



# Fundamentals of Widefield and Confocal Microscopy and Imaging

EMBL COURSE



**We have moved our website to [embl.org/events](https://embl.org/events). The content below is no longer being updated.**

## **EMBL Courses and Conferences during the Coronavirus pandemic**

With the onsite programme paused, many of our events are now being offered in virtual formats.

Registration is open as usual for many events, with back-up plans in place to move further courses and conferences online as necessary. Registration fees for any events affected by the COVID-19 disruption are fully refundable.

More information for participants of events at EMBL Heidelberg can be found [here](#).

## Programme

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### Day 1 - Monday 13 May 2019

Time

Location

08:40 - 09:00

**Arrival & Welcome**

Courtyard A+B

Time		Location
	<b>Basics of optics and microscopy</b> <ul style="list-style-type: none"> <li>• <i>Theoretical basics of light and optics</i></li> <li>• <i>Types of microscope frames – and types of optics</i></li> <li>• <i>Set up bright field microscopes and the appropriate optics for different needs</i></li> <li>• <i>Cleaning, centering adjusting and operating a microscope</i></li> <li>• <i>Basic set up and use of imaging devices</i></li> </ul> <b>Hands on session 1</b>	
09:00 - 13:00		Courtyard A+B
13:00 - 14:00	Lunch	EMBL canteen
	<b>Contrast methods</b> <ul style="list-style-type: none"> <li>• <i>Introduction into contrast methods (phase contrast and differential interference contrast/DIC)</i></li> </ul>	
14:00 - 15:00		Courtyard A+B
	<b>Contrast methods - set up and alignment</b> <ul style="list-style-type: none"> <li>• <i>Set up and use of contrast methods: phase contrast and differential interference contrast/DIC</i></li> </ul> <b>Hands on session 2</b>	
15:00 - 17:30		Courtyard A+B
17:30 - 18:00	Discussing open questions	Courtyard A+B
18:00 - 19:00	Dinner	EMBL cafeteria
19:00	EMBL Bus to ISG Hotel	ATC main entrance

## Day 2 - Tuesday 14 May 2019

Time		Location
	<b>Basics of digital imaging</b> <ul style="list-style-type: none"> <li>• <i>Adaptation of digital cameras and their alignment</i></li> <li>• <i>Interpretation of image content, histogram and digital filter functions</i></li> <li>• <i>Improving digital image contrast</i></li> </ul>	
09:00 - 12:30		Courtyard A+B
12:30 - 13:30	Lunch	EMBL canteen

Time		Location
	<b>Fluorescence microscopy I</b> <ul style="list-style-type: none"> <li>• <i>Introduction to fluorescence microscopy</i></li> <li>• <i>Setting up of microscopes and cameras for fluorescence observation</i></li> <li>• <i>The different types of illumination sources (e.g. mercury, xenon, metal halide or LED)</i></li> <li>• <i>Cubes, filters and objectives</i></li> <li>• <i>Find the appropriate filter combination for a given fluorochrome and application</i></li> </ul> <b>Hands on session 3</b>	
13:30 - 16:00		Courtyard A+B
16:00 - 17:30	Discussing open questions	Courtyard A+B
17:30 - 18:40	Dinner	EMBL canteen
18:40	EMBL Bus to ISG Hotel	ATC main entrance

## Day 3 - Wednesday 15 May 2019

Time		Location
	<b>Fluorescence microscopy II</b> <ul style="list-style-type: none"> <li>• <i>Auto-fluorescence – a source for noise</i></li> <li>• <i>Digital imaging for fluorescence microscopy</i></li> <li>• <i>Specific needs of digital cameras</i></li> <li>• <i>Digital multicolor handling</i></li> <li>• <i>Acquisition of multidimensional images (3D, time)</i></li> </ul> <b>Hands on session 3 (continued)</b>	
09:00 - 11:30		Courtyard A+B
11:30 - 11:35	Group picture	
11:35 - 12:30	Guided tour at the EMBL Advanced light microscopy facility (ALMF)	ALMF
12:30 - 13:30	Lunch	EMBL canteen
13:30 - 15:00	Introduction to the confocal microscope (Talk)	Courtyard A

Time		Location
	<p><b>Hands on session (Group work)</b>  <i>Different applications will be covered in small groups.</i>  <i>Module 1: Multicolor imaging</i>  <i>Module 2: Photomanipulation techniques – FRAP, FLIP and Photoconversion</i>  <i>Module 3: 3D image collection and enhancement – zooming, resolution, SNR, z-stacks, IMARIS basic</i>  <i>Module 4: Time-lapse imaging, bleaching and viability; Multi-Area Time-Lapses and Stitching</i></p>	Microscopy rooms
15:00 - 18:00		
18:00	EMBL Bus via ISG Hotel to Restaurant Goldener Falke (Hauptstraße 204)	ATC main entrance
19:00	Dinner in downtown Heidelberg	

## Day 4 - Thursday 16 May 2019

Time		Location
09:00 - 10:00	FRAP and Photoconversion (Talk)	Courtyard A
10:00 - 13:00	<p><b>Hands on session (Group work)</b>  <i>Work in Modules</i></p>	Microscopy rooms
13:00 - 14:00	Lunch	EMBL Canteen
14:00 - 17:00	<p><b>Hands on session (Group work)</b>  <i>Work in Modules</i></p>	Microscopy rooms
17:00 - 18:00	Comparative time-lapse overnight experiment on three different setups	Microscopy rooms
18:00 - 19:10	Dinner	EMBL Canteen
19:10	EMBL Bus to ISG Hotel	ATC main entrance

## Day 5 - Friday 17 May 2019

Time		Location
09:00 - 09:30	Evaluation and summary of overnight timelapse acquisition	Courtyard A
09:30 - 12:30	<p><b>Hands on session (Group work)</b>  <i>Work in modules</i></p>	Microscopy rooms

Time		Location
12:30 - 13:00	Tips and tricks for data presentation	Courtyard A
13:00 - 13:05	Closing remarks	Courtyard A
13:05 - 13:15	Packed lunch	Foyer Courtyard
13:15	EMBL Bus via ISG Hotel to main train station	ATC main entrance