

VIRTUAL

COURSE OVERVIEW

SUPER-RESOLUTION
in light microscopy

**15-22 JUNE
2025**

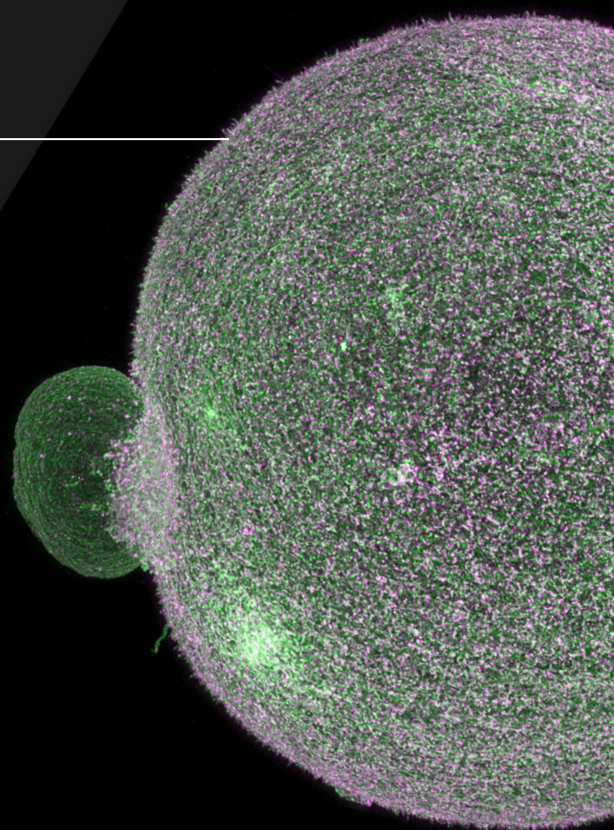
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25-superres-light-microscopy](https://meetings.embo.org/event/25-superres-light-microscopy)



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>

VIRTUAL PARTICIPATION

Course Overview

This eight-day course provides **virtual attendees** with a comprehensive and immersive learning experience in the field of super-resolution light microscopy. Through a carefully designed hybrid format, **virtual participants will access live-streamed expert lectures, system demonstrations, discussion forums, and interactive sessions, while also benefiting from extended on-demand access to recordings.**

Course Structure

Introductory Day (June 15)

The course kicks off with interactive sessions designed to connect both in-person and virtual participants:

- Participant and Company Introductions: All participants will introduce their research interests in short live presentations. Company representatives will showcase the systems available during the course.
- Flash Talks and Poster Session: Both participants and company experts will deliver flash talks. A hybrid poster session follows, with posters accessible online and discussed via virtual breakout rooms throughout the course.

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.

Virtually 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.

Virtually 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.

Virtually 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
- Bruker Vutara VXL: 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 for Virtual Participants

- All sessions live-streamed in picture-in-picture format
- Recorded access to all lectures and keynotes for 2 months post-course
- Live Q&A, moderated chat, and meet-the-speaker Zoom sessions
- Dedicated breakout rooms for poster sessions and small-group discussions
- Participation in streamed social events, including the hybrid welcome and farewell evenings

Sustainability

- Environmentally responsible virtual access
- Reduced travel footprint
- Fully inclusive hybrid structure supporting global participation

Registration & Participation

- **Virtual participants:** 25
 - Selection based on motivation, scientific projects, and microscopy experience
 - Opportunities for participants to test own samples
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Contacts and More Information

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

- Ivan Novotny
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- Michaela Blazikova
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Course connection:



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



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



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

DATE	SESSION	chairperson	TIME	ACTIVITY	NAME	
JUNE 15, 2025						
			09:00-09:45	REGISTRATION		
			9:45-10:00	OPENING	Ivan Novotny	TBA
			10:00-10:45	Resolution in light microscopy	Jan Peychl	
			10:45-11:00			Coffee break - still online
	Session 1: Introduction	Jan Peychl				TBA
			11:00-13:30	Participants flash talks, virtual/in-person		
			13:30-14:30			pause
			14:30-15:30	Companies flash talks		TBA
			15:30-16:00	Czech and Euro Biolmaging infrastructure for microscopy	Johanna Bischof / Ondrej Horvath	
			16:00-16:30			Coffee break - still online
			16:30-17:10	Sample preparation for SR microscopy	Jana Döhner	
			17:10-18:00	Super-resolution microscopy, principles and trends	Marko Lampe	Keynote lecture
			18:00-18:15			Pause
	Session 2: Hybrid poster session					
			18:15-20:45	Poster session + Virtual poster session and Banquet Dinner Among Posters		Start online poster platform, 3 independent rooms in Zoom TBA

