

Thematic school on Super-Resolution Imaging techniques

October 14 - 16, 2026 - Bordeaux, France

Program:

Day 1 - Wednesday 14th of Oct.	Day 2 - Thursday 15th of Oct.	Day 3 - Friday 16th of Oct.
	Probes and and labeling strategies for SR Z Chen (PKU, China)	SMLM data reconstruction 1: Principle and conventional approaches JB Sibarita (IINS, France)
Welcome words & Introduction		SMLM data reconstruction 2: PSF retrieval and Deep-learning based localization F Xu (BIT, China)
Tutorial from widefield microscopy to super resolution M. Mondin & C. Pujol (BIC, France)	Introduction to single-molecule localization microscopy (SMLM) M Mondin (BIC, France)	Coffee Break
Introduction to SR technique M. Mondin (BIC, France)	Coffee Break	Structured Illumination Microscopy X Huang (PKU, China)
Coffee Break	Multiplexing in SMLM EM Schentarra (Max-Planck Institute, Gemany)	
STED Microscopy C. Pujol (BIC, France)	Volumetric SMLM in depth: R Galland (IINS, France)	Expansion Microscopy M Fernandez-Monreal (BIC, France)
Lunch Break	Lunch Break	Lunch Break
Workshops	Workshops	Workshops
Workshops	Workshops	Workshops
Coffee Break	Coffee Break	Coffee Break
STED application seminar M Grison (LBM, France)	SMLM application seminar F Domart (IINS, France)	SIM application seminar L. Chen (PKU, China)

Workshops:

Possibility to attend to 6 workshops amongst the following proposals:

- **Basics of SMLM : 2 color STORM 2D on cell culture**

Short description: Principle of 2 color STORM imaging from sample preparation, acquisition workflow, up to basic consideration and available software for image reconstruction.

System: GSDIM microscope (Nikon)

Trainers: Magalin Mondin (BIC, France) / Théo Dudon (IINS, France)

- **3D and Multiplexing in SMLM:**

Short description: Principle of astigmatism-based 3D SMLM acquisition and DNA-PAINT multiplexing using Exchange-PAINT protocol will be demonstrated. Special consideration regarding sample preparation and calibration will be discussed. A 2 to 3 plex acquisition workflow will be demonstrated

System: Home-made Nikon 3D SMLM microscope

Trainer: Eva Maria Schentarra (Max Planck Institute, Germany)

- **High- to Super-resolution Lattice-Light Sheet imaging on brain slices:**

Short Description: Principle of Lattice Light Sheet Microscope (LLSM) will be presented and demonstrated imaging brain slices. Combination of LLSM with Adaptive Optics will be discussed to allow 3D SMLM imaging in depth within brain slices.

System: Home-made LLSM from Janelia Farm microscope layout

Trainers: Mathieu Ducros (BIC, France) / Thibault Brugière (IINS, France)

- **SMLM in depth using the soSMART imaging platform (AO & soSPIM):**

Short Description: Principle and challenges of performing SMLM in depth within complex 3D samples will be discussed. The soSMART imaging platform which combines Adaptive Optics and soSPIM imaging will be presented and demonstrated by performing SMLM imaging in depth within spheroids.

System: Home-made APO-soSPIM imaging system

Trainer: Rémi Galland (IINS, France)

- **STED 1:**

Short description: STED imaging will be presented and the various calibration steps and acquisition parameters will be discussed. STED imaging on brain slices will be demonstrated.

System: STED microscop from LEICA

Trainer: Christel Poujol (BIC, France)

- **STED 2:**

Short description: STED imaging will be presented and the various calibration steps and acquisition parameters will be discussed. STED imaging on brain slices will be demonstrated.

System: STED microscop from ABBEOR

Trainer: Magali Mondin (BIC, France)

- **SIM 1 :**

Short description: SIM imaging principles will be discussed and demonstrated on 2D cell cultures.

System: Hessian SIM on CSR biotech system

Trainer: Xianxin Ye (PKU, China)

- **SIM 2 :**

Short description: SIM imaging principles will be discussed and demonstrated on 2D cell cultures.

System: Lattice SIM on ZEISS system

Trainer: TBD

- **Expansion microscopy :**

Short description: Expansion microscopy principle will be presented. Different sample preparation steps will be demonstrated and discussed according to the final expansion factor targeted. Expanded samples will be imaged to discuss resolution gain and labelling parameters.

System: Confocal microscope (BIC)

Trainers: Mónica Fernández Monreal (BIC, France) / Juliette Vours (BIC, France)

- **SMLM reconstruction 1: conventional localization methods**

Short description: Principles and pitfalls of SMLM reconstruction will be discussed and new NAPARI plugin (PALMTracer) for SMLM reconstruction will be presented and demonstrated.

System: PALMTracer

Trainers: Jean-Baptiste Sibarita (IINS, France)

- **SMLM reconstruction 1: Advanced deep-learning based reconstruction**

Short description: INSPR PSF retrieval algorithm will be presented and demonstrated. Implementation of an advanced deep-learning based localization model (SRST) enabling high-density 3D localization of single molecule will be demonstrated.

System: INSPR, SRST

Trainers: Fan Xu (BIT, China)

- **SMLM visualization :**

Short description: A Virtual Reality solution for SMLM data sets representation and navigation will be presented and demonstrated.

System:

Trainers: Thomas Blanc (Curie Institute, France)

- **SIM reconstruction and analysis**

Short description: Principles and pitfalls of SIM image reconstruction will be discussed and demonstrated.

System:

Trainers: Xianxin Ye (PKU, China)

- **SMLM clustering analysis**

Short description: The PoCa software will be presented and demonstrated. It allows the segmentation of clusters and co-localization analysis of 3D multi-color SMLM data-sets.

System: PoCA

Trainers: Florian Levet (IINS, France)