

Scientific and technical environment of the training course



Institut de la vision
<http://www.institut-vision.org/fr>

COURSE DIRECTORS

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LOCATION

PARIS (75)

ORGANISATION

5 days
 From 09:00 am to 06:00 pm
 Training course in english
 From 7 to 20 attendees

TRAINING FEES

2500 Euros

AT THE END OF THE TRAINING COURSE

Satisfaction survey from trainees
 A certificate of training is delivered.

COURSE DATE

Ref. 19 146 : from Monday 07/10/19 to Friday 11/10/19

January	February	March	April
May	June	July	August
Sept.	Oct. 19 146	Nov.	Dec.

Optical control of brain functioning with optogenetics and wave front shaping

OBJECTIVES

- Be able to choose the most suitable combination of actuator, illumination methods and targeting strategy for each specific application
- Acquire the skills and technologies required to design and build up an optical system for optical control of neuronal circuits

AUDIENCE

Neurophysiologists, physicists (researchers, PhD students or engineers)

PRE-REQUIREMENT

Attendees should have a strong background in neurosciences, in cell biology or in optical microscopy. To adapt the programme to trainees' expectations, we invite the attendees to download and fill out the survey from our web site.

TRAINING PROGRAMME

Lectures

- Introduction to optogenetics
- Opsin photo-cycle modeling
- Wave front shaping and liquid crystal matrix
- Computer generated holography
- Generalized phase contrast
- Temporal focusing
- Three dimensional light patterning and temporal focusing
- Two-photon optogenetics: scanning, spiral scanning, parallel illumination: examples and comparison among the different approaches
- How to build up an holographic optical set-up
- All-optical interrogation of brain circuits
- Patterned voltage and calcium imaging
- Viral vector design
- In depth patterned optogenetics

Practical courses (in small rotating groups of 7 participants max with 2 trainers by group)

- How to build up an holographic optical set up (optical design and software)
- In vitro and in vivo all-optical manipulation of neuronal circuits
- Projects from applicants (practical): proposition of projects by the participants and discussion on their feasibility

Lectures (14h), workshops (14h) and presentations of projects (8h)

Detailed programme available from our web site

SPEAKERS

V. Emiliani, E. Papagiakoumou, N. Accanto, E. Ronzitti, D. Dalkara, D. Tanese (researchers, IDV, Paris), C. Wyart (researcher, ICM, Paris), D. Oron, O. Yizhar (researchers, Weizmann Institute) and P. Hagemman (PR, Institut for experimental biophysics, Berlin)