	20:45-21:00	Poster session and Virtual poster session winner announcement	Organizers	TBA
	21:00			Evening sign-off
JUNE 16, 2025				
Session 3a: Soft SR methods	Jan Peychl			
	09:00-09:40	Computational approaches in SR microscopy	Michaela Blazikova	TBA
	09:40-10:30	Optical and mathematical reassignment	Rainer Heintzmann	Keynote lecture
	10:30-10:50			Coffee break
	10:50-11:20	Airyscan 2 - IMS implementation	Zeiss, Pavel Krist	
	11:20-11:50	IXplore SpinSR SORA implementation	Evident, Tomas Pop	
	11:50-12:50			pause
Session 3b: Soft SR methods	Michaela Blazikova			
	12:50-13:30	SRRF super-resolution solution	Hannah Heil	TBA
	13:30-14:00	Practical usage of deconvolution in confocal	Ivan Novotny	
	14:00-14:30	Lightning adaptive deconvolution	Leica, Ulf Schwarz	
	14:30-15:00	SRRF Stream	Andor, Aishwarya Sivakumar	
	15:00-15:15	Organizing note about practical sessions	Michaela Blazikova	
Session 4: Practical blocks 1, 2 and 3				

		15:15-17:00	Practical session Leica Lightning	Online stream	TBA
		17:00-17:15		Pause	
		17:15-19:00	Practical session Evident Ixpire SpinSR	Online stream	TBA
		19:00-20:00	Meet-the-Speakers Dinner	Online stream	TBA
		20:00-20:30	Online tour among microscopes, voluntary session	Online stream	TBA
		21:00		Evening sign-off	
JUNE 17, 2025					
Session 5	Ilaria Testa				
		09:00-09:30	Deconvolution strategies for super-resolution	SVI, Wouter van Beerendonk	TBA
		09:30-10:00	Lennartz: Practical aspects of SORA usage	Mathilda Hjoerdis Lennartz	
		10:00-10:20		Coffee break - still online	
		10:20-10:50	Expansion microscopy of protists	Marie Zelena	
		10:50-11:40	Revealing the cell's architecture using Ultrastructure Expansion Microscopy methods	Virginie Hamel	Keynote lecture
		11:40-12:45	Lunch and Discussion Forum 01: Expansion microscopy	Lunch and networking - Online stream	
Session 6: Practical blocks 4, 5 and 6					
		12:45-14:30	Practical session: Andor Dragonfly SRRF Stream	Online stream	TBA
		14:30-14:45		Pause	

	14:45-16:30	Practical session: Zeiss Airyscan 2		Online stream	TBA
	16:30-16:45			Pause	
	16:45-17:45	Online stream for volunteers: PARTICIPANTS SAMPLES preview		Online stream	TBA
	17:45-20:15			Pause	
	20:15-21:00	After Block #1: Grill garden dinner at a nearby location		Online stream (depends on sig	TBA
	21:00			Evening sign-off	
JUNE 18, 2025					
Session 7: Structured		Ivan Novotny			
	09:00-09:30	Structured illumination in practical usage	George Lister		TBA
	09:30-10:20	New imaging avenues to interrogate chromatin structure and function down to the molecular scale	Lothar Schermelleh	Keynote lecture	
	10:20-10:40			Coffee break - still online	
	10:40-11:10	DeltaVision OMX – standards for 3D SIM	TBA		
	11:10-11:40	MI-SIM	CSR Biotech, Christiaan Stuut		
	11:40-12:10	The Lattice SIM family: Approaches to improve temporal and spatial resolution in Structured Illumination Microscopy	Zeiss, Klaus Weisshart		
	12:10-13:10			Pause	
	13:10-13:40	DeepSIM	Crest Optics, TBA		TBA
	13:40-14:10	Bordetella in super-resolution	Ivana Malcova		

