

2026 ICFO Summer Fellows: from zebrafish brains to quantum algorithms

This summer, undergraduate and master's students from Spain, the United States, Ecuador and China joined ICFO's research groups as 2026 Summer Fellows.
During the summer, they built instruments, wrote software and tackled open questions in quantum physics and biophotonics, to name a few.

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Every summer, ICFO opens its doors to a group of undergraduate and master's students from around the world who spend a few months at the institute learning about the research that is taking place. These students join research groups across ICFO, working side by side with scientists on real projects in photonics, quantum technologies and related fields, among others. Beyond hands-on lab and theory work, the program offers lectures by group leaders and visits to ICFO's facilities, giving fellows a broad view of cutting-edge research in

light-based science. For many, it is a first taste of life, a first glimpse as a researcher and an opportunity to explore whether a scientific career is the right path for them.

This year, the summer fellows that joined ICFO came from universities including the University of Rochester, the University of Texas at San Antonio, Florida Polytechnic University, UPC, UAB, Escuela Politecnica Nacional in Ecuador (Ecuador), and Wuhan University of Technology (China). Each was hosted by an ICFO research group and worked on a project of their own, with stays running from May to the end of September.

The program, organized by the Education and Scientific Training team led by Prof. Veronica Ahufinger, started on July 2nd with a welcome meeting and ice-breaker session led by Sarah Blanchette, coordinator of the program.

Among the projects assigned to the students, a compact, automated optical coherence tomography system with Python software was built, capable of 1D to 3D scans at about 10-micrometre resolution and suited for teaching. A software pipeline that turns huge zebrafish brain recordings into neuron connectivity maps was also created, identifying around 20,000 neurons in nine functional communities in one fish, and recorded about thirty datasets himself. Or even the STED microscopy and image analysis was used in another project to develop two pipelines for detecting protein nanoclusters involved in how cells sense their surroundings' stiffness, including in tumours.

From July to September, student coffees connected the fellows with ICFO's wider student community, while internal social events helped them bond as a group.

As a final main assignment of the program, each fellow was instructed to give a seven-minute talk on the project they had chosen to do, the objectives that they wanted to fulfill and the outcomes that they attained. Then, all these presentations were gathered into a final report that is shared and used as an engaging tool and basis for future students that wish to apply to the program in the years to come.

Summer internships give students something the classroom rarely can, that is, the chance to do real research alongside working scientists. By joining a lab, they learn how projects are conducted in reality, from writing proposals, to designing experiments and writing code to troubleshooting when things don't go as planned but also learning how to network and initiate collaborations. This hands-on experience builds practical skills and, most importantly, an honest look at whether a life in research is the right fit.