Education and Culture DG

# EUROPHOTONICS-POESII MASTER COURSE 

## PROPOSAL FOR A MASTER THESIS

Dates: $1^{\text {st }}$ April, 2016-11 ${ }^{\text {th }}$ September, 2016

## Laboratory : ICFO - Molecular NanoPhotonics, Niek van Hulst group City, Country : Castelldefels, Barcelona

Title of the master thesis: WHY DO BIOMOLECULES PRESERVE COHERENCE?
Name of the tutor of the master thesis :
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## Subject:

## Why do biomolecules preserve coherence?

Traditionally, coherence was considered to be a quirk of microscopic objects, atoms, molecules, quantum dots..., in vacuum and at low temperatures.. Now, however, coherence is observed even in macroscopic systems at room temperature: photosynthetic complexes which play a crucial role in the energy storage of nature. How and why are such systems coherent, and does the coherence play a role in the efficiency of energy transfer? Can we learn a lesson for artificial solar cells?
In this project you will assist in addressing individual photosynthetic complexes with ultrafast few fs-lasers. The research combines ultrasensitive confocal microscopy with coherent control and broad band lasers. Thus the project is largely experimental. So we are looking for a student with a good feeling for experimental physics, who likes to work experimentally on the limits of fs and nm experiments.

Keywords : quantum coherence; molecular antennas; energy transfer

## Additional information:

* Required skills: experimental optics; some electronics; affinity with real-time dataacquisition is handy.
* Miscellaneous: a project for students who like to construct their own experiments.