Session 8: Practical blocks 7, 8 and 9				
	14:15-16:00	Practical session: Zeiss Lattice SIM	Online stream	TBA
	16:00-16:15		Pause	
	16:15-18:00	Practical session: Crest Deep SIM	Online stream	TBA
	18:00-19:00	Meet-the-Speakers Dinner	Online stream	TBA
	19:00-20:00	Online stream for volunteers: PARTICIPANT SAMPLES on microscopes - preview	Online stream	TBA
	20:00		Evening sign-off	
JUNE 19, 2025				
Session 9: Practical blocks 10, 11 and 12				
	09:00-10:45	Practical session: CSR Biotech MI-SIM	Online stream	TBA
	10:45-11:00		Pause	
	11:00-12:45	Practical session:: DV OMX V4	Online stream	TBA
	12:45-13:30	Lunch and Discussion Forum 02: SIM's not dead	Networking, Online stream	TBA
			Mid-Course Intermission	

JUNE 20, 2025					
Session 10: Nanoscopy	Marko Lampe				
	09:00-09:40	STED Principles and trends	Elisa D'Este		TBA
	09:40-10:30	STED development and image scanning microscopy	Giuseppe Vicidomini	Keynote lecture	
	10:30-10:50			Coffee break - still online	
	10:50-11:20	STED MATRIX detector	Abberior, Dennis Uhlenkamp		
	11:20-11:50	STED Xtend	Leica, Ulf Schwarz		
	11:50-12:50				pause
	12:50-13:40	SMLM Principles and perspectives	Christian Franke	Keynote lecture	TBA
	13:40-14:10	Volumetric 3D SMLM with the Bruker Vutara VXL	Bruker, Corentin Rousset		
	14:10-14:40	The Nanoscopy Revolution: Unlocking Spatial Proteomics at unprecedented resolution	Abbelight, TBA		
Session 11: Practical blocks 13, 14 and 15					pause
	14:45-16:30	Practical Practical session: Bruker Vutara VXL		Online stream	TBA
	16:30-16:45			Pause	TBA
	16:45-18:30	Practical session: Abbelight SMLM		Online stream	TBA
	18:30-18:45	Starlab: Sustainability measures in lab consumables production	Starlab, TBA		TBA

		18:45-19:45	Meet-the-Speakers Dinner		Online stream	TBA
		20:00			Evening sign-off	
JUNE 21, 2025						
Session 12	Christian Franke					
		09:00-09:30	STED visualization of actin filaments in mouse MI oocyte spindle	Michaela Frolikova		TBA
		09:30-10:20	Multiphoton microscopy and nanoscopy	Paolo Bianchini	Keynote lecture	
		10:20-10:40			Coffee break - still online	
		10:40-11:20	Caught in a moment: monitoring proteins dynamics at the nanoscale with light patterning and photoswitching	Francesca Pennacchietti		
		11:20-12:10	Lunch and Discussion Forum 03: Parallelization options in SR	Networking	Online stream	TBA
Session 13: Practical blocks 16, 17 and 18						TBA
		12:30-14:15	Practical session: Leica STED Xtend		Online stream	TBA
		14:15-14:30			Pause	
		14:30-16:15	Practical session: Abberior STED - MATRIX		Online stream	TBA
		16:15-16:30			Pause	
		16:30-17:30	Practical block 18 - PARTICIPANT SAMPLES preview		Online stream	TBA
		19:30-20:20	SMLM and ExM – limits and combinations (online)	Xiaoyu Shi	Online stream	TBA
		20:00-22:30	After Block #3: Farewell BBQ		Online stream (depends on sig	TBA

	21:00		Evening sign-off	
JUNE 22, 2025				
Session 14: Quality cc		Michaela Blazikova		
	09:00-09:30	LiveCODIM	Telight, Matyas Krijt	TBA
	09:30-10:10	What Makes a Good Microscopy Image? A Quantitative Perspective	Bruno M. Saraiva	
	10:10-10:30	Argolight slide - Standard for system QC	SVEN BIOLABS, Ondrej Hovorka	
	10:30-10:50	Bioconjugation Strategies for Dye Labeling	DIANA, Jiří Schimer	
	10:50-11:10		Coffee break - still online	
	11:10-11:40	Huygens module for image quality control	SVI, Wouter van Beerendonk	Online stream TBA
Session 15: Practical block 19				
	11:40-13:30	Huygens Image Deconvolution and QC Module	SVI, Wouter van Beerendonk	Practical session - online TBA
	13:30-14:30	Lunch and Discussion Forum 04: FAIR data by EuBI		Networking - Online stream TBA
	14:30-15:00	Course evaluation and closing remarks	Ivan Novotny	
	15:00		Final sign-off	

COURSE PARTNERS

main partners



local partners

