New ICFO Group Leader

ICFO welcomes Prof. Maria Garcia-Parajo as the leader of the Single Molecule Biophotonics group.

June 10, 2011

On June 9, ICREA Prof. Maria Garcia-Parajo joined ICFO as the leader of the Single Molecule Biophotonics group.

Dr. Maria Garcia-Parajo obtained her PhD in Physical Electronics in 1993 at Imperial College, London (UK) with a thesis on fabrication and photoluminescence spectroscopy of quantum pillar structures. After acquiring extensive expertise in scanning probe microscopy at L2M/CNRS, Bagneux (France) and University of Barcelona (Spain), in 1996 she moved to the Applied Optics group of the University of Twente, the Netherlands. In 1998 she obtained the prestigious 5-year ¨Research Academy Fellowship¨ from the Royal Dutch Academy f Sciences. She focused on single molecule detection and spectroscopy using near- a d far-field optical techniques, with an accent on the photophysics and photodynamics

f individual emitters, excitonic interactions between coupled systems and near-field effects n single emitter emission. In 2005 she was appointed as ICREA Research Professor at t e IBEC-Institute for Bioengineering of Catalonia, leading the Single Molecule Bionanophotoni s Group. She pioneered the application of near-field optical microscopy to the study f nanoscale organization on intact cell membranes, and more recently used optic l nano-antennas to generate strong nanoscale optical fields and superfocusing on t e proximity of cell membranes.

Prof. Garcia-Parajo?s research program at ICFO focuses on the development of advanced optical techniques fully adapted to the study of biological processes at the single molecular level on living cells. These techniques combine high spatial and temporal resolution for the dual goals of probing and manipulating biological function on live cells. Quantitative nanoscale optical imaging is currently obtained using near-field approaches. Her future goal is to exploit novel approaches of photonic antennas and nano-photonics to provide simultaneous nanoimaging and nanospectroscopy on living cells, while complementing these techniques with other far-field nanoscopy methods. Fluorescence correlation spectroscopy in ultraconfined volumes, as afforded by subwavelength aperture probes or antennas, and multi-color single particle tracking will be exploited to gain access to dynamic processes down to the microsecond time resolution. In parallel, her aim is to bring biophysical inside into fundamental biological questions that have important implications for health and disease, including cell biology and immunology, in close collaboration with biologists. For this, aside from visualizing spatiotemporal events on living cells, the research program will also focus of developing tools that allow exerting mechanical stimulation (forces or geometrical constraints) at the nanoscale in conditions that emulate physiological shear-stress. Single molecule fluorescence techniques will provide read-out on the re-modeling of signaling platforms on the cell membrane as response to the applied force, having ultimate consequences on cellular function.

Welcome, Maria!