# MSCA Doctoral Network: Photosynthetic Antennas in a Computational Microscope

## ICFO doctoral candidate will study the network of proteins and interactions responsible for regulating sunlight harvesting in plants

August 14, 2023

Ten European partnering institutions and companies created a network to offer an inter-disciplinary training program focused on a combination of cutting-edge computational methods

Doctoral Candidates will conduct research in academic and non-academic environments

Research focus in line with the EU missions and partnerships on Food, Agriculture and Adaptation to Climate Change.

Ten European partnering institutions and companies participate in the EC's Horizon Europe Marie Sk?odowska-Curie Action Doctoral Network entitled **Photosynthetic Antennas in a Computational Microscope: Training a new generation of computational scientists** ( **PhotoCaM**), which has recently received the highest possible evaluation from the review committee. With a total awarded budget of about 2,6 Million Euro, this Doctoral Network aims to implement a joint doctoral program with 10 Doctoral Candidates (DCs), each in a different partner organisation from different sectors across Europe, to train highly skilled PhD students, stimulate their creativity, enhance their innovation capacities and boost their employability in the long-term. **PhotoCaM** will be coordinated by Constructor University in Bremen, Germany, with vice-coordination by the University of Patras.
**PhotoCaM** aims to train a new generation of computational scientists which can treat complex and interdisciplinary problems in light harvesting at a molecular level using theoretical and computational tools. The interdisciplinary nature of the problems requires knowledge from biology, chemistry, physics and computer science in order to combine state-of-the-art approaches like structural biology (structure predictions), molecular dynamics simulations, quantum chemistry, theoretical spectroscopy and machine learning into multi-scale schemes.
The main objectives of **PhotoCaM** will be achieved within ten related individual projects, with an equilvalent number of DCs to be hosted by the partnering institutions who represent a diverse area of expertise (classical molecular dynamics, quantum dynamics, and spectroscopic applications):

**Universities and Research Centres:**

Constructor University, Bremen, Germany
University of Patras, Greece
University of Pisa, Italy
University of Groningen, Netherlands
Vilnius University, Lithuania
ICFO, Spain
Johannes Kepler University Linz, Austria
Karlsruhe Institute of Technology, Germany

In addition to acting as a home institution for a DC, the participating organizations will host at least two foreign DCs through secondments which will provide the means to conduct research in a synergetic way.
Prof. **Nicoletta Liguori**, head of the **Photon Harvesting in Plants and Biomolecules** groups at ICFO, was amongst the awardees and will soon recruit a doctoral student to work to identify

and understand the network of proteins and interactions responsible for regulating sunlight harvesting in plants. i¿½By using a combination of state-of-the-art computational methods and capitalizing on a set of collaborations with world experts in the field of computational photochemistry, we will obtain a molecular picture of how solar energy is safely harvested and used by photosynthetic organismsi¿½. This project will contribute to the efforts of the Clean Planet Program at ICFO aimed at pushing the boundaries of our understanding of natural photosynthesis which may in turn facilitate the future design of bio-inspired antenna systems for solar energy conversion.