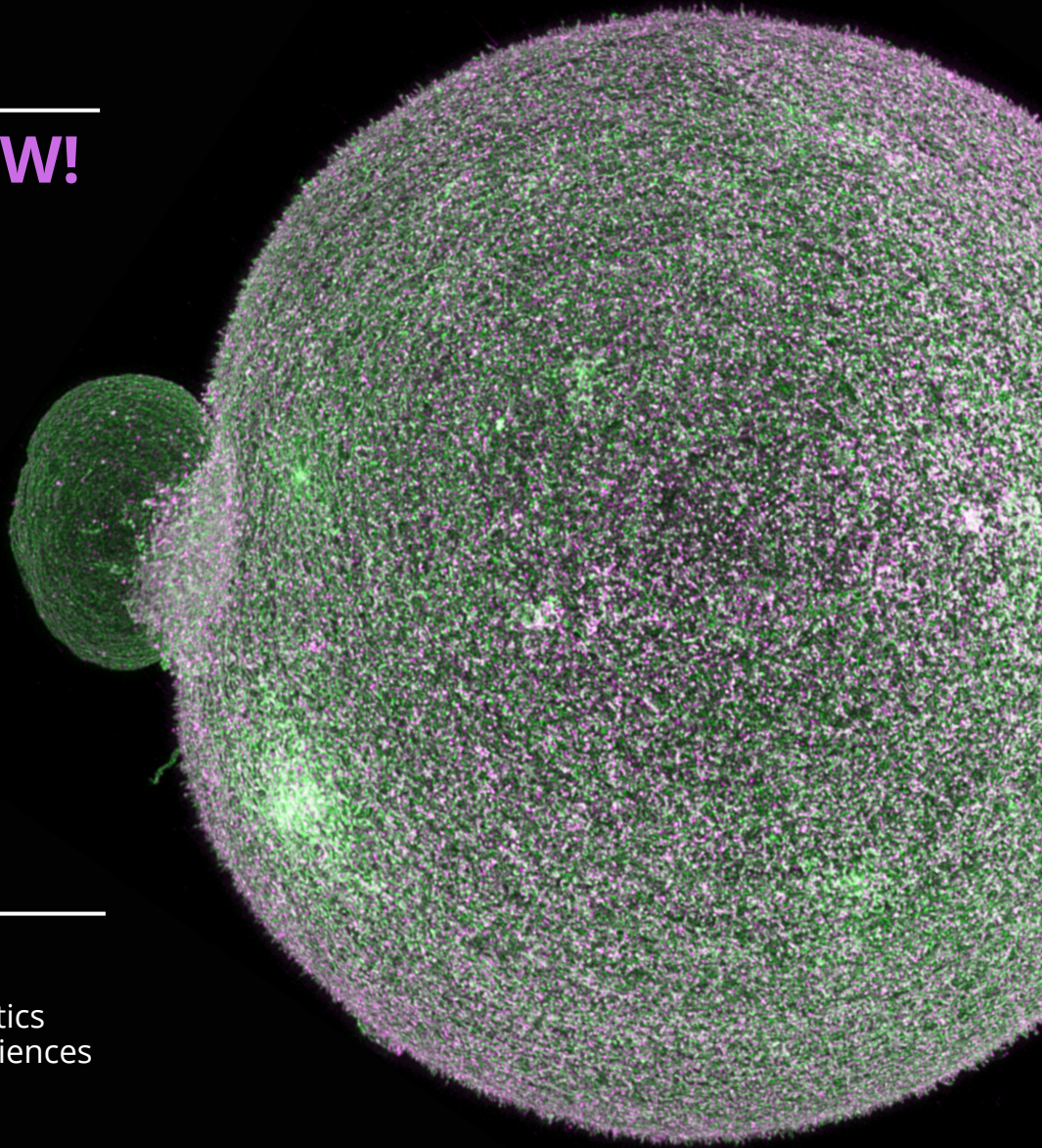
COURSE OVERVIEW

SUPER-RESOLUTION
in light microscopy

15-22 JUNE
2025

REGISTER NOW!

[https://meetings.embo.org/event/
25-superres-light-microscopy](https://meetings.embo.org/event/25-superres-light-microscopy)



VENUE

Institute of Molecular Genetics
of the Czech Academy of Sciences
Videnska 1083
CZ-142 20, Prague 4



EMBO Practical Course SRLM 2025

Super-resolution in Light Microscopy

June 15–22, 2025 | IMG Prague, Czech Republic

<https://meetings.embo.org/event/25-superres-light-microscopy>

Course Overview

This eight-day intensive practical course provides comprehensive hands-on training across the full spectrum of current high and super-resolution microscopy techniques. Structured into three focused blocks, the course combines expert lectures, practical demonstrations, interactive hands-on sessions, and networking events. A hybrid format ensures active involvement of both on-site and virtual participants.

Course Structure

Introductory Day (June 15)

The course begins with an introductory day designed to foster interaction among participants, speakers, and company representatives.

- **Participant and Company Introductions:** Brief introductions will be presented by all participants, both in-person and virtual, providing an excellent networking opportunity from the start. Company application specialists will also briefly present their teams and systems, allowing participants to become familiar with the equipment they will use throughout the course.
- **Flash Talks and Hybrid Poster Session:** Participants and companies will present concise flash talks outlining their backgrounds, research interests, or technologies they bring to the course. Following this, a hybrid poster session will take place, where scientific posters are accessible both virtually and in-person. Posters will remain accessible throughout the duration of the course to encourage continuous discussions.

Block 1: Computational and Reassignment Approaches (Days 2–3)

This block introduces participants to super-resolution confocal microscopy enhanced through computational and optical reassignment methods. Expert guidance will ensure both theoretical understanding and practical skills.

Methods Covered: Confocal microscopy enhanced with adaptive deconvolution, optical reassignment, and computational super-resolution approaches.

Demonstrated Systems:

- Leica Stellaris 8 Lightning: Adaptive deconvolution for enhanced confocal microscopy.
- Zeiss Airyscan2: Image scanning microscopy (ISM) with mathematical photon reassignment.
- Evident IXplore SpinSR: Spinning disc microscopy with optical reassignment.
- Andor Dragonfly SFFR Stream: Super Resolution Radial Fluctuations (SRRF) for rapid imaging.

Scientific Supervisor: Prof. Rainer Heintzmann (Friedrich Schiller University Jena, DE)

Block 2: Structured Illumination Microscopy – SIM (Days 4–5)

This block explores advanced Structured Illumination Microscopy (SIM) techniques designed to surpass diffraction limits and enhance spatial resolution significantly.

Methods Covered: SIM methodologies for achieving high spatial resolution through structured illumination patterns and advanced computational reconstruction.

Demonstrated Systems:

- DeltaVision OMX V4: Classical 3D-SIM implementation, providing an understanding SIM fundamentals.
- Crest Optics DeepSIM: Robust lattice SIM system optimized for imaging thicker biological samples.
- CSR Biotech MI-SIM: Flexible 2D and 3D-SIM with rapid modulation of spatial illumination patterns, facilitating high-speed imaging.
- Zeiss Elyra7 Lattice SIM 3: Advanced lattice SIM complemented by sophisticated and optimized reconstruction and deconvolution algorithms.

Scientific Supervisor: Prof. Lothar Schermelleh (University of Oxford, UK)

Block 3: Nanoscopy – STED & SMLM (Days 6–7)

Participants will gain practical skills in advanced nanoscopy methods, including Stimulated Emission Depletion (STED) microscopy and Single-Molecule Localization Microscopy (SMLM). The sessions will emphasize hands-on experience, guided by recognized experts.

Methods Covered: Advanced nanoscopy methods to achieve nanoscale imaging resolution.

Demonstrated Systems:

- Abberior STED – MATRIX detector: STED microscopy with array-based detection, significantly reducing background signals
- Leica Stellaris 8 STED Xtend: Advanced STED microscopy using fluorescence lifetime information for improved resolution
- Abbelight SAFe MN360: Advanced dual-channel 3D SMLM for precise molecular localization
- ONI Nanoimager: Compact, user-friendly system for 2D single-molecule localization microscopy

Scientific Supervisors:

Prof. Giuseppe Vicidomini (IIT Genoa, IT), expert in STED microscopy

Prof. Christian Franke (Friedrich Schiller University Jena, DE), expert in SMLM techniques

Quality Control & Post-processing (Day 8)

This final block emphasizes the importance of rigorous image quality control and responsible research conduct through practical sessions and expert-led tutorials.

Topics Covered:

- Lectures and practical sessions focused on microscopy quality control (QC)
- Demonstrations using Argolight slide patterns for microscope validation
- Software hands-on sessions using Huygens Deconvolution Software and QC Modules provided by SVI
- Dedicated discussion on FAIR (Findable, Accessible, Interoperable, Reusable) data principles and best practices

Invited Speakers (Selected):

- Paolo Bianchini (IIT, Genoa, IT)
- Michaela Blazikova (IMG CAS, Prague, CZ)
- Elisa D'Este (MPI Heidelberg, DE)
- Jana Döhner (University of Zurich, SW)
- Christian Franke (Friedrich Schiller University Jena, DE)
- Hannah Heil (Instituto Gulbenkian de Ciência, PT)
- Rainer Heintzmann (Friedrich Schiller University Jena, DE)
- Marko Lampe (DKFZ, Heidelberg, DE)
- Lothar Schermelleh (University of Oxford, UK)
- Xiaoyu Shi (University of California, Irvine, US)
- Ilaria Testa (KTH, SciLifeLab, Stockholm, SE)
- Giuseppe Vicidomini (IIT, Genoa, IT)

Organizers:

- Ivan Novotny (IMG CAS, Prague, CZ)
- Michaela Blazikova (IMG CAS, Prague, CZ)
- Jan Peychl (MPI-CBG, Dresden, DE)
- Marko Lampe (DKFZ, Heidelberg, DE)
- Ilaria Testa (KTH, SciLifeLab, Stockholm, SE)

Key Features

- **Hands-on Training:** 38 hours total practical work, including dedicated sessions for participants' samples.
- **Virtual Participation:** Comprehensive hybrid format with professional streaming and interactive virtual sessions.
- **Networking Opportunities:**
 - Flash talks, Poster session
 - Discussion forums on specialized topics (Expansion microscopy, SIM, Nanoscopy, FAIR Data)
 - Social events including dinners, BBQ, and a boat trip through historical Prague

Venue

- **Institute of Molecular Genetics (IMG), Czech Academy of Sciences, Prague**
- Modern microscopy core facility with state-of-the-art equipment
- Accommodation at Hotel ILF, facilitating networking among participants and speakers

Sustainability

- Hybrid course format to reduce travel emissions
- Commitment to sustainable practices (plastic-free materials, digital-only advertising, accessible locations)
- Financial incentives for eco-friendly participant travel, in collaboration with CAPP

Registration & Participation

- **In-person participants:** 20
- **Virtual participants:** 25
- Selection based on motivation, scientific projects, and microscopy experience
- Opportunities for participants to test own samples

Contacts and More Information

For any questions or further details, please contact the course organizers:

- Ivan Novotny
Email: ivan.novotny@img.cas.cz
- Michaela Blazikova
Email: michaela.blazikova@img.cas.cz

Course connection:



<https://meetings.embo.org/event/25-superres-light-microscopy>



https://www.instagram.com/embo_pc_srlm/



<https://www.facebook.com/embopcsrlm/>

COURSE PARTNERS

EVIDENT™

