

PhD POSITION **IN BIO-ENGINEERED PHOTONICS**

Funded by the La Caixa Junior Leader program

PROJECT. Spin transition studies on engineered bio-hybrids for the development of new photonic tools.

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EMPLOYMENT OFFER. 3-year employment contract starting in November 2022 (flexible), with the possibility of an extra year extension.

PROJECT DESCRIPTION. A sustainable future starts with efficient light-energy conversion. In particular, light-induced spin transitions are essential to harness the power of the light in applications like catalysis, light energy storage, or memory development. However, a challenge is still to overcome the energy losses that arise from competing decay paths after photon absorption, making molecular spin transitions inefficient.

This thesis will develop bio-hybrids with customizable spin transitions combining engineered proteins and photoactive molecules. In the lab, we will synthesize bio-hybrids with different structures and study their excited state dynamics using different spectroscopic techniques, including femtosecond transient absorption and time-resolved photoluminescence. This strategy allows to study the light conversion principles and optimize them for the desired application

POSITION PROFILE

- Bachelor of Physics, Physical chemistry, Biophysics, or similar.
- Master in an area related to the position duties, preferably in physical chemistry, biophysics, or Nanoscience.
- High level of English, both oral and written.
- Ability to work in a team.

VALUABLES:

- Experience according to the profile, particularly in time-resolved spectroscopic techniques as transient absorption or photoluminescence measurements.
- Experience in molecular biology, protein purification, and chromatography.

WHAT IS OFFERED FOR THE CANDIDATE. The proposed project will offer the PhD a unique training opportunity at the interface of spectroscopy, physical chemistry, molecular biology, and Nanoscience. Specifically, the proposed project will greatly increase the PhD student's portfolio of scientific know-how on the pump-probe spectroscopic characterization of exciton dynamics in bio-hybrid materials, including data acquisition, analysis, and interpretation. Besides, the candidate will receive training in the fabrication of engineered proteins and bio-hybrids systems, including protein synthesis and purification. We will offer the PhD student a detailed on-the-job introduction, including continuous mentoring through the PhD training. The student will also have the possibility to supervise undergraduate students. We have active collaborations with national and international researchers, which the PhD student and the research project will take advantage of.

RESEARCH ENVIRONMENT. Our group is part of the time-resolved spectroscopy department at IMDEA Nanoscience with a collaborative and international environment. In the department, we have an active seminar program to share and discuss scientific progress having the input of scientists from different areas. Moreover, IMDEA offers a good training program for PhD students with courses on topics such as scientific and technological management, career development, and science communication.

INSTRUCTIONS. Interested candidates must submit **their application before August 31, 2022 to the email sara.hernandez@imdea.org**, including a presentation letter and a CV. A recommendation letter is desirable. Candidates will be called for an online interview.



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