# HANDS-ON COURSE on MINDLAB: Manipulating and Investigating Neural Dynamics for Learning and Ageing in the Brain

November 04, 2025 to November 07, 2025
ICFO Auditorium

****In collaboration with Lasers4EU and 360 CARLA projects****

The core faculty of the ICFO-MINDLAB, a think tank working jointly towards a transdisciplinary understanding of the brain, offers a school to introduce cutting edge technologies to study neuroscience at the molecular, cellular and systems level to students in a combination of lectures and hands-on experience leading to group projects.

**What is MINDLAB?**

**MINDLAB** stands for i¿½**Manipulating and Investigating Neural Dynamics for Learning and Ageing in the Brain**i¿½ and is an interdisciplinary creative playground rooted squarely in academic rigor, comprising of research groups from ICFO and beyond. We focus on advancing fundamental knowledge on how the mind emerges from the behavior of individual molecules, neurons and brain networks but also creating and commercializing transformational future technologies with outstanding potential to impact our society for good.

Hence,?**this course will expose participants to the state-of-the-art of photonics-based technologies tailored to monitor a hierarchy of scales in the study of the brain**: i.e. from single molecules up to the whole organism.

The?**MINDLAB faculty**?includes world leading experts in their fields. The expertise of the core faculty is complemented by a diverse set of affiliated adjunct faculty from various research centres in Barcelona but also through clinical and corporate partners.

This year's school will open with the Annual Meeting of the **Barcelona Medical Photonics Network (BMPN)**. BMPN is a platform to promote the research and development activities in photonics being carried out in the Barcelona region through long-standing collaborations

between ICFO and its biomedical and clinical partners. Always centered around a targeted clinical area, this forth edition of the BMPN annual meeting is perfectly aligned with the scope of MINDLAB. By addressing real-world healthcare challenges, BMPN will set the stage for the training program, providing essential context and inspiration for participants. The speakers and audience will include clinicians as well as technology developers and innovation managers, from the Network but also professionals and collaborators from outside the region.

**Lecturers:**

Laura Pedraza (University of Pisa)
Ilias Tachtsidis (University College London)
Katrin Willing (University of Augsburg)
Joy A. Franco (Harvard Medical School)
Jordi Soriano Fradera (University of Barcelona)
Maria Garcia-Parajo (ICFO)
Michael Krieg (ICFO)
Nicoletta Liguori (ICFO)
Pablo Loza-Alvarez (ICFO)
Pau Gorostiza (Institute for Bioengineering of Catalonia)
Turgut Durduran (ICFO)

**Hands-on sessions:**

Participants will engage in lab sessions focused on the latest photonics technologies. Each lab session will provide participants with an opportunity to work directly with advanced equipment and gain valuable practical skills.

The sessions will take place in the following labs:

Super resolution Light microscopy and Nanoscopy
Neurophotonics and Mechanical Systems Biology
Medical Optics
Photon Harvesting in Plants and Biomolecules
Single Molecules Biophotonics

**Eligibility:**

We welcome applications from motivated students and early-stage researchers across a range of disciplines: physics, optics, engineering, electronics, mathematics, chemistry, biology, and related fields.

Priority will be given to master's-level and advanced undergraduate students, though PhD candidates and young postgraduates are also encouraged to apply. ??

**How To Apply:**

There is **NO fee** for students to attend the school.

Applicants must submit:

A Curriculum Vitae, including contact details.
A statement of purpose outlining their motivation for attending the school.

Applications must be submitted online, and all required application material must be complete in order to be considered.

The **deadline** for applications is **September 30, 2025**. Successful applicants will be notified during the week of October 13, 2025.

For any questions, please contact us at frontiers@icfo.eu

**Venue:**

**ICFO** is a young research institution that aims to advance the very limits of the science and technology of light, tackling important challenges faced by society at large in all areas of life, including health, energy, information, safety, security and caring for the environment. ICFO is a member of BIST, the Barcelona Institute of Science and Technology, and is situated in Castelldefels, a small town located by the sea just outside of Barcelona, Spain.

More information about how to get to ICFO can be found HERE.

**About:**

MINDLAB course is part of the Frontiers Research Schools series. The series aims at giving

talented young researchers and students worldwide a first introduction to a thematic research area and a taste of an international research environment. These schools incorporate a dynamic and social learning environment beyond participating in lectures, including group discussions, direct interactions with the lecturers, student talks and poster presentations.

ICFO does not tolerate any type of conduct or behavior considered harassment or bullying and has clearly defined policies against harassment.

**Organizing Committee:** Prof. Dr. Pablo Loza-Alvarez, Prof. Dr. Turgut Durduran, Prof. Dr. Michael Krieg, Dr. Lorenzo Cortese, Prof. Dr. Nicoletta Liguori, Prof. Dr. Niek van-Hulst, Prof. Dr. Maria Garcia-Parajo, Dr. Ariadna Martinez Marrades, Miss Judith Salvador Herena, Dr. Giovanna Petrillo, Dr. Miguel Angel Moreno.

